INITIAL STUDY ADDENDUM 1
High Desert Water Bank

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1 INTRODUCTION

In December 2017 the Antelope Valley-East Kern Water Agency (the Agency) adopted a Mitigated Negative Declaration (MND, SCH Number 2017061030) for the High Desert Water Bank (Project or 2017 Original Project Design).

The Project involves the development and operation of a groundwater bank on approximately 1,500 acres of land in the western edges of the Antelope Valley. The project would store State Water Project (SWP) water supplies from the Agency and other banking participants during wet weather year periods when supplies exceed demands and would recover the water for use by the Agency and its partners during dry weather years when demands exceed supplies and other times when there are disruptions to State Water Project supplies. Implementation of this project will require the construction of monitoring and production water wells, turnout(s) from the California Aqueduct, East Branch, underground and above ground pipelines, recharge basins, and water storage and booster pump facilities.

Since the time of the MND adoption, two key events have occurred:

1. Although the overall number of acres and capacity have not changed, various components of the Project design have been optimized.

2. The CEQA Guidelines were revised in late 2019.

This Addendum document compiles the necessary information required to update the Agency's CEQA environmental review process for the Project in accordance with Sections 15162 and 15164 of the State CEQA Guidelines.

2 PROJECT DESCRIPTION

2.1 PROJECT LOCATION

The Agency proposes to build and operate a groundwater recharge and recovery program referenced as the High Desert Water Bank (the Project). The Project will be implemented on an approximately 1,500-acre site in Los Angeles County bounded by:

- Avenue A (Kern / Los Angeles County Line) on the north,
- 300th Street West on the west,
- 280th Street West on the east, and
- The California Aqueduct on the south.

This area is located in Sections 1, 2, 11, and 12 of Township 8 North, Range 17 West, northwest of the community of Neenach. Refer to Figures 2.4-1 and 2.4-2 for the Project location.

The Project area consists of undeveloped and fallowed agricultural land surrounded by the Tehachapi and San Gabriel mountain ranges to the north, south, and west. With the exception of some isolated residential homes within and to the east of the Project area, the nearest residential communities are located ½ mile south and east of the Project area. The Project's southern boundary is the California Aqueduct, East Branch which is a part of the backbone of the State of California's State Water Project (SWP). The California Aqueduct will be the source of water for recharge operations and the point of delivery for return flow operations for the Project. The Project area is also situated south of an existing groundwater bank owned and operated by the Tejon Ranch Corporation. The slope of the land generally falls to the east with an approximately 50-ft drop over a 2-mile section.

2.2 CAPACITY

2017 Original Project Design: Feasibility of the Project was evaluated by the Agency's consultant West Water Research LLC under the Financial Feasibility Assessment of Developing Enterprise Water Bank Capacity at the Far West Site dated March 2017. Based on this assessment, the Agency proposes the implementation of a 280,000-acre feet capacity groundwater bank that will store SWP water from various State Water Contractors and other partnering agencies throughout the State of California including the Agency. The Project proposes to store approximately 70,000 acre feet per year of SWP surface water conveyed to the site via the California Aqueduct, East Branch. Recharge operations are planned during wet weather years when SWP allocations exceed demands. The Agency then proposes to recover 90 percent of the stored water with up to an estimated 70,000 acre feet per year returned during dry and critical weather years when SWP allocations are low or disrupted. The Project would allow the Agency and its partners to rely primarily on the groundwater bank as augmentation source of water during dry weather years or during a disruption of normal water supplies.

2021 Revised Project Design: There is no change in the capacity from the 2017 Original Project Design.

2.3 FACILITIES AND OPERATIONS

In general, water from the SWP would be turned into the bank from an aqueduct turnout facility to be located in the southern portion of the site. The water would travel through a series of bidirectional

pipelines and pump station to the various recharge areas located throughout the bank property. Additionally, within the 1,500 acre area, 322 acres were set aside for habitat management.

Refer to Figure 2.4-3 for the original and proposed aqueduct turnout locations.

Refer to Figures 2.4-4 and 2.4-5 for the recharge, recovery and transmission facilities configuration assumed in the 2017 Original Project Design.

Refer to Figure 2.4-6 for the recharge, recovery and transmission facilities configuration assumed in the 2021 Project Design.

2.3.1 Aqueduct Turnout

2017 Original Project Design: The Agency proposed to construct one new 150 cubic feet per second (cfs) turnout off of the California Aqueduct just east of 300th Street West on the west end of the property, designed to operate via gravity flow, and rehabilitate the existing 50 cfs turnout located just east of 280th Street West, on the east end of the property, intended to be supplementary to the new turnout.

2021 Revised Project Design: Water for recharge operations will be conveyed from the California Aqueduct adjacent to the Project site and distributed to the recharge areas via one new 250 cubic feet per second (cfs) capacity turnout to be located just east of 290th Street West. The existing 50 CFS capacity turnout would not be rehabilitated.

2.3.2 Transmission Facilities

2017 Original Project Design: From the Aqueduct turnouts, water will be conveyed to the different recharge areas of the site with an approximately 3.5 mile combination / bi directional recharge and recovery transmission aboveground pipeline (Main) ranging in size from 36- inch to 70-inch in diameter, and approximately 9.5 miles of underground pipelines. This Main will be constructed with a number of aboveground turnouts that will serve as the point of connection to approximately 8 miles of temporary aboveground piping ranging in size from 12-inch to 48-inch in diameter. Aboveground piping would initially be installed throughout the initial berm construction area and then relocated throughout the remainder of the site as needed to deliver recharge water to the various low earthen berm recharge basins. The 3.5 miles of aboveground line would be required to be re-established after significant storm flow events from Oso Creek or Pescado Creek.

2021 Revised Project Design: From the Aqueduct turnout, water will be conveyed to the different areas of the site with an approximately 11.5 mile combination / bi directional recharge and recovery transmission underground pipeline (Main) ranging in size from 36- inch to 96-inch in diameter. This Main will be constructed with a series of lateral pipelines ranging from 24-inch to 48-inch in diameter that will convey water to various recharge basins throughout the project site. Water will be delivered to each recharge basin through a permanent turnout structure that will control and measure flows into each recharge basin.

2.3.3 Recharge Facilities

Recharge operations would occur when SWP water is available from the Agency and its partner's SWP allocations.

The Agency will work with DWR in order for this added flow to be delivered. In such a demand condition, DWR will need to have the Alamo Powerplant or the Cottonwood Chute Bypass in operation in order to balance the water demand in the aqueduct without exceeding the 2 ft per day aqueduct level drawdown criteria. The added demand condition will not be able to be met by DWR if either the Alamo Powerplant and or the Cottonwood Chutte Bypass are out of service. During operation of the bank, the Agency will submit daily water demand forecasts to DWR. The Agency will include provisions for DWR to have SCADA control over the turnout for monitoring and shutdown abilities.

2017 Original Project Design: Of the 1,500 acres, approximately 1,200 would be used for recharge, with an average of 400 acres utilized for inundation over 12 months in years when supply exceeds demand. The 400 acres of inundation would either be in various areas throughout the 1,200 acre property or in one larger area. The areas of inundation would vary annually as needed. The Agency proposed to construct low earthen berms (approximately 3 feet high) that will be placed on average at approximately 300 foot intervals throughout the site resulting in approximately 40 miles of berm construction. The 2017 MND identified that recharge would typically occur by spreading water over approximately 1,200 acres of the property by flooding, similar to flood irrigation agricultural operations where water is distributed throughout the recharging basins using shallow low earthen berms to slow the flow of water and therefore promote infiltration. Refer to Figures 2.4-4 and 2.4-5 for the original project design. Stormwater flooding events would be allowed to flow over the berms and therefore require the reconstruction of the berms after significant storms.

The proposed recharge operations of 70,000 acre feet per year were proposed for year round operations, at an assumed recharge infiltration rate of 0.5-foot per day.

2021 Revised Project Design: Of the 1,500 acres, approximately 890 acres would be used for recharge through a series of 42 engineered fill berms that are 6 feet high with concrete spillways located in the northern and southern portions of the bank property. Low, earthen berms would be located in the Pescado Creek floodway and along the southerly fringe of Oso Canyon floodway providing additional recharge capacity for the overall project. Recharge water from the SWP will be distributed into the recharge basins through a permanent network of underground conveyance systems. Each recharge basin will have local discharge control and flow metering in order to manage the overall recharging operational for the High Desert Water Bank. Some basin berms, such as those parallel to Avenue A-8, rip-rap will be used to protect constructed infrastructure from damage associated with the 100-year flood event.

The proposed recharge operations of 70,000 acre feet per year would operate over approximately nine months, an assuming a recharge infiltration rate of 0.50 foot per day.

During recharge operations, it is anticipated that a 100 cfs pump station will operate continuously.

2.3.4 Recovery Facilities

The Agency proposes to recover the groundwater year-round during dry weather years or at any other times when the Agency's groundwater banking participants call for water stored at the Project site to be recovered and delivered to the requesting partner.

2017 Original Project Design: Recovery would occur by the use of 18 new groundwater extraction wells designed at approximately 2,500 gallons per minute (gpm) each that will deliver the recovered water back to the California Aqueduct. During wet years with recharge operations, the power usage will be zero. During dry years with recovery operations, wells and pump station may be running continuously.

Operation of the bank would require one full time operator and assistant on site. The operator and assistant would travel daily with an assumed light duty (250 hp) pickup truck, 100 miles per day for operations. There would also be the need for additional staff to assist with berm construction and pipe relocations operations on a periodic basis. This crew is anticipated to travel in one light duty (250 hp) pickup truck with trailer, 100 miles per day, 5 days every four months.

2021 Revised Project Design: Recovery operations will be accomplished with the use of approximately 28 groundwater recovery wells designed with capacities ranging from approximately 1,800 to 2,200 gpm each delivering recovered water back to the California Aqueduct. During recovery operations, wells will be running continuously.

Operation of the bank would require one full time operator and assistant on site. The operator and assistant would travel daily with an assumed light duty (250 hp) pickup truck, 100 miles per day for operations.

2.3.5 Monitoring Wells

2017 Original Project Design: Currently, the site has about 10 existing wells that the Agency can utilize to monitor the groundwater level. The majority of these wells are inactive. The active wells would continue to operate under existing conditions. The Agency does not anticipate changing the use of these wells.

The Agency proposes to construct 5 new monitoring wells as part of the Project. These wells will be drilled approximately 500 feet deep and constructed with 5-inch well casing.

2021 Revised Project Design: There is no change to the monitoring well use or configuration, or number of new monitoring wells proposed to be drilled.

2.3.6 Booster Pump Station / Storage / Maintenance Facilities

2017 Original Project Design: The Agency proposed to construct a 150 CFS booster pump station and 250,000-gallon storage tank. The site will also house some maintenance facilities incorporated onto the new pump station building.

2021 Revised Project Design: The Agency proposes to construct a 100 CFS booster pump station only (no storage tank). The site will also house some maintenance facilities incorporated onto the pump station site. The proposed pump station will be designed to operate outdoors without any pump station building.

All electrical and controls will be located inside weather-resistant electrical cabinets under a new shade structure.

2.3.7 Conservation/Habitat Management

The Agency proposes to leave approximately 322 acres of the 1,500 acre Project site for habitat management/conservation purposes although no conservation easement or third-party management is proposed or required. The land set-aside was required in the 2017 MND to minimize potential impacts to biological resources including plant and wildlife species as well as wetlands and drainages.

2017 Original Project Design: Refer to Figure 2.4-7 for a map of the land proposed for habitat management with the 2017 Original Project Design.

2021 Revised Project Design: Refer to Figure 2.4-8 for a map of the land proposed for habitat management under the 2021 Revised Project Design. The location of the lands has been modified although the acreage remains the same.

Table 2.3-1: Design Comparison

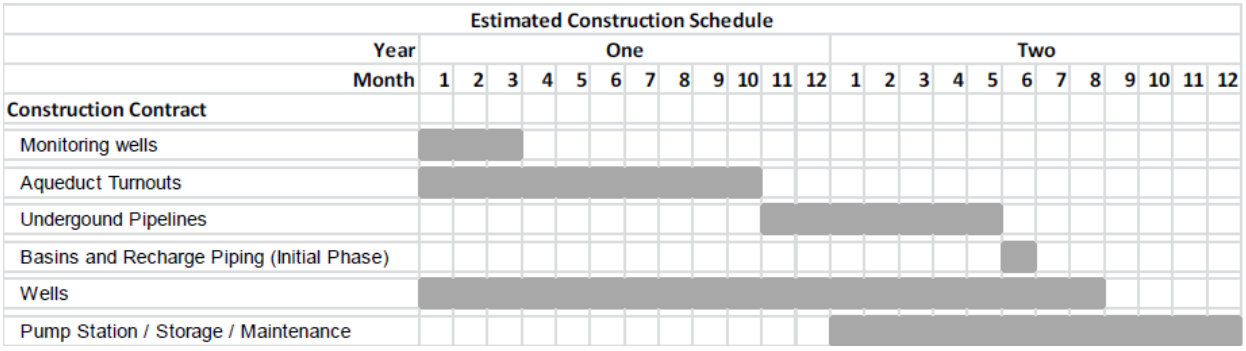
Feature	2017 Original Project Design	2021 Revised Project Design
Capacity	280,000 AF groundwater Bank 70,000 AF/Yr Recharge/Recovery	No change
Aqueduct Turnout	1 new 150 cfs; rehab existing	1 new 250 cfs; no rehab of existing
Recharge Facilities	1,200 acres low earthen berms with 400 acres inundated annually, rotating throughout site; berms designed to be sacrificial during large storm events and reconstructed.	890 acres consisting of 42 engineered and flood-protected basins defined by engineered, compacted berms, with 890 acres available for use annually, with 890 acres anticipated to be inundated over eight months.
Recovery Facilities	18 (2,500 gpm each)	28 (1,800 to 2,200 gpm each)
Transmission Facilities	Above ground: 3.5 miles Below ground: 9.5 miles	Above ground: 0 Below ground: 11.5 miles
Monitoring Wells	5	No change
Pump Station and pump station building, storage tank	Included	Storage tank or Pump Station Building no longer required
Habitat Management Lands	322 Acres	No change to acreage; location change only

2.4 CONSTRUCTION

2.4.1 Overall Estimated Schedule

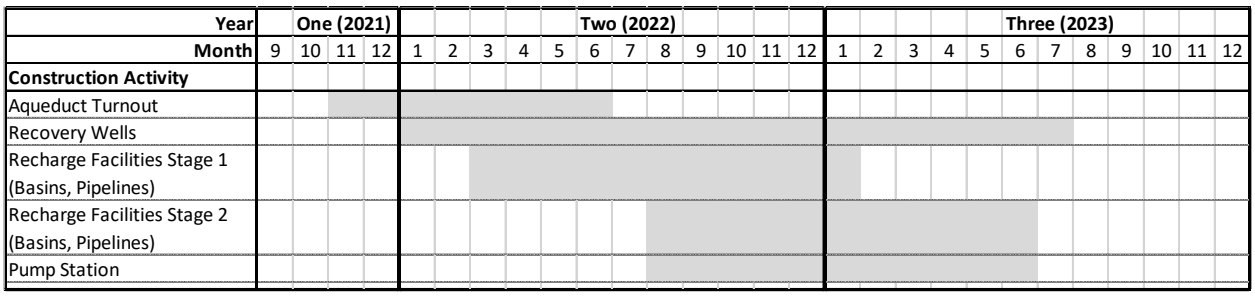
2017 Original Project Design: Construction is anticipated to be continuous for a period of approximately 2 years, beginning in January of Year 1 and ending in December of Year 2.

The 2017 MND identified the following estimated schedule:



2021 Revised Project Design: The construction will occur over approximately 2.5 calendar years, ending approximately December 2023. However, most of the site construction and development will occur over 21 months.

The estimated schedule for the 2021 Revised project Design is anticipated as follows:



2.4.2 Aqueduct Turnout

2017 Original Project Design: Construction for the new turnout will be located on the southwestern and southeastern boundary of the Project site and is anticipated to disturb about 6 acres of land. Construction operations will include installation of the turnout bay within the Aqueduct, underground piping, a metering building, and all associated electrical, mechanical, and instrumentation equipment. Earthwork for this phase of construction is estimated at 250 cubic yards with no import or export material anticipated. Construction operations are anticipated to last about 10 months.

2021 Revised Project Design: There is no change to the construction scenario for the new aqueduct turnout.

Table 2.4-1: Aqueduct Turnout Assumption Comparison

2017 Original Project Design	2021 Revised Project Design
1 crane (190 hp, 6 hours per day)	No change
1 hydraulic excavator (180 hp, 6 hours per day)	No change
1 backhoe (108 hp, 5 hours per day)	No change
1 roller compactor (114 hp, 4 hours per day)	No change
1 wheeled loader (165 hp, 6 hour per day)	No change
1 water truck (200 hp, 4 hours per day)	No change
Approx Total AC disturbance: **6 AC**	Approx Total AC disturbance: **No change**
Estimated Construct Time: 10 months	Estimated Construct Time: No change

Note: This table represents a reasonable assumption based on standard construction methods. Actual equipment and hours may vary depending on site conditions.

2.4.3 Transmission Facilities

2017 Original Project Design:

- Above ground pipelines: Installation of the aboveground piping would consist of the delivery of pipe to the site with a truck and deposited along the sides of the recharge basins for hand installation. Installation of this piping will be continuous as recharge operations are cycled from one area of the site to another.

- Below ground pipelines: The 9.5 miles of underground pipelines would be laid in a trench about 6 to 11 feet deep at the bottom (4-foot pipe cover), with side slopes of about 1.5 to 1 for trench safety and stability, or vertical sides if properly shored. Given an average bottom width of 6 feet, the width of the trench at ground level would not be more than about 20 feet. Excavation would involve removal of about 100 cubic feet of soil per linear foot of trench. A stockpile would be maintained along the pipeline alignment. Pipeline may be installed at a rate of about 400 feet per day. The daily work area would be approximately 500 feet long by 60 feet wide, although not all of this area would be disturbed continuously. Excess spoil from excavation operations may be used to provide a low exterior berm along the Project site or spread over the construction area and thus will not be hauled off site. Earthwork for this phase of construction is estimated at 1,200 cubic yards. Pipeline installation operations are estimated to take place over a period of about 7 months.

2021 Revised Project Design:

- Above ground pipelines: There are no above ground pipelines.

- Below ground pipelines: The 11.5 miles of underground pipelines would be laid in a trench about 6 to 12 feet deep at the bottom (4-foot pipe cover), with side slopes of about 1.5 to 1 for trench safety and stability, or vertical sides if properly shored. Given an average bottom width of 6 feet, the width of the trench at ground level would not be more than about 20 feet. Excavation would involve removal of about 100 cubic feet of soil per linear foot of trench. A stockpile would be maintained along the pipeline alignment. Pipeline may be installed at a rate of about 400 feet per

day. The daily work area would be approximately 500 feet long by 60 feet wide, although not all of this area would be disturbed continuously. Excess spoil from excavation operations will incorporated into the recharge basin berms and thus will not be hauled off site. Earthwork for this phase of construction is estimated at 351,000 cubic yards. Pipeline installation operations are estimated to take place over a period of about 12 months.

Table 2.4-2: Transmission :Facility Construction Assumption Comparison

2017 Original Project Design	2021 Revised Project Design
1 crane (190 hp, 2 hours per day)	2 cranes (190 hp, 2 hours per day)
1 hydraulic excavator (180 hp, 6 hours per day)	2 hydraulic excavators (180 hp, 6 hours per day)
1 grader (174 hp, 6 hours per day)	2 graders (174 hp, 6 hours per day)
1 off-highway truck (479 hp, 4 hours per day)	1 off-highway truck (479 hp, 4 hours per day)
2 water trucks (200 hp, 4 hours per day)	2 water trucks (200 hp, 4 hours per day)
1 belly scraper (313 hp, 4 hours per day)	3 belly scrapers (313 hp, 4 hours per day)
2 wheeled loaders (165 hp, 8 hours per day)	2 wheeled loaders (165 hp, 8 hours per day)
1 skip loader (88 hp, 3 hours per day)	1 skip loader (88 hp, 3 hours per day)
2 backhoes (108 hp, 5 hours per day)	4 backhoes (108 hp, 5 hours per day)
Approx Total Acres disturbance: 9.5 miles x 20 ft wide = **23 AC** Estimated Construct Time: 10 months	Approx Total Acres disturbance: 11.5 miles x 20 ft wide = **27 AC** Estimated Construct Time: 12

Note: This table represents a reasonable assumption based on standard construction methods. Actual equipment and hours may vary depending on site conditions.

2.4.4 Recharge Facilities

2017 Original Project Design: The Agency proposed to construct low earthen berms that would be placed on average at approximately 300-foot intervals throughout the site resulting in approximately 40 miles of berm construction. The total area disturbed would be at maximum about 1,200 acres. The Agency would initially construct about 400 acres of recharge basins with work expected to last about 4 weeks. After the initial construction is complete, the remainder of recharge basin construction will be continuous as recharge operations are cycled throughout the site. Construction operations for these basins would mainly consist of pushing dirt with a tractor or backhoe to create the low earthen berms along the existing contour lines and are typical to agricultural operations. Berms will not be large enough to drive on. To keep dust down, native plants will be allowed to propagate in and around the basins and berms. This vegetation will minimize dust potential. During recharge operations, the soil will be wet. During non-recharge operations, the conditions are no different than they are now (fallowed undeveloped land).

2021 Revised Project Design: The Agency proposed to construct 42 earthen berms with an average height of 6 feet high. The total area disturbed would be at maximum about 890 acres. The Agency would initially construct about 400 acres of recharge basins within the southerly portion of the project site with work expected to last about 18 weeks. After the initial construction is complete, the remainder of recharge basin construction will be continuous until all the remaining basins and control structures are completed. Construction operations for these basins would mainly consist of excavating and constructing engineered berms along existing contour lines forming the recharge basin complex. Berms will be suitable for maintenance vehicle access. To keep dust down, native plants will be allowed to propagate in and around

the basins and berms. This vegetation will minimize dust potential. During recharge operations, the soil will be wet. During non-recharge operations, the conditions are no different than they are now (fallowed undeveloped land).

Table 2.4-3: Recharge Facility Construction Assumption Comparison

2017 Original Project Design	2021 Revised Project Design
2 backhoes (108 hp, 5 hours per day)	2 backhoes (108 hp, 5 hours per day)
	1 hydraulic excavator (180 hp, 6 hours per day)
	2 graders (174 hp, 6 hours per day)
	2 off-highway truck (479 hp, 4 hours per day)
	2 water trucks (200 hp, 4 hours per day)
	6 belly scrapers (313 hp, 6 hours per day)
	2 wheeled loaders (165 hp, 6 hours per day)
	2 skip loaders (88 hp, 3 hours per day)
Approx Total Acres disturbance: **1,200 AC** Estimated Construct Time: 10 months Initial 6 months continuously to re-establish as needed	Approx Total Acres disturbance: **890 AC** Estimated Construct Time: 12 months Initial

Note: This table represents a reasonable assumption based on standard construction methods. Actual equipment and hours may vary depending on site conditions.

2.4.5 Recovery/Extraction Facilities

2017 Original Project Design: For the 18 extraction wells to be drilled to approximately 500 feet, construction would include grading to level a 100 by 100-foot drilling pad area, well drilling and construction, well site fencing, overflow basins, well piping, well equipment installation including the pump, motors, and all associated electrical, mechanical, and instrumentation equipment. A typical 16-inch well may yield about 90 cubic yards of drilling spoil, which will be spread on site over an area of about 0.05 acre. Well facilities would be operated with electrical power and would not emit criteria pollutants.

2021 Revised Project Design: For the 28 extraction wells to be drilled ranging from 600 feet to 1,200 feet, construction would be the same as previously identified.

Table 2.4-4: Recovery Facilities Construction Assumption Comparison

2017 Original Project Design	2021 Revised Project Design
1 drilling rig (500 HP, 24 hrs per day for 90 days)	2 drilling rigs (500 HP, 24 hrs per day for 90 days)
1 hydraulic excavator (180 hp, 6 hours per day)	2 hydraulic excavators (180 hp, 6 hours per day)
1 grader (174 hp, 6 hours per day)	2 off-highway trucks (479 hp, 4 hours per day)
1 off-highway truck (479 hp, 4 hours per day)	2 wheeled loaders (313 hp; 1 hour per day)
1 small roller compactor (114 hp, 1 hour per day)	1 water truck (200 hp, 1 hour per day)
1 skip loader (88 hp, 1 hour per day)	2 Test pumps (200 hp, 60 hrs per well)
1 wheeled loader (313 hp; 1 hour per day)	2 skip loaders (88 hp, 1 hour per day)
1 water truck (200 hp, 1 hour per day)	2 small roller compactors (114 hp, 1 hour per day)
Test pump (200 hp, 60 hrs per well)	2 graders (174 hp, 6 hours per day)
Approx Total Acres disturbance: 100 x 100 pad x 18 pads = **4.13 AC**	Approx Total Acres disturbance: 100 x 100 pad x 28 pads = **6.5 AC**
Estimated Construct Time: 12 months	Estimated Construct Time: 30 months

Note: This table represents a reasonable assumption based on standard construction methods. Actual equipment and hours may vary depending on site conditions.

2.4.6 Monitoring Wells

2017 Original Project Design: The Agency proposed to construct 5 monitoring wells, approximately 500 feet deep with 5-inch well casing. Work for these wells is anticipated to take about 12 weeks. Construction operations include grading to level a 40 x 40-foot drilling pad area, a standard drilling rig on site, a sand-bagged area to receive drilling spoil and reduce runoff, and grading equipment to spread the wet drilling spoil. A typical well may yield about 10 cubic yards of drilling spoil, which will be spread on site over an area of about 0.02 acre. After completion, these wells will be sampled and tested to determine local groundwater quality and the specific yield of the well.

2021 Revised Project Design: There is no change in the number or size of wells, construction methods or timing.

Table 2.4-5: Monitoring Well Construction Assumption Comparison

2017 Original Project Design	2021 Revised Project Design
1 drilling rig (500 HP, 8 hrs per day for 20 days)	No change
1 small roller compactor (114 hp, 1 hour per day)	No change
1 skip loader (88 hp, 1 hour per day)	No change
1 wheeled loader (313 hp; 1 hour per day)	No change
1 water truck (200 hp, 1 hour per day)	No change
Test pump (10 hp, 12 hrs per well)	No change
Approx Total Acres disturbance: 0.02 AC each x 5 wells = **0.1 AC** Estimated Construct Time: 3 months	Approx Total Acres disturbance: **No change** Estimated Construct Time: No Change

Note: This table represents a reasonable assumption based on standard construction methods. Actual equipment and hours may vary depending on site conditions.

2.4.7 Booster Pump Station / Storage / Maintenance Facilities

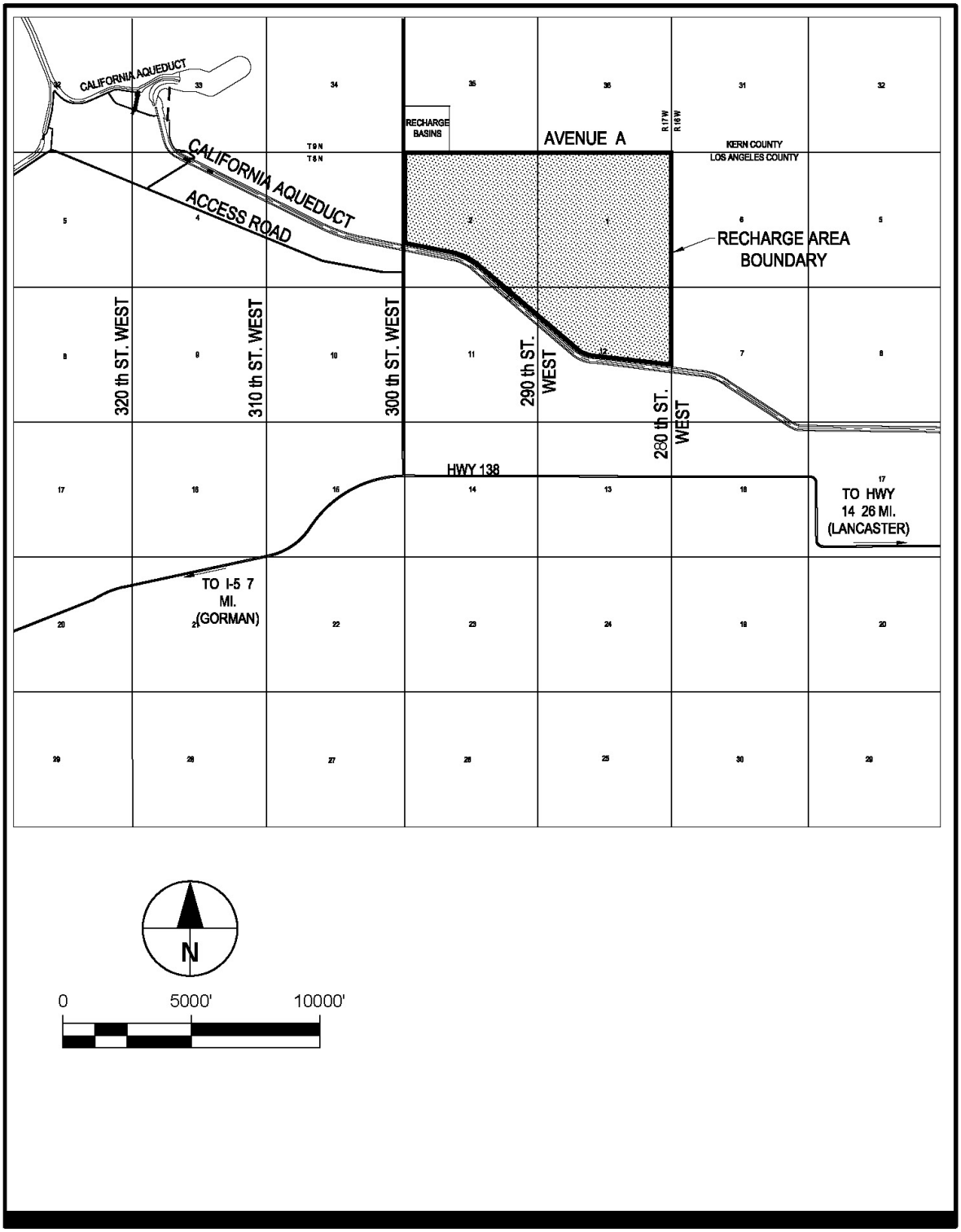
2017 Original Project Design: A booster pump station, maintenance building and storage tank would be built on about a 2-acre site adjacent to the California Aqueduct with gravel parking pads. Construction work would consist of initial site grading and earthwork, piping installation, concrete foundation work, building construction including mechanical, electrical, plumbing, and instrumentation, and installation of the storage tank. Booster pump facilities would be operated with electrical power and would not emit criteria pollutants. The storage tank was proposed to be between 24 and 32 feet high. Construction are anticipated to take about 12 months.

2021 Revised Project Design: The booster pump and maintenance facilities will be built near the center of the project site. All aspects are the same as the 2017 Original Project Design, except that the storage tank would not be constructed.

Table 2.4-6: Booster Pump Station/Storage/Maintenance Construction Assumption Comparison

2017 Original Project Design	2021 Revised Project Design
1 crane (190 hp, 6 hours per day)	No Change
1 hydraulic excavator (180 hp, 6 hours per day)	No Change
1 grader (174 hp, 6 hours per day)	No Change
1 off-highway truck (479 hp, 4 hours per day)	No Change
1 water truck (200 hp, 4 hours per day)	No Change
1 belly scraper (313 hp, 4 hours per day)	No Change
1 wheeled loader (165 hp, 8 hours per day)	No Change
1 roller (114 hp, 3 hours per day)	No Change
2 backhoes (108 hp, 5 hours per day)	No Change
1 skip loader (88 hp, 1 hour per day)	No Change
Welder (25 hp, 8 hours per day)	No Change
Air compressor for sandblasting and coating (25 hp, 8 hours per day)	No Change
Approx Total AC disturbance: **2 AC** Estimated Construct Time: 3 months	Approx Total AC disturbance: **No Change** Estimated Construct Time: No Change

Note: This table represents a reasonable assumption based on standard construction methods. Actual equipment and hours may vary depending on site conditions.

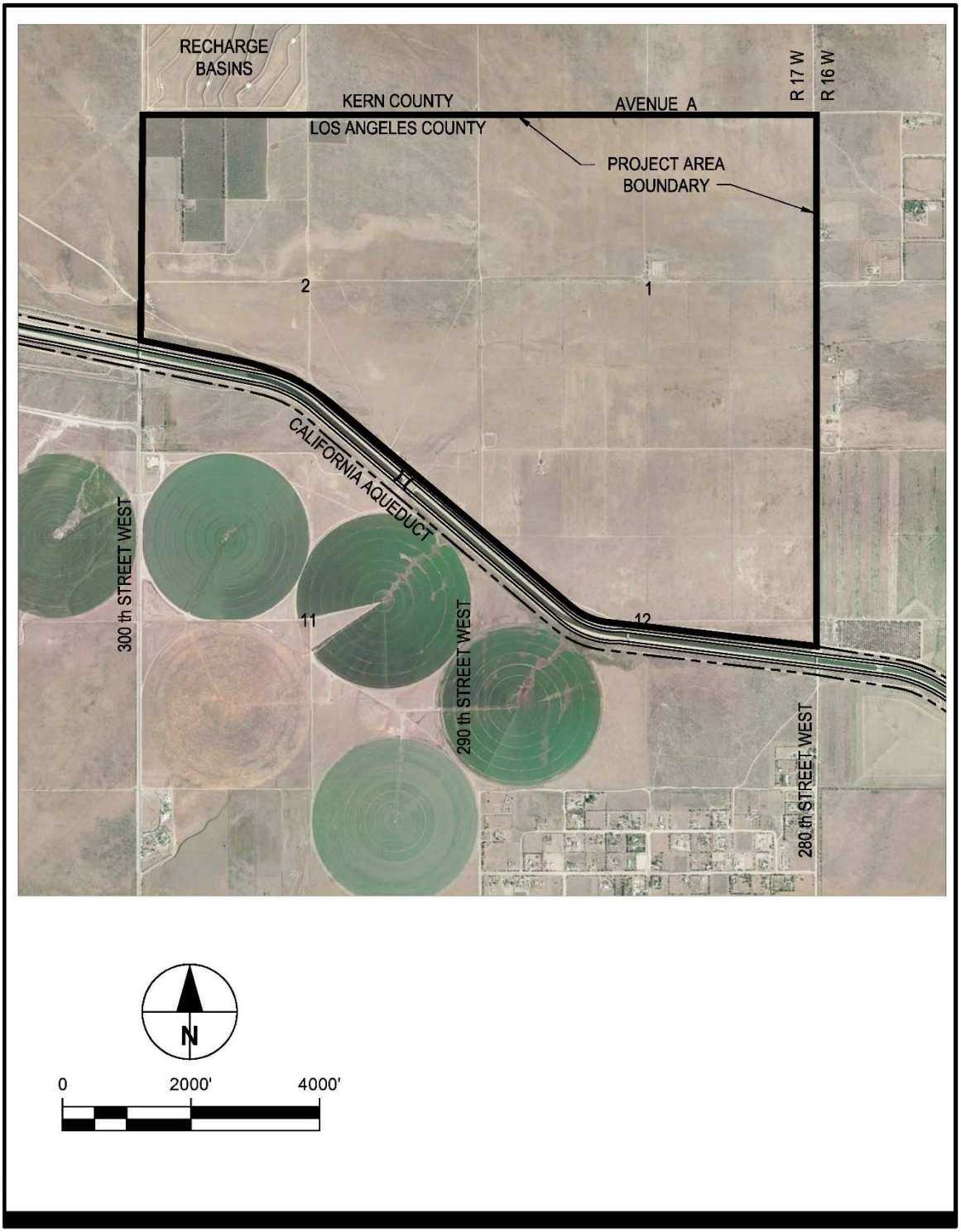


ANTELOPE VALLEY-EAST KERN WATER AGENCY
HIGH DESERT WATER BANK
VICINITY MAP
60537613

AECOM

FIGURE 1A

Figure 2.4-1: Site Location - Schematic
Initial Study Addendum 1
High Desert Water Bank



ANTELOPE VALLEY-EAST KERN WATER AGENCY
HIGH DESERT WATER BANK
AERIAL VICINITY MAP
60537613

AECOM

FIGURE 1B

Figure 2.4-2: Site Location - Aerial
Initial Study Addendum 1
High Desert Water Bank

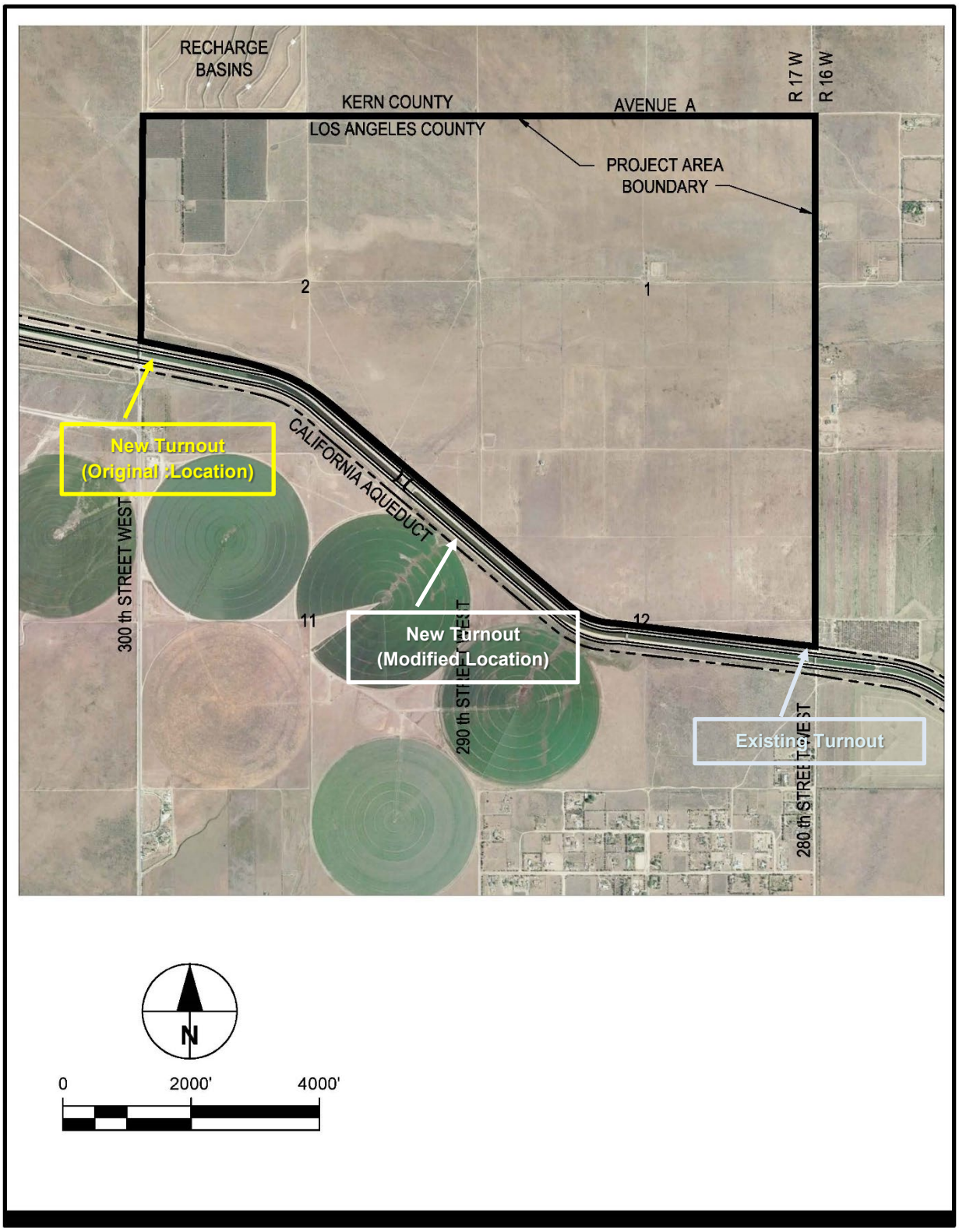


Figure 2.4-3: Aqueduct Locations
Initial Study Addendum 1
High Desert Water Bank

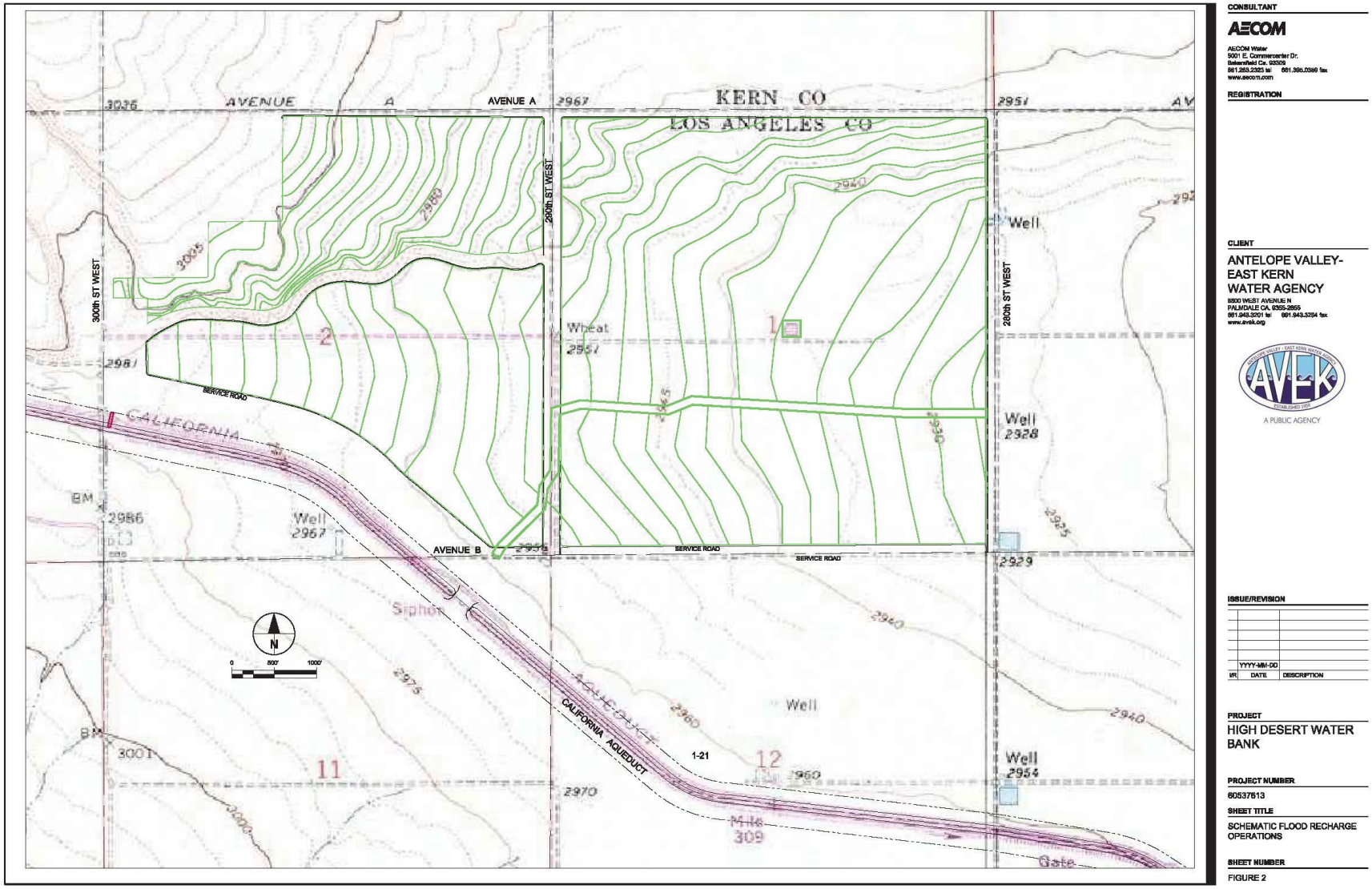


Figure 2.4-4: Recharge Area – 2017 Original Design

Initial Study Addendum 1
High Desert Water Bank

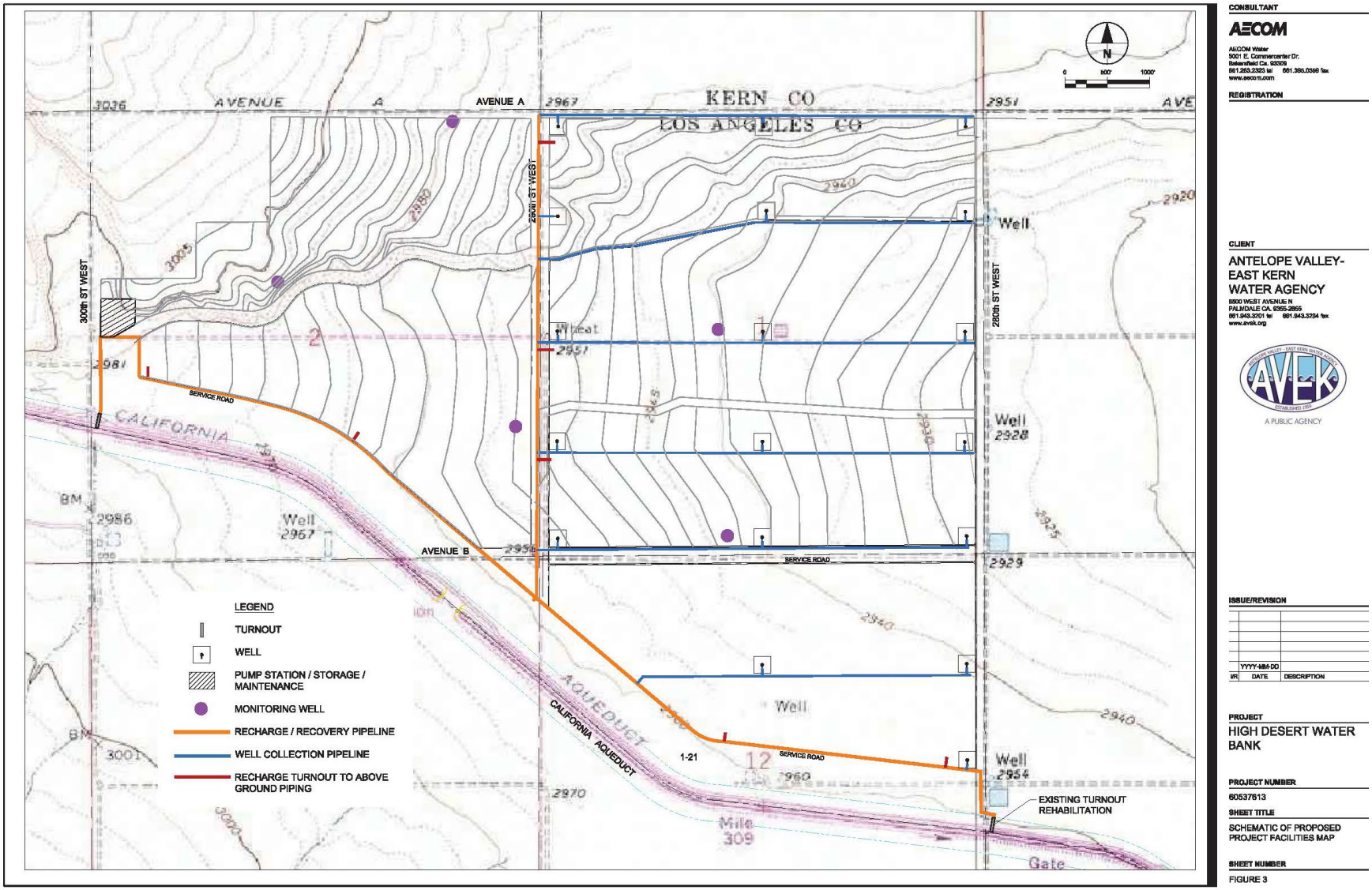
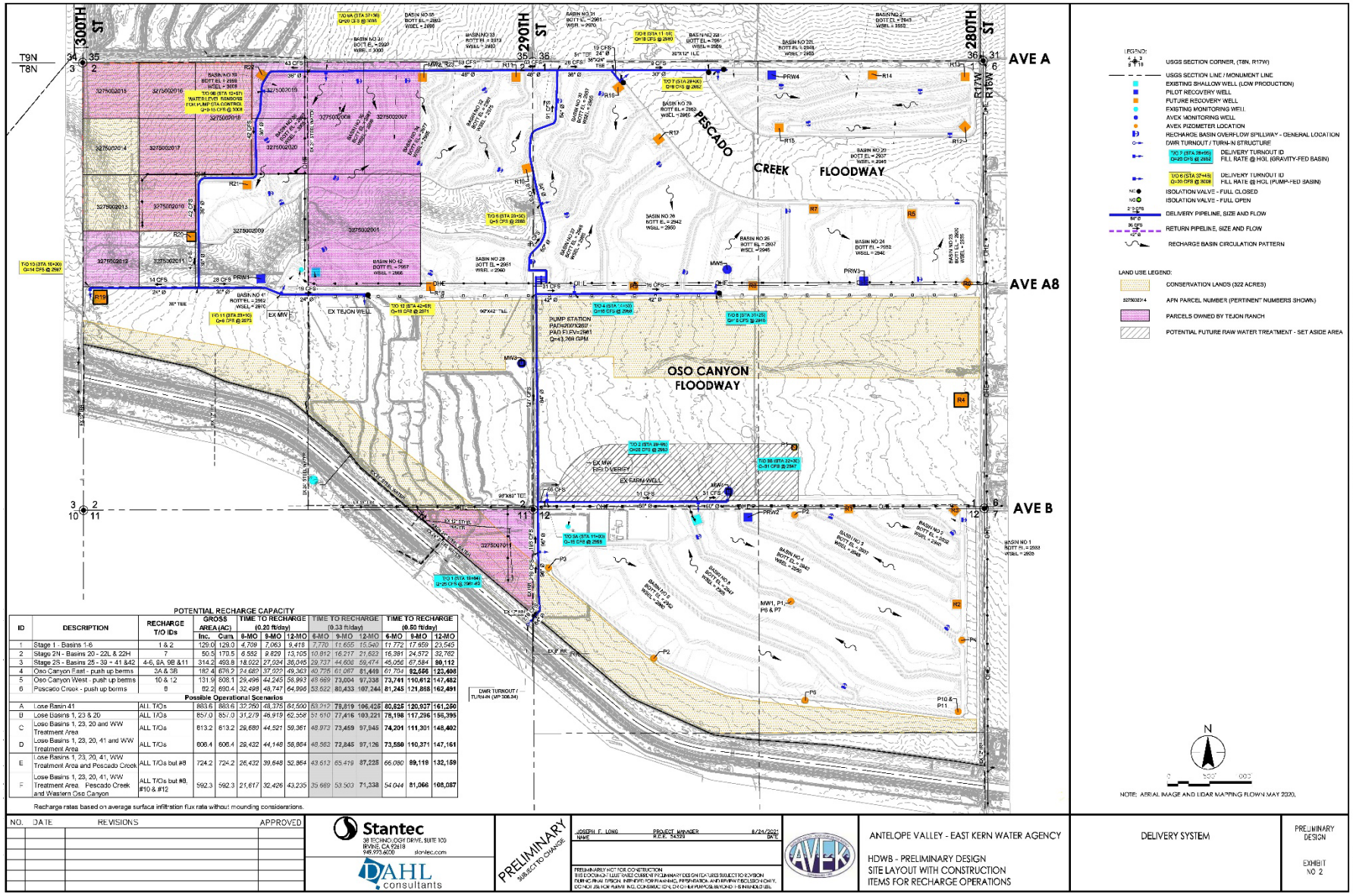


Figure 2.4-5: Recharge Facilities – 2017 Original Design

Initial Study Addendum 1
High Desert Water Bank



POTENTIAL RECHARGE CAPACITY

ID	DESCRIPTION	RECHARGE T/O IDs	GROSS AREA (AC) Inc.	GROSS AREA (AC) Cum	TIME TO RECHARGE (0.20 ft/day) 6-MO	9-MO	12-MO	TIME TO RECHARGE (0.33 ft/day) 6-MO	9-MO	12-MO	TIME TO RECHARGE (0.50 ft/day) 6-MO	9-MO	12-MO
1	Stage 1 - Basins 1-6	1 & 2	129.0	129.0	4,709	7,063	9,418	7,770	11,655	15,540	11,772	17,659	23,545
2	Stage 2N - Basins 20 - 22L & 22H	7	50.5	179.5	6,552	9,829	13,105	10,812	16,217	21,623	16,381	24,572	32,762
3	Stage 2S - Basins 25 - 39 - 41 &42	4-6, 9A, 9B &11	314.2	493.8	18,022	27,034	36,045	29,737	44,606	59,474	45,056	67,584	**90,112**
4	Oso Canyon East - push up berms	3A & 3B	182.4	676.2	24,682	37,022	49,363	40,725	61,087	81,449	61,704	**92,556**	**123,408**
5	Oso Canyon West - push up berms	10 & 12	131.9	808.1	29,496	44,245	58,993	48,669	73,004	97,338	**73,741**	**110,612**	**147,482**
6	Pescado Creek - push up berms	8	82.2	890.4	32,498	48,747	64,996	53,622	80,433	107,244	**81,245**	**121,868**	**162,491**
	Possible Operational Scenarios												
A	Lose Basin 41	ALL T/Os	883.6	883.6	32,250	48,375	64,500	53,212	79,819	106,425	**80,625**	**120,937**	**161,250**
B	Lose Basins 1, 23 & 20	ALL T/Os	857.0	857.0	31,279	46,919	62,558	51,610	77,416	103,221	**78,198**	**117,296**	**156,395**
C	Lose Basins 1, 23, 20 and WW Treatment Area	ALL T/Os	813.2	813.2	29,680	44,521	59,361	48,973	73,459	97,945	**74,201**	**111,301**	**148,402**
D	Lose Basins 1, 23, 20, 41 and WW Treatment Area	ALL T/Os	806.4	806.4	29,432	44,148	58,864	48,563	72,845	97,126	**73,580**	**110,371**	**147,161**
E	Lose Basins 1, 23, 20, 41, WW Treatment Area and Pescado Creek	ALL T/Os but #8	724.2	724.2	26,432	39,648	52,864	43,613	65,419	87,225	66,080	**99,119**	**132,159**
F	Lose Basins 1, 23, 20, 41, WW Treatment Area. Pescado Creek and Western Oso Canyon	ALL T/Os but #8, #10 & #12	592.3	592.3	21,617	32,426	43,235	35,669	53,503	71,338	54,044	**81,066**	**108,087**

Recharge rates based on average surface infiltration flux rate without mounding considerations.

Figure 2.4-6: Recharge Facilities – 2021 Revised Design

Initial Study Addendum 1
High Desert Water Bank

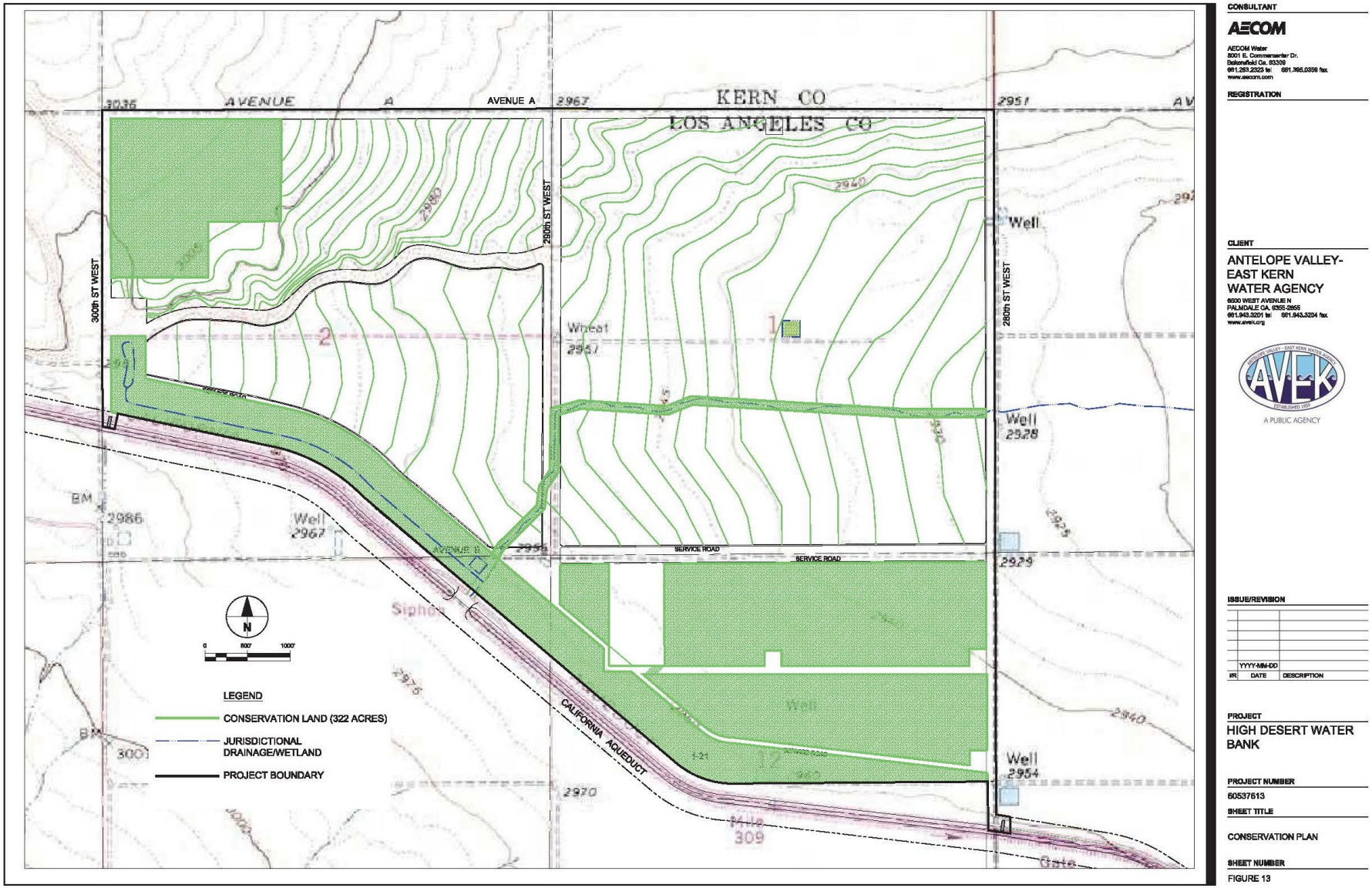


Figure 2.4-7: Habitat Lands – 2017 Original Design

Initial Study Addendum 1
High Desert Water Bank

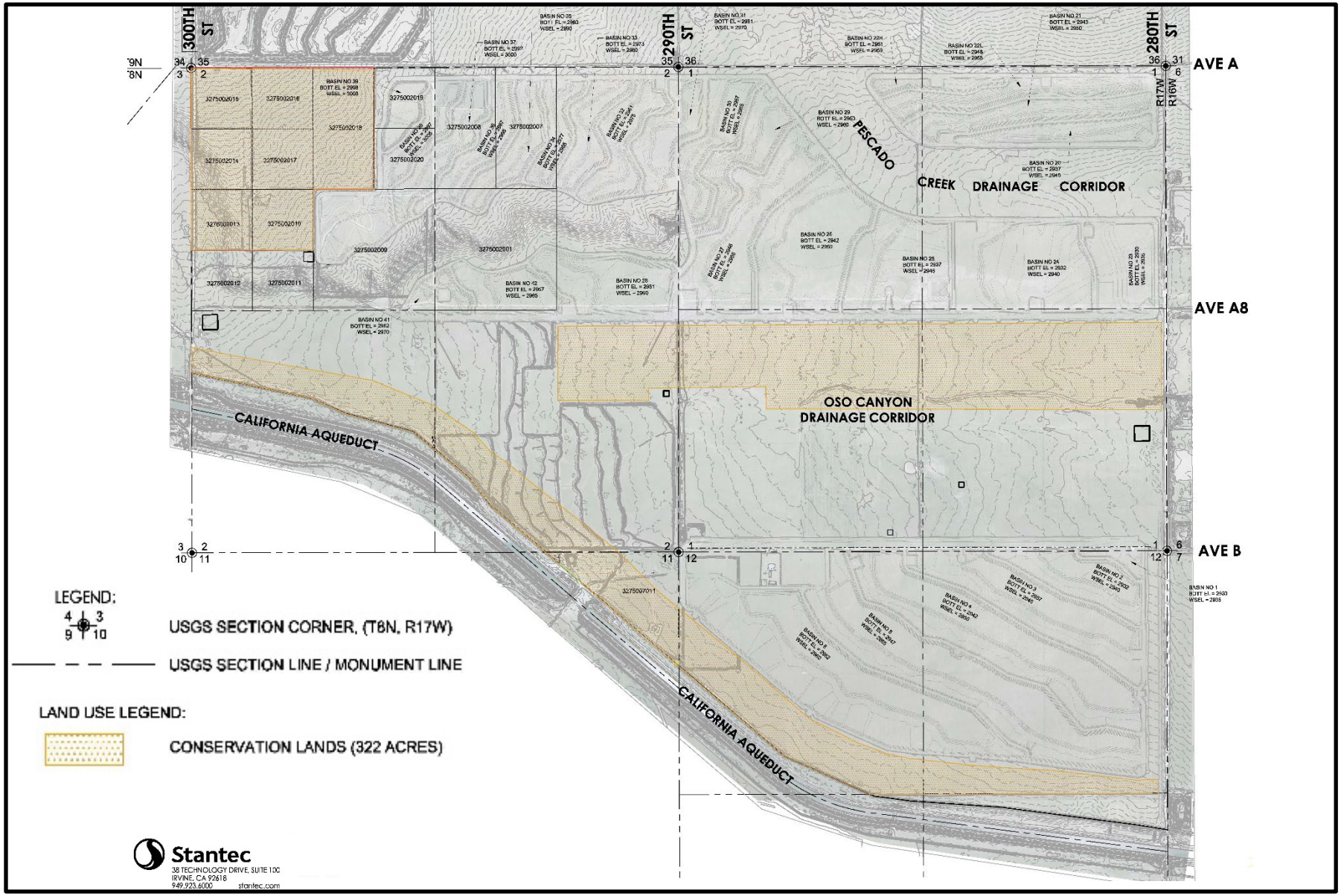


Figure 2.4-8: Habitat Lands – 2021 Revised Design

Initial Study Addendum 1
High Desert Water Bank

3 ENVIRONMENTAL REVIEW PROCESS

3.1 SUMMARY OF PROJECT REVISIONS

A comparison of the 2017 Project Design and the 2021 Project Design is provided in Table 2.3-1. Based on the design changes and construction, the key considerations for environmental review include:

- Only 890 acres of land would be disturbed, instead of 1,200 acres as with the original design.

- A series of 42 basins defined by engineered, compacted berms would be constructed, with spillways to direct flow into each of the basins. Some of the dry sides of the basin walls would be reinforced with rip rap as needed to protect from storm flows. The former design would have constructed low (3-foot-high) berms throughout the 1,200 acres designed to be destroyed during storm events and reconstructed after storm events.

- Inundation/recharge would occur within each of the 42 basins simultaneously (890 acres), or in as many basins are needed to store the excess supply. The original design would have provided for inundation/recharge in 400 acres for 12 months, rotating the areas of inundation as needed over the 1,200 acres.

- All pipelines would be underground, instead of a combination of underground and above ground. Overall the length of the pipelines are approximately the same at approximately 11.5 miles of pipeline. The locations of the pipelines have also changed dur to the design change.

- The number of recovery/extraction wells increased from 18 to 28.

- The number of recovery/extraction wells increased from 18 to 28, although the recovery rate/power of all the new wells would be reduced from approximately 2,500 gpm to approximately 1,800 to 2,200 gpm. And while the overall power consumption would be greater, the infrastructure that would be necessary to provide power under the original design is the same as what would be required for the revised design.

- The areas set aside for habitat management has changed, but the acres did not change. The areas for habitat management now primarily consist of the area within the Oso Canyon floodway and a strip of land adjacent to the Aqueduct, and a small area in the northwestern portion of the site. The habitat management set aside area in the northwestern portion of the site, which consisted of fallow orchards, has been reduced. The habitat management set aside area in the southeastern portion of the site has been removed, and now will be used for recharge basins. In the original Project design, the area in the southeastern portion of the site would have also been developed with soft berms and used in the inundation rotation cycle.

Table 3.1-1: Design Comparison

Feature	2017 Original Project Design	2021 Revised Project Design
Capacity	280,000 AF GW Bank 70,000 AF/Yr Storage/Recharge	No change
Aqueduct Turnout	1 new 150 cfs; rehab existing	1 new 250 cfs; no rehab of existing
Recharge Facilities	1,200 acres soft berms with 400 acres inundated annually, rotating throughout site; berms designed to removed during large storm events and reconstructed.	890 acres with water recharge contained within 42 engineered and protected basins defined by engineered, compacted berms, with 890 acres available for use annually.
Recovery Facilities	18 (2,500 gpm each)	28 (1,800 to 2,200 gpm each)
Transmission Facilities	Above ground: 3.5 miles Below ground: 9.5 miles	Above ground: 0 Below ground: 11.5 miles
Monitoring Wells	5	No change
Pump Station, water tank, maintenance	Included	Storage tank or Pump Station Building no longer required
Habitat Management Lands	322 Acres	No change to acreage; location change only

3.2 REGULATORY FRAMEWORK

In December 2017 the Agency adopted a Mitigated Negative Declaration (2017 MND, SCH Number 2017061030) for the High Desert Water Bank Project (Project). Based on the 2021 Project Design, the Agency is required to reassess potential impacts and determine if the Project revisions require an Amendment or an Addendum to the 2017 MND.

3.2.1 Initial Study/MND Amendment

CEQA Guidelines Section 15162 states that when a negative declaration has been adopted for a project, no subsequent negative declaration shall be prepared for that project unless the lead agency determines, on the basis of substantial evidence in the light of the whole record, one or more of the following:

> *(1) Substantial changes are proposed in the project which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;*
>
> *(2) Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or Negative Declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or*
>
> *(3) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the Negative Declaration was adopted, shows any of the following:*
>
> > *(A) The project will have one or more significant effects not discussed in the previous EIR or negative declaration;*

(B) Significant effects previously examined will be substantially more severe than shown in the previous EIR;

(C) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or

(D) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

The guidelines further state that if changes to a project or its circumstances occur or new information becomes available after adoption of a negative declaration, the lead agency shall prepare a subsequent negative declaration if required under subdivision (a). Otherwise the lead agency shall determine whether to prepare a subsequent negative declaration, an addendum, or no further documentation.

3.2.2 Initial Study/MND Addendum

CEQA Guidelines Section 15164 sets out the conditions in which an adopted MND can be revised or amended:

(a) The lead agency or a responsible agency shall prepare an addendum to a previously certified EIR if some changes or additions are necessary but none of the conditions described in Section 15162 calling for preparation of a subsequent EIR have occurred.

(b) An addendum to an adopted negative declaration may be prepared if only minor technical changes or additions are necessary or none of the conditions described in Section 15162 calling for the preparation of a subsequent EIR or negative declaration have occurred.

(c) An addendum need not be circulated for public review but can be included in or attached to the final EIR or adopted negative declaration.

(d) The decision-making body shall consider the addendum with the final EIR or adopted negative declaration prior to making a decision on the project.

(e) A brief explanation of the decision not to prepare a subsequent EIR pursuant to Section 15162 should be included in an addendum to an EIR, the lead agency's required findings on the project, or elsewhere in the record. The explanation must be supported by substantial evidence.

3.3 INITIAL STUDY CHECKLIST

The 2017 CEQA Guidelines were used to analyze the 2017 Original Project Design, and an MND was adopted (2017 MND). Since that time, the California Natural Resources Agency (the "Natural Resources Agency") amended the CEQA Guidelines effective in 2018 and 2019.

The amendments addressed legislative changes to the California Environmental Quality Act (CEQA), clarified certain portions of the existing CEQA Guidelines, and updated the CEQA Guidelines to be consistent with recent court decisions.

The following changes to the 2019 CEQA Guidelines include:

- Added sections: 15064.3 (transportation) and 15234 (remand procedures).

- Amended sections: 15004, 15051, 15061, 15062, 15063, 15064, 15064.4, 15064.7, 15072, 15075, 15082, 15086, 15087, 15088, 15094, 15107, 15124, 15125, 15126.2, 15126.4, 15152, 15155, 15168, 15182, 15222, 15269, 15301, 15357, 15370, and Appendix G, Appendix M and Appendix N.

As a result of the revised Guidelines, the CEQA Checklist, located in Appendix G of the Guidelines and used to analyze Project impacts, was revised. Many checklist sections underwent minor modifications and clarifications to incorporate the revised CEQA statute revisions. However, two new checklist sections were added – "Energy" and "Wildfire" – in 2019.

Another legislative change that occurred was with respect to Traffic/Transportation. Section 15064.3 of the CEQA Guidelines was added to switch from Level of Service (LOS) to Vehicle Miles Traveled (VMT) as metric for transportation impact analysis. Los Angeles County's July 2020 Traffic Impact Study Guidelines, identify that the VMT analysis should be consistent with the CEQA Guidelines in that the VMT analysis applies only to "development projects."

The CEQA Guidelines have been amended since 2019, with the current version being the 2021 Guidelines, but there have been no substantive revisions that impact a project analysis.

Pursuant to Public Resources Code Section 21166, and CEQA Guidelines Sections 15162 and 15164, subd. (a), the attached Initial Study Checklist has been prepared to evaluate the 2021 Revised Project Design. The attached Initial Study Checklist uses the standard environmental checklist categories provided in Appendix G of the CEQA Guidelines, but provides response columns for evaluation consistent with the considerations listed under CEQA Guidelines Section 15162, subd. (a).

3.4 MITIGATION MONITORING AND REPORTING PROGRAM

The 2017 MND included a Mitigation Monitoring and Reporting Program (MMRP) that identified mitigation measures, timing and compliance requirements that would reduce impacts to less than significant. The MMRP adopted is included in Appendix A. The Mitigation Measures are summarized in Table 3.4-1.

The attached Initial Study also evaluated the existing mitigation measures to determine if the 2021 Revised Project Design would require clarification of, or additional, mitigation measures as identified in the 2017 MND.

Table 3.4-1: Mitigation Measure Summary

Topic Area	MM Number	Summary Description
General	Pre Construction Training	Determine the need for a pre-construction training program
Ag Resources	AG-1	Prime Farmland Avoidance.
Air Resources	AQ-1	Minimization Measure for NOx Related Emissions
Biological Resources	BIO-1	Burrowing Owls (Pre-Construction Surveys)
Biological Resources	BIO-2	Desert Kit Fox and American Badger (Pre-Construction Surveys)
Biological Resources	BIO-3	Nesting Birds (Pre-Construction Surveys)
Biological Resources	BIO-4	Animal Movement and Entrapment (Trenches)
Biological Resources	BIO-5	Animal Movement and Entrapment (Pipes)
Biological Resources	BIO-6	Erosion and Sediment Control
Biological Resources	BIO-7	Special-Status Plants
Biological Resources	BIO-8	Swainson's Hawk (focused surveys prior to recharge basin construction)
Biological Resources	BIO-9	Tri-colored Blackbirds (focused surveys prior to recharge basin construction)
Biological Resources	BIO-10	Jurisdictional Drainages and Wetlands and Permitting (prior to recharge basin construction)
Biological Resources	BIO-11	Habitat Mitigation (prepare Habitat Mitigation Management Program)
Biological Resources	BIO-12	General (construction crew training, site and staging guidelines)
Cultural Resources	CR-1	Cultural Resources Monitoring (develop a Cultural Resources Monitoring and Mitigation Plan prior to start of ground disturbance)
Cultural Resources	CR-2	Regulation Compliance (accidental discovery of human remains)
Geology and Soils	GEO-1	Stormwater Pollution Prevention Plan (SWPPP)
Geology and Soils	GEO-2	Seismic Design
Geology and Soils	GEO-3	Pipeline Shut Off Valves
Geology and Soils	GEO-4	Groundwater Monitoring Plan
Hazards and Haz Materials	HAZ-1	Spill Prevention Plan
Hazards and Haz Materials	HAZ-2	Bird Strike Hazard Notification
Hazards and Haz Materials	HAZ-3	Bird Strike Hazard Minimization Measures
Hazards and Haz Materials	HAZ-4	Mosquito Borne Disease Minimization Measures
Hydrology and Water Quality	HWQ-1	Drainage Design (Construct recharge areas so that they will not divert sheet flooding and other runoff away from the recharge areas)
Hydrology and Water Quality	HWQ-2	Stormwater Pollution Prevention Plan (SWPPP)
Hydrology and Water Quality	HWQ-3	Spill Prevention Plan
Hydrology and Water Quality	HWQ-4	Protection of Off Site Wells
Hydrology and Water Quality	HWQ-5	Management of Herbicides and Pesticides

Topic Area	MM Number	Summary Description
Noise	NOISE-1	Construction Noise Monitoring and Minimization Measures (near and along 280th Street West)
Noise	NOISE-2	Operation Noise Minimization Measures (near and along 280th Street West)
Tribal Cultural Resources	TCR-1	Inadvertent Finds
Utilities	UTIL-1	Electrical Service Upgrade Minimization Measures (expansion of grid for Project)

3.5 ENVIRONMENTAL ANALYSIS CONCLUSION

The IS/MND for the 2017 Original Project Design was prepared utilizing the 2017 CEQA Appendix G Checklist.

This Addendum will assess the 2021 Revised Project Design using the 2021 CEQA Guidelines for criteria. Additionally, assessments for the new CEQA Checklist sections for Energy and Wildfire are added for completeness.

The following Environmental Subject Areas require no further analysis and are not addressed in this Addendum because: 1) there were either no or non-substantive revisions to the Guidelines in these sections; 2) the nature of the evaluation criteria applies broadly to the Project area which has not changed irrespective of the changes to the Project design; and 3) the 2017 MND identified either no impact or less than significant impact and no mitigation measures in the subject areas:

I. Aesthetics

XI. Land Use and Planning

XII. Mineral Resources

XIV. Population and Housing

XV. Public Services

XVI. Recreation

This Addendum, checklist, and attached documents constitute substantial evidence supporting the conclusion that preparation of a supplemental or subsequent EIR or ND is not required because none of the conditions described in CEQA Guidelines Section 15162 (Subsequent EIRs and Negative Declarations) calling for the preparation of supplemental or subsequent environmental review have occurred and provides the required documentation under CEQA Guidelines Section 15164.

3.6 DETERMINATION

There are no substantial changes proposed by the 2021 Revised Project Design or in the circumstances in which the 2021 Revised Project Design will be undertaken that require major revisions of the 2017 MND. The proposed 2021 Revised Project Design does not require preparation of a new subsequent or supplemental EIR, ND, or MND, due to either the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects. As illustrated herein, the proposed 2021 Revised Project Design is consistent with the previous 2017 MND and would involve only minor changes; therefore, an Addendum is appropriate CEQA compliance for the proposed project.

3.7 FINDING

Based on an examination of the analysis, findings, and conclusions of the 2017 MND, the potential impacts of the proposed 2021 Revised Project Design remains within the impacts previously analyzed and disclosed in the 2017 MND and none of the conditions in CEQA Guidelines Section 15162 exist (CEQA Guidelines § 15164). Therefore, an addendum to the 2017 MND is the appropriate environmental document for the 2021 Revised Project Design and no further analysis is required under CEQA before undertaking the proposed project.

Signature	Date
Name	Title

4 ENVIRONMENTAL ANALYSIS

The purpose of the checklist is to evaluate the categories in terms of any changed condition (e.g., changed circumstances, project changes, or new information of substantial importance) that may result in a changed environmental result (e.g., a new significant impact or substantial increase in the severity of a previously identified significant effect) (CEQA Guidelines § 15162).

The questions posed in the checklist come from Appendix G of the CEQA Guidelines and the 2017 MND. A "no" answer does not necessarily mean that there are no potential impacts relative to the environmental category, but that there is no change in the condition or status of the impact since it was analyzed and addressed with mitigation measures in the 2017 MND.

EXPLANATION OF CHECKLIST EVALUATION CATEGORIES

Environmental Subject Area

The checklist utilized is from Appendix G of the 2021 CEQA Guidelines. As discussed, most of the evaluation criteria only underwent minor changes, clarifications, or were moved to various other sections, and two criteria sections – Energy and Wildfire - have been added. For this analysis, revisions to the evaluation criteria between the 2017 MND evaluation and the 2021 Guidelines will be noted in underlined type (<u>underlined</u>) for added text and strikeout text (~~strikeout~~) for deleted text in the criteria in this section.

Conclusion in 2017 MND and Related Documents

This column identifies the conclusion of the 2017 MND relative to the Environmental Subject Area listed under each topic as identified in the 2017 MND.

Do the Proposed Changes Involve New Impacts?

Pursuant to CEQA Guidelines Section 15162, subd. (a)(1), this column indicates whether the 2021 Revised Project Design will result in new significant environmental impacts not previously identified or mitigated by the 2017 MND or whether the 2021 Revised Project Design will result in a substantial increase in the severity of a previously identified significant impact.

New Circumstances Involving New Impacts?

Pursuant to CEQA Guidelines Section 15162, subd. (a)(2), this column indicates whether the 2021 Revised Project Design results in substantial changes with respect to the circumstances under which the project is undertaken that will require major revisions to the 2017 MND due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.

New Information Requiring New Analysis or Verification?

Pursuant to CEQA Guidelines Section 15162, subd. (a)(3)(A-D), this column indicates whether new information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the 2017 MND was adopted, shows any of the following:

(A) The project will have one or more significant effects not discussed in the previous EIR or negative declaration;

(B) Significant effects previously examined will be substantially more severe than shown in the previous EIR;

(C) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or

(D) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

If the additional analysis completed as part of this environmental review were to find that the conclusions of the 2017 MND remain the same and no new significant impacts are identified, or identified impacts are not found to be substantially more severe, or additional mitigation is not necessary, then the question would be answered "no" and no additional environmental document would be required.

Mitigation Measures Implemented or Address Impacts

Pursuant to CEQA Guidelines Section 15162, subd. (a)(3), this column indicates whether the 2017 MND provides mitigation measures to address effects in the related impact category. Any previously adopted mitigation measures will be identified. The response will also address proposed revisions to previously adopted mitigation measures. These mitigation measures will be implemented with the construction of the project, as applicable. If "NA" is indicated, the 2017 MND has concluded that the impact either does not occur with this project or is not significant, and therefore no additional mitigation measures are needed.

Discussion

The Discussion section provides a narrative of the assumptions and conclusions identified for the 2018 Original Project Design in the 2017 MND, and analyzes how those conclusions compare to the 2021 Revised Project Design.

Mitigation Measures

Applicable mitigation measures from the 2017 MND identified in each environmental category where the 2017 MND identified mitigation. Any revisions or new measures are also identified in this section.

Conclusions

A discussion of the conclusion relating to the analysis is contained in each section.

4.1 AGRICULTURE & FORESTRY RESOURCES

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
II. AGRICULTURE AND FORESTRY RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. 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?	Less Than Significant With Mitigation Incorporated	No	No	No	AG-1
b) Conflict with existing zoning for agricultural use or a Williamson Act contract?	Less Than Significant	No	No	No	None
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	Less Than Significant	No	No	No	None
d) Result in the loss of forest land or conversion of forest land to non-forest use?	Less Than Significant	No	No	No	None
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?	Less Than Significant	No	No	No	None

4.1.1 Discussion

Summary of 2017 MND

Based on the analysis of the potential effects of the proposed Project, the Initial Study concluded that with Mitigation Measure AG-1 the impact to agriculture and forest resources will be less than significant. An area of semi-active farmed Prime Farmland occurs within the northwestern portion of the site (Figure 4, 2017 MND), and is not identified for use as recharge or for other facilities. Fallowed Prime Farmland will remain fallowed with the option to use for recharge operations.

The Project will not involve any land use zoning or designation changes and there is no Williamson Act farmland within the Project site. Additionally, there are no forest or timber lands within the Project site.

2021 Revised Project Analysis

The 2021 Revised Project will occur within the same location as previously analyzed. The recharge basins will occur within the same areas as previously assessed, and the Prime Farmland identified in the 2017 MND will remain as farmland.

4.1.2 Mitigation Measures

The 2017 MND identified the following mitigation measure to reduce impacts to less than significant.

AG-1: **Prime Farmland Avoidance** – The Agency will not perform recharge operations on the 60 acres of semi active farmed Prime Farmland on the northwest corner of the property.

Revisions to Mitigation Measures:

The 2021 Revised Project Design does not require a modification of the existing measure or the addition of any new measures to reduce impacts to less than significant.

4.1.3 Conclusion

The 2021 Revised Project Design does not change the type or extent of development analyzed in the 2017 MND. Development of the 2021 Revised Project Design does not propose substantial agricultural and forest resources changes beyond those analyzed in the 2017 MND or require major revisions to the 2017 MND. Therefore, the 2021 Revised Project Design would not involve new significant agricultural and forest resources impacts or more severe agricultural and forest resource impacts than those previously identified and analyzed in the 2017 MND. No additional analysis or mitigation measures are required.

4.2 AIR QUALITY

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
III. AIR QUALITY: Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:					
a) Conflict with or obstruct implementation of the applicable air quality plan?	Less Than Significant	No	No	No	None
~~b) Would not violate any air quality standard or contribute substantially to an existing or projected air quality violation~~	Less Than Significant	NA – Removed from Guidelines	NA – Removed from Guidelines	NA – Removed from Guidelines	NA – Removed from Guidelines
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?	Less Than Significant With Mitigation Incorporated	No	No	No	AQ-1
c) Expose sensitive receptors to substantial pollutant concentrations?	Less Than Significant	No	No	No	None
d) ~~Create objectionable~~ Result in other emissions (such as those leading to odors adversely affecting a substantial number of people?	Less Than Significant	No	No	No	None

4.2.1 Discussion

Summary of 2017 MND

Project impacts were determined to be less than significant, except for potentially NOx emissions during construction of overlapping activities.

The 2017 MND identified that the Project's construction emissions are short term or temporary but have the potential to result in a significant impact on air quality. Construction activities for the project would generate temporary emissions of volatile organic compounds (VOC) and NOX, CO, PM10, and PM2.5. VOC, NOX, and CO emissions are associated primarily with mobile equipment exhaust, including off road construction equipment and on road motor vehicles. Fugitive particulate matter dust emissions are associated primarily with site preparation and travel on unpaved roads and vary as a function of parameters such as soil silt content, soil moisture, wind speed, acreage of disturbance area, and miles traveled by construction vehicles. Emissions would vary from day to day, depending on the level of

activity, the specific type of construction activity occurring, and, for fugitive dust, prevailing weather conditions.

The Project is located in the Antelope Valley Air Quality Management District (AVAQMD), which has established recommended annual and daily thresholds of significance for criteria pollutant emissions as shown in 2017 MND Tables 2.4-1 and 2.4-2, respectively. A project with emission rates below these thresholds is considered to have a less than significant effect on regional and local air quality throughout the AVAQMD.

The 2017 MND modeled potential construction emissions, based on the scope of work and construction duration. Construction was assumed to involve demolition of several structures, including one small residence; the amount of demolition was deemed negligible due to the overall project size. The remainder of the project consists primarily of drilling, earthmoving, and small construction projects (e.g. turnout installation [to withdraw water from the California Aqueduct], underground pipeline placement; pump metering/booster station and storage tank construction). Fugitive dust generation was estimated for drilling and grading, spreading and stockpiling of spoils, and above ground pipeline installation. Paved and unpaved road dust would occur from worker vehicle trips and haul truck trips on highways, local roads, and access roads. Particulate emissions associated with vehicle travel over unpaved roads were conservatively estimated assuming a one way distance of 3 miles per trip, the anticipated maximum distance traveled over unpaved roads for both worker and delivery vehicles. The project would implement applicable AVAQMD rules and regulations such as: Rule 1140 (Abrasive Blasting), Rule 1113 (Architectural Coatings), Rule 1110.2 (Emissions from Stationary, Non-road & Portable Internal Combustion Engines), as well as appropriate dust-abatement measures to comply with regulations Rule 401 (Visible Emissions), Rule 403 (Fugitive Dust), and Rule 404 (Particulate Matter Concentration).

Construction of the project was expected to last approximately 24 months. The construction emissions analysis relied on a project specific construction schedule and inventory of construction equipment estimates. The estimated construction workforce is a maximum of thirty workers per day. Project construction was conservatively analyzed using multiple overlapping activity scenarios to obtain the worst case daily emissions.

As shown in Table 2.4-1 of the 2017 MND, the annual construction emissions associated with the Project are below the AVAQMD annual thresholds. However, when modeled for overlapping activities, (refer to 2017 MND Table 2.4-2), daily emissions associated with the worst case overlapping construction activity scenario were only exceeded for NOx by approximately 30 pounds per day. Modeling assumptions and details are provided in the Air Quality Analysis Technical Report located in Appendix C of the 2017 MND.

As such, a mitigation measure was developed to reduce impacts to less than significant.

2021 Revised Project Analysis

An Air Quality Analysis (Appendix B) was conducted based on the 2021 Revised Project Design, using the assumptions presented in the tables in Section 2.4 of this Initial Study Addendum. The latest version of CalEEMod (2020.4.0) was utilized to analyze the 2021 Revised Project emissions on only activities that were significantly updated, which are as follows: Activity 3: Transmission Facility / Underground Pipeline; Activity 4: Recharge Facility / Recharge Basin, Grading, Above-ground Pipeline Install; and Activity 5:

Recovery Facilities / Extraction Wells / Recovery (Activity numbers were assigned to facilitate the air quality analysis).

Construction of the project is expected to last approximately 21 months. The construction emissions analysis relied on a project specific construction schedule and inventory of construction equipment estimates identified in Section 2.4 of this Addendum. The estimated construction workforce is a maximum of 30 workers per day. Project construction was conservatively analyzed using multiple overlapping activity scenarios to obtain the worst case daily emissions.

The results of the Air Quality analysis conducted for the 2021 Revised Project concluded that construction emissions for the project would not exceed the AVAQMD's daily emission thresholds at the regional level as indicated in Table 4.2-1, and therefore the impact would not be considered significant. The emissions were calculated using the 2017 MND Mitigation Measure AQ-1, which requires the use of off-road construction diesel engines that meet Tier 4 interim California Emission Standards. Unmitigated emissions would exceed the AVAQMD NOx threshold of 137 pounds per day by approximately 50 pounds per day, while mitigated emissions would be below the same threshold by approximately 0.85 pounds per day.

AECOM had previously performed an air quality analyses for this project for the 2017 MND. Table 4.2-1 identifies the 2017 MND thresholds, as well as the 2021 Revised Project design emissions, both without the 2017 MND mitigation measure in place (unmitigated) and with 2017 MND mitigation measure in place (mitigated) as a comparison of Project emissions.

As such, the mitigation measure developed for the 2017 MND was determined to reduce impacts to less than significant. No further mitigation is necessary to reduce impacts to less than significant under the 2021 Revised Project.

Table 4.2-1: Air Quality Emissions Project Comparison

Activity	Pollutant Emissions (lbs/day)				
	VOC	NOx	CO	PM10	PM2.5
Activity 3: Transmission Facility / Underground Pipeline					
2017 Original Project Design[2]	1.36	21.76	39.21	10.05	2.98
2021 Revised Project Design - Unmitigated	4.47	38.71	44.65	4.19	2.21
2021 Revised Project Design - Mitigated	1.84	26.26	56.09	2.65	0.08
Mitigated Emission Change	0.48	4.50	16.88	-7.40	-2.90
Activity 4: Recharge Facility / Recharge Basin, Grading, Above-ground Pipeline Install					
2017 Original Project Design[2]	0.61	4.43	12.02	3.01	1.73
2021 Revised Project Design - Unmitigated	6.89	66.94	59.23	6.38	3.31
2021 Revised Project Design - Mitigated	2.29	32.24	70.63	3.73	0.89
Mitigated Emission Change	1.68	27.81	58.61	0.72	-0.84
Activity 5: Recovery Facilities / Extraction Wells / Recovery					
2017 Original Project Design[2]	2.79	45.12	77.05	38.47	5.67
2021 Revised Project Design - Unmitigated	9.71	88.81	74.32	6.45	3.78
2021 Revised Project Design - Mitigated	5.10	73.69	150.70	3.92	1.42
Mitigated Emission Change	2.31	28.57	73.65	-34.55	-4.25
Subtotal of Activities 1,2,5 (overlap Year 1, months 1-3)					
2017 Original Project Design[2]	5.79	88.06	146.07	57.3	10.56
2021 Revised Project Design - Unmitigated	12.71	131.75	143.34	25.28	8.67
2021 Revised Project Design - Mitigated	8.10	116.63	219.72	22.75	6.31
Subtotal of Activities 3,5 (overlap Year 1, months 11,12)					
2017 Original Project Design[2]	4.15	66.88	116.26	48.52	8.65
2021 Revised Project Design - Unmitigated	14.18	127.52	118.97	10.64	5.99
2021 Revised Project Design - Mitigated	6.94	99.95	206.79	6.58	1.50
Subtotal of Activities 3,5,6 (overlap Year 2, months 1-5)					
2017 Original Project Design[2]	30.99	97.09	153.59	70.08	13.11
2021 Revised Project Design - Unmitigated	41.02	157.73	156.30	32.20	10.45
2021 Revised Project Design - Mitigated	33.78	130.16	244.12	28.14	5.96
Subtotal of Activities 4.5,6 (overlap Year 2, month 6)					
2017 Original Project Design[2]	30.24	79.76	126.4	63.05	11.86
2021 Revised Project Design - Unmitigated	43.44	185.96	170.89	34.39	11.54
2021 Revised Project Design - Mitigated	34.23	136.14	258.65	29.23	6.77
2017 Maximum Daily Construction Emissions[2]	30.99	97.09	153.59	70.08	13.11
2021 Unmitigated Maximum Daily Construction Emissions	43.44	185.96	170.89	34.39	11.54
2021 Mitigated Maximum Daily Construction Emissions	**34.23**	**136.14**	**258.65**	**29.23**	**6.77**
Change in Maximum Daily Construction Emissions - Unmitigated	12.45	88.87	17.30	-35.69	-1.57
Change in Maximum Daily Construction Emissions - Mitigated	3.24	39.05	105.06	-40.85	-6.34
AVAQMD Thresholds	**137**	**137**	**548**	**82**	**65**
Exceeds Thresholds	No	**No**	No	No	No

Notes:
[1] Source: CalEEMod Version 2020.4.0
[2] Source: 2017 AECOM – Air Quality Technical Memorandum

4.2.2 Mitigation Measures

The 2017 MND identified the following mitigation measure to reduce impacts to less than significant:

AQ-1 **Minimization Measure for NOx Related Emissions -** Construction contractor shall use off road construction diesel engines that meet, at a minimum, the Tier 4 interim California Emissions Standards, unless such an engine is not available for a particular item of equipment. Tier 3 engines will be allowed on a case-by-case basis when the contractor has documented that no Tier 4 interim equipment, or emissions equivalent retrofit equipment is available for a particular equipment type that must be used to complete construction. Documentation shall consist of signed written statements from at least two construction equipment rental firms.

Revisions to Mitigation Measures:

The 2021 Revised Project Design does not require a modification of the existing measure or any new measures to reduce impacts to less than significant.

4.2.3 Conclusion

The 2021 Revised Project Design does not change the type or extent of development analyzed in the 2017 MND. Applicable mitigation measures previously identified in the 2017 MND will be required as set forth in the MMRP, and no considerably different mitigation measures that may substantially reduce impacts have been identified or rejected. The 2021 Revised Project Design does not propose substantial air quality changes beyond those analyzed in the 2017 MND or require major revisions to the 2017 MND. Therefore, the 2021 Revised Project Design would not involve new significant or more severe air quality impacts than those previously identified and analyzed in the 2017 MND. No additional analysis or mitigation measures are required.

4.3 BIOLOGICAL RESOURCES

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
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 Service?	Less Than Significant With Mitigation Incorporated				BIO-1, through BIO-5, BIO-7 through BIO-9 BIO-11 BIO-12
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?	Less Than Significant				None
c) Have a substantial adverse effect on <u>state or</u> federally protected wetlands ~~as defined by Section 404 of the Clean Water Act~~ (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means	Less Than Significant With Mitigation Incorporated				BIO-6, BIO-7 BIO-10, BIO-12
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?	Less Than Significant				None
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	Less Than Significant				None

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	Less Than Significant	No	No	No	None

4.3.1 Discussion

Summary of 2017 MND

No impacts or less than significant impacts were determined to be applicable to following the criteria, and no further discussion is warranted:

b) Riparian habitat or sensitive habitat identified in Federal, State and/or local plans – none was found within the Project site.

d) Wildlife corridors and/or nursery sites – none exist within the Project site.

e) Local biological protection ordinances – no ordinances are applicable to the Project site.

f) Conflict with adopted Federal, State and/or local plans – there are no plans applicable to the Project site.

Criteria IV(a): State and Federal sensitive species and habitat modification

Based on the results of the CNDDB search and the field surveys, the Project site is known to or expected to support sensitive biological resources and native habitats which will be disrupted or removed by the proposed Project. Potential impacts include destruction of nests and disruption of natural nesting behaviors in nesting birds, including raptors, and removal of potentially suitable habitats for sensitive and special-status wildlife species, including American badger, desert kit fox, burrowing owls, and others.

The Project would impact approximately 1,200 acres of potentially suitable foraging and sheltering habitats utilized by native wildlife species. Permanent impacts include those areas which would be developed to support groundwater recovery and monitoring wells, aboveground pipelines, and related infrastructure, and total approximately 12 acres. Temporary impacts include vegetation clearing, earthen berm construction, and regular, rotating inundation of the recharge basins, and would affect approximately 1,200 acres of the site. Rotating inundation would temporarily remove an average of up to 400 acres of the recharge basins from use as habitat at any one time. Other temporary impacts include excavations and work areas associated with installation of the buried pipelines, and will affect approximately 70 acres of the site; these areas are expected to occur mostly within the recharge basin footprint.

The 2017 MND identifies the general location of the flood recharge areas in *Figure 2 Schematic Flood Recharge Operations,* and in Figure 2.4-7 of this Addendum. However, the 2017 MND did not identify the locations or how the 400 acres would be rotated, other than the basins would be rotated in various areas of the 1,200 acre Project site.

No federally- or State-listed species were observed within the Project site. Although one State candidate, tricolor blackbird, was observed on an adjacent property, the Project site does not support suitable nesting habitat for this species, and foraging habitats are common in the vicinity. Implementation of appropriate mitigation measures including pre-construction survey for nesting birds, active burrowing owl burrows, and active desert kit fox and American badger dens, will avoid direct adverse impacts to special-status species, should they occur within the Project Area.

Impacts to suitable habitats for native common and special-status plant and wildlife species as a result of construction of the proposed Project include the permanent removal of approximately 12 acres and temporary impacts to approximately 70 acres of suitable habitat, as well as construction of approximately 1,200 acres of recharge basins. Operations associated with inundation of the basins will periodically, temporarily remove an average of up to 400 acres of habitat at any one time. These impacts are rotational, irregular in timing, and are not expected to be continual; the majority of the basins will remain available for use as foraging and transitory habitat by native wildlife.

Because special-status plant species are not expected to occur, impacts to special-status plant species habitats are not expected to be significant.

Nonetheless, habitat management lands will provide approximately 322 acres of undisturbed native and naturalized vegetation communities that will provide habitat for both common and special-status plant and wildlife species within the Project site. Similar habitats also are common within the Project vicinity. Thus, loss of habitat due to permanent impacts associated with the Project and temporary loss due to inundation of the recharge basins does not represent a substantial impact to any species.

Wildlife species may use the open spaces within the Project site for dispersal and transitory movement, and may be subject to potential injury or entrapment in open trenches and open-ended pipes. To prevent entrapment, injury, and mortality, mitigation measures are required to reduce impacts to less than significant.

Additional mitigation measures to protect habitat and species included general crew training, staging guidelines and preparation of a Habitat Mitigation Management Program (HMMP).

Criteria IV(c): State and Federal wetlands

The 2017 MND identified that there were no federally protected waters occur within the Project site. None of the potential wetland and waters features exhibit hydrologic connection to any Traditional Navigable Waters (TNWs). Thus, there will be no impacts to federally protected wetlands.

It should be noted that the CEQA Guidelines in place at the time of the 2017 MND only required an assessment of potential impacts to federal waters.

However, based on comments from the California Department of Fish and Wildlife (CDFW) during the pubic comment period, Mitigation Measure BIO-10 was added to require a formal jurisdictional delineation for both State and Federal waters. Prior to the 2017 MND adoption, the Agency fulfilled the requirements of BIO-10 and conducted the jurisdictional waters assessment. The results of that assessment were also included in the final 2017 MND that was adopted.

The 2017 Jurisdictional Delineation identified that the Project site supported two intermittent streams and two potential wetland features and the features are potential CDFW-jurisdictional streambeds, subject to CDFW regulatory authority under section 1600 *et seq.* of the California Fish and Game Code. Refer to Figure 4.3 1 for the location of the drainages from the 2017 Biological Resources Report that supported the 2017 MND.

The 2017 MND identified that the Project would not remove or alter these features; recharge basins and associated infrastructure will be constructed outside the historic drainages to preserve natural migratory movement of the streams and to prevent the constraint of flows where previously they dispersed over wide, flat plains, therefore, the disruption of or impacts to drainages and potential wetlands are avoided. Constraint of flows within the drainages, particularly where they cross open, relatively flat grasslands, could cause increased erosion and channelization of the features in these areas, as well as sedimentation of downstream waters. In order to avoid this potential impact, drainages will be protected within on-site habitat management lands that will be preserved and managed by the Agency.

The 2017 MND also identified that a variable 50- to 100-foot buffer will be established along both sides of the drainages, and around the seasonal wetland feature. The buffer will be wider along portions of the drainage course where historic aerials show wider extents of inundation, and narrower where flows are naturally more restricted to the defined channel. Avoidance of construction within the channel and floodplain, and implementation of suitable buffers, will avoid impacts to waters and wetlands. Thus, no impacts to waters of the State are anticipated.

However, should the Project implementation require impacts to waters of the State, the Project will obtain all applicable regulatory permits prior to any fill or alteration of waters features, including submission of a Notification of Lake or Streambed Alteration application, in order to support the CDFW in determining the need for a Lake and Streambed Alteration Agreement (LSA). Issuance of an LSA for the Project will require the CDFW, as a Responsible Agency, to ensure CEQA compliance, including employment of adequate avoidance, mitigation, monitoring, and reporting commitments associated with the LSA.

2021 Revised Project Analysis

A Biological Resources Analysis of the 2021 Revised Project Design was prepared by ELMT Consulting in September 2021 (Appendix C).

The 2021 Biological Resources Analysis did not discover any major changes in site conditions since the 2017 assessment, except for a small thicket of sandbar willow found only within and near a pump discharge basin near the middle of the southern boundary of the project site. This plant community was not documented in the plant community section of the 2017 biological report, but it was mentioned in the water features section of the 2017 biological report. This area is fed constantly by water from the

adjacent pump station and also supports a small pond feature as a result of overflow within the pump station. Figure 4.3 1 identifies the drainages from the 2017 Biological Resources Report that supported the 2017 MND, and those features were confirmed in the 2021 Biological Resources Analysis. No additional drainages were discovered in the 2021 Biological Resources Analysis.

The 2021 Biological Resources Analysis analyzed how the design changes would or would not impact the site habitat and wildlife and also assessed the change in the location of the habitat management lands.

The 2021 Biological Resources Analysis (Appendix C) determined that while the original design would only utilize 400 acres annually for recharge, the design including rotating the 400 acre recharge area throughout the approximately 1,200 acre site, similar to agricultural farming thus disturbing all of the 1,200 acres over time. With the revised design being fixed basins of approximately 890 acres, and recharge occurring over a shorter time frame, wildlife will have a fixed, consistent landscape in which to forage and nest as well as fixed areas for water sources. Overall, this would provide a benefit of stability to the on-site wildlife.

Further, the 2021 Biological Resources Analysis also evaluated the re-location of the 322 acres designated for habitat management in the 2017 MND. The 2017 design location provided larger blocks of habitat in the northern and southern portions of the property with narrow pathways of refuge and movement in two drainages. The 2021 Revised Project design essentially eliminates the southern block and reduces the northern block but provides a wider corridor of preservation in the drainage located in the middle of the site, as well as a wider strip along the aqueduct to facilitate wildlife movement between the northern and southern portions of the site, as well as good habitat in the central drainage area. The larger blocks of habitat, along with the constructed basins, provide higher quality local wildlife movement opportunities across the site, while providing potential watering holes.

Based on the result of the 2021 updated literature review and field investigation, and revised project design, the overall conclusions and mitigation measures contained in the 2017 MND remain valid. Impacts to special-status plant and wildlife species will be less than significant with incorporation of the mitigation measures (BIO-1 thru 12) detailed in the 2017 MND.

4.3.2 Mitigation Measures

The 2017 MND identified the following mitigation measure to reduce impacts to less than significant:

For brevity, these measures are summarized below, and the full text is included in Appendix A.

- BIO-1 Burrowing Owls (Pre-Construction Surveys)
- BIO-2 Desert Kit Fox and American Badger (Pre-Construction Surveys)
- BIO-3 Nesting Birds (Pre-Construction Surveys)
- BIO-4 Animal Movement and Entrapment (Trenches)
- BIO-5 Animal Movement and Entrapment (Pipes)
- BIO-6 Erosion and Sediment Control
- BIO-7 Special-Status Plant surveys
- BIO-8 Swainson’s Hawk (focused surveys prior to recharge basin construction)
- BIO-9 Tri-colored Blackbirds (focused surveys prior to recharge basin construction)

BIO-10 Jurisdictional Drainages and Wetlands and Permitting (prior to recharge basin construction)
BIO-11 Habitat Mitigation (prepare Habitat Mitigation Management Program)
BIO-12 General (construction crew training, site and staging guidelines)

Revisions to Mitigation Measures:

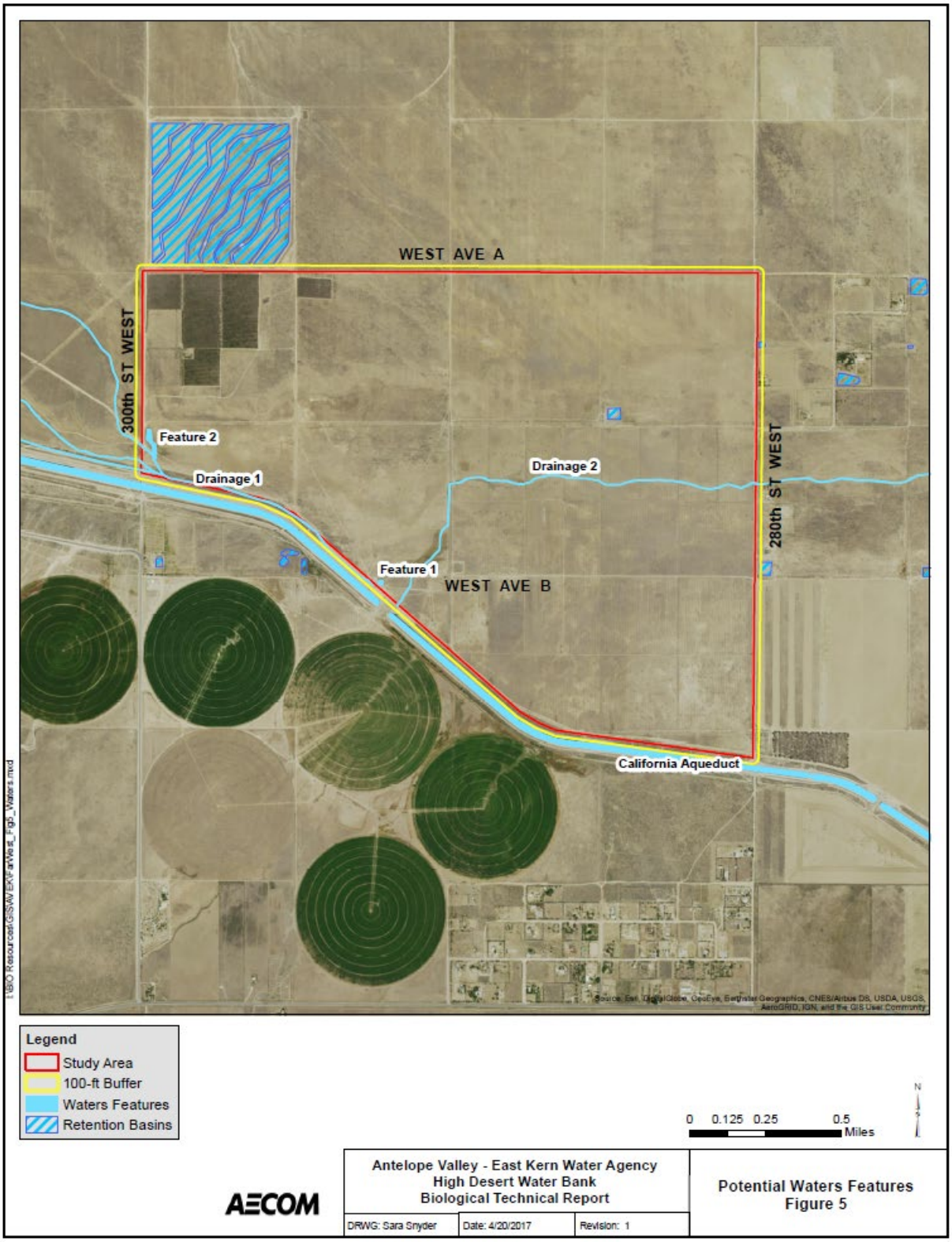
The 2021 Revised Project Design does not require a modification of any existing measure or the addition of any new measures to reduce impacts to less than significant.

Because the design has changed, the Jurisdictional Delineation completed under BIO-10 is required to be revised to ensure that the Project will not impact jurisdictional drainages. However, the 2021 Revised Project Design also includes buffer areas around the drainage areas, to reduce impacts.

4.3.3 Conclusion

The 2021 Revised Project Design does not change the type or extent of development analyzed in the 2017 MND. Applicable mitigation measures previously identified in the 2017 MND will be required as set forth in the MMRP, and no considerably different mitigation measures that may substantially reduce impacts have been identified or rejected. Development of the 2021 Revised Project Design does not propose substantial changes in biological resources beyond those analyzed in the 2017 MND or require major revisions to the 2017 MND. Therefore, the 2021 Revised Project Design would not involve new significant biological resource changes or more severe biological resource impacts than those previously identified and analyzed in the 2017 MND. No additional analysis or mitigation measures are required.

Figure 4.3-1: Potential Water Features Identified in Biological Studies



4.4 CULTURAL RESOURCES

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
V. CULTURAL RESOURCES: Would the project:					
a) Cause a substantial adverse change in the significance of a historical resource ~~as defined in~~ pursuant to 15064.5?	Less Than Significant	No	No	No	None
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to 15064.5?	Less Than Significant With Mitigation Incorporated	No	No	No	CUL-1
~~c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?~~	Refer to Section 4.7, Criterion VII(f)	(NA - Moved to Geological Resources in Guidelines)	(NA - Moved to Geological Resources in Guidelines)	(NA - Moved to Geological Resources in Guidelines)	Refer to Section 4.7, Criterion VII(f)
c) Disturb any human remains, including those interred outside of formal cemeteries?	Less Than Significant With Mitigation Incorporated	No	No	No	CUL-2

4.4.1 Discussion

Summary of 2017 MND

A Cultural Resources Assessment was included in the analysis provided in the 2017 MND. As part of the assessment, A Phase I cultural resources intensive pedestrian survey was conducted to determine the location of unknown cultural resources in the Project area. Sites identified during the surveys were documented in detail to allow for the completion of all appropriate Department of Parks and Recreation (DPR) 523 forms.

The survey conducted within the Project Area identified two archaeological isolates (PD-1 and PD-2) as well as four archaeological sites (PD-3, PD-4, PD-5, and PD-6). A previously recorded site, PD-7, is a section of the East Branch of the California Aqueduct.

Sites and isolates PD-1 through PD-6 are not eligible for the CRHR. No further work is necessary for the recorded components of these sites. The East Branch was evaluated as part of a 2009 documentation, for historical significance under the National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHR) criteria as a water conveyance system in California. According to that

evaluation, the East Branch appears eligible for both the NRHP and the CRHR under Criterion 1/A for its association and contribution to the development of water systems in the state of California. In addition, it appears eligible for both the NRHP and the CRHR under Criterion 3/C for its engineering design. As such, previously recorded site P-19-004154 (PD-7) is recommended eligible under the CRHR.

The proposed Project components will affect the East Branch of the California Aqueduct for turnout installation. However, this work does not affect site eligibility under criterion 1. The site still serves its purpose of being a significant reminder of history and current supplier of water for the Los Angeles area. It is still recommended that impacts are mitigated as much as possible during installation and that part time monitoring occur during construction activity on this site.

Buried cultural resources may possibly be affected by the Project, however, the incorporation of management and monitoring protocols will reduce this to less than significant. In addition, the construction of turnout attachments to portions of the East Branch of the California Aqueduct (P-19-004154) will not affect site significance as its integrity as an important historical resource that continues to supply water to the Los Angeles area is maintained.

2021 Revised Project Analysis

An evaluation of the 2021 Revised Project Design's potential impacts to Cultural Resources was conducted in August 2021 (Appendix D).

The analysis identified that the revised design does not change the cultural sensitivity of the Project area because the overall Project location has not changed. The cultural resources known to be present within the Project area are not "significant" cultural resources as identified in the 2017 MND. A Cultural Resources Monitoring and Mitigation Plan for the Project was developed for the original project. The plan contains a set of protective measures that would also apply to the 2021 Revised Project design.

If and when cultural resources are encountered, the Cultural Resources Monitoring and Mitigation Plan currently in place for the Project allows the archaeologist to halt and divert work in the immediate area and initiate procedures so that the resource can be protected, preserved, and evaluated, as described in the existing Cultural Resources Monitoring and Mitigation Plan.

4.4.2 Mitigation Measures

The 2017 MND identified the following mitigation measure to reduce impacts to less than significant:

CR-1: **Cultural Resources Monitoring:** The Project site has been identified to have a low to moderate potential of finding significant archaeological resources lacking surface manifestations that may be encountered during Project construction. To lessen the impact of unknown archeological resources, the Agency will develop a Cultural Resources Monitoring and Mitigation Plan prior to start of ground disturbance. This plan will implement part time monitoring by a qualified archeologist and or a Native American Monitor. In the event that project construction activities result in a finding of significant importance, the qualified archeologist may increase the level of monitoring. If no findings occur during the part time monitoring, the archeologist may further reduce or eliminate the monitoring. During a find of a potentially significant archaeological resource, the

resource will be inventoried and evaluated to ascertain whether the resource meets the criteria for listing on the California Register of Historical Resources. After the discovery, all work being conducted within the vicinity of the discovery will be halted or diverted away from the site of discovery until a qualified archaeologist can assess the potential significance of the find.

CR-2: **Regulation Compliance:** The Agency will comply with Health and Safety Code Section 7050.5, CEQA Section 15064.S(e), and Public Resources Code Section 5097.98, which mandate the process to be followed in the unlikely event of an accidental discovery of any human remains in a location other than a dedicated cemetery.

Revisions to Mitigation Measures:

The 2021 Revised Project Design does not require a modification of the existing measure or the addition of any new measures to reduce impacts to less than significant. Mitigation Measure CR-1 has been met as a *Cultural Resources Monitoring and Mitigation Plan* (Plan) was prepared in July 2020. The Plan as it is presented has been determined to apply to the 2021 Revised Project Design. Neither a second plan nor additional mitigation is required.

4.4.3 Conclusion

The 2021 Revised Project Design does not change the type or extent of development analyzed in the 2017 MND. Applicable mitigation measures previously identified in the 2017 MND will be required as set forth in the MMRP, and no considerably different mitigation measures that may substantially reduce impacts have been identified or rejected. Development of the 2021 Revised Project Design does not propose substantial changes in cultural resources beyond those analyzed in the 2017 MND or require major revisions to the 2017 MND. Therefore, the 2021 Revised Project Design would not involve new significant cultural resource changes or more severe cultural resource impacts than those previously identified and analyzed in the 2017 MND. No additional analysis or mitigation measures are required.

4.5 ENERGY

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
VI. ENERGY: Would the project:					
a) Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	Not Analyzed Less Than Significant	No	No	No	None
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	Not Analyzed Less Than Significant	No	No	No	None

4.5.1 Discussion

An analysis of the energy consumption was not required by the CEQA Guidelines at the time the 2017 MND was prepared. Therefore, the energy consumption was not analyzed as part of the 2017 MND. However, the energy usage was known at the time of the 2017 MND. Therefore, the following discussion represents an analysis of the 2017 energy consumption based on the parameters known for the 2017 Original Design, and how they would have been evaluated if the Energy CEQA criteria were in place at the time of the 2017 MND preparation. Impacts associated with the 2021 Revised Project Design are then evaluated against the 2017 data and analysis to determine if the proposed changes are more severe or there are new circumstances, new information and/or new mitigation necessary.

Summary of 2017 MND

Assumptions for Analysis under Current CEQA Guidelines:

The 2017 Original Design identified that recovery would occur by the use of 18 new groundwater extraction wells designed at approximately 2,500 gallons per minute (gpm) each that will deliver the recovered water back to the California Aqueduct. During wet years with recharge operations, the power usage will be zero. During dry years with recovery operations, wells and pump station may be running continuously. The 2017 MND identified that the recovery operations would have an estimated power use range of of 0 to 2,720,000 kW-hrs per year. The booster station would have an estimated power use range of 0 to 2,380,000 kW-hrs per year. During wet years with recharge operations, the power usage will be zero. During dry years with recovery operations, wells and pump station may be running continuously.

Operation of the bank would require one full time operator and assistant on site. The operator and assistant would travel daily with an assumed light duty (250 hp) pickup truck, 100 miles per day for

operations. There would also be the need for additional staff to assist with berm construction and pipe relocations operations on a periodic basis. This crew is anticipated to travel in one light duty (250 hp) pickup truck with trailer, 100 miles per day, 5 days every four months.

Analysis of 2017 Original Project Design under Current CEQA Guidelines

a) Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

Less Than Significant Impact. Energy consumption is generally evaluated by the project's energy use and by the number of vehicle trips for construction and operations workers. Of all the 2017 Original Project components, energy consumption would be mostly generated during recovery operations by the use of 18 wells and by the need to periodically regrading/re-establish the berms for the recharge basins. Operational trips for maintenance of the wells and booster stations are negligible as they require few vehicles and few trips.

The energy consumption for the recovery operations was identified as 18 new groundwater extraction wells designed at approximately 2,500 gallons per minute (gpm) which would have an estimated power use range of of 0 to 2,720,000 kW-hrs per year. The booster station would have an estimated power use range of 0 to 2,380,000 kW-hrs per year. The energy consumption for the continual re-establishment of the berms for the recharge basins was not identified in the 2017 MND.

Electricity used for the project during construction and operations would be provided by Southern California Edison, which serves more than 15 million customers. SCE derives electricity from varied energy resources including: fossil fuels, hydroelectric generators, nuclear power plants, geothermal power plants, solar power generation, and wind farms. Project-related vehicle trip energy consumption will be predominantly gasoline and diesel fuel. Gasoline (and other vehicle fuels) are commercially provided commodities and would be available to the project patrons and employees via commercial outlets. Therefore, there

The 2017 Original Project does not represent wasteful, inefficient or unnecessary consumption of energy resources primarily because the overall Project purpose is for the public benefit to provide a source of drinking water for the region. The Project is being managed by a public agency, for public benefit, and therefore, the Agency has a fiduciary responsibility to ensure that the Project is designed and operated in the most efficient and cost-effective manner possible. Therefore, the 2017 Original Project does not represent wasteful, inefficient or unnecessary consumption of energy resources. Impacts are less than significant, and no mitigation is required.

b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

Less Than Significant Impact. California has numerous regulations and plans regarding renewable energy and energy efficiency. The regulations and plans primarily target two major sectors: transportation and physical structures.

Transportation aspects of the Project include use of heavy equipment for construction, operations to re-establish berms, and the use of small vehicles for maintenance. The 2017 Original Project Design would not obstruct any state or local plan because the Agency would comply with all regulations for

transportation including use of low-sulfur diesel in construction equipment, proper maintenance of all construction equipment and vehicles, and maintaining access roads in good condition throughout the site to ensure fuel consumption efficiency. Regarding building construction, the structure that would house the booster pump station would be designed and constructed consistent with the latest design standards, which includes Title 24 that requires the structure to be constructed with reduced energy consumption features.

Therefore, the 2017 Original Project does not Conflict with or obstruct a state or local plan for renewable energy or energy efficiency. Impacts are less than significant, and no mitigation is required.

2021 Revised Project Analysis

The need for continual re-establishment of the recharge basins was eliminated as the 2021 Revised Project Design includes engineered berms, hardened to protect them from localized flooding.

The number of wells was also increased from 18 to 28 in the new design, however, the new wells will operate at only 1,800 to 2,200 gpm which. The increase in the number of wells at a lesser power rate represents an increase in flexibility, location and timing for recovery.

The 2021 Revised Project Design does not represent wasteful, inefficient or unnecessary consumption of energy resources primarily because the overall Project purpose is for the public benefit to provide a source of drinking water for the region. The Project is being managed by a public agency, for public benefit, and therefore, the Agency has a fiduciary responsibility to ensure that the Project is designed and operated in the most efficient and cost-effective manner possible. Therefore, the 2021 Revised Project Design does not represent wasteful, inefficient or unnecessary consumption of energy resources. Impacts are less than significant, and no mitigation is required.

4.5.2 Mitigation Measures

No mitigation measures are required for the 2017 Original Project Design had energy resources been evaluated in the 2017 MND. The 2021 Revised Project Design also does not require the addition of any measures to reduce impacts to less than significant.

4.5.3 Conclusion

The proposed Project does not change the type or extent of development analyzed in the 2017 MND. Implementation of the 2021 Revised Project Design does not propose substantial energy changes beyond those analyzed in the 2017 MND or require major revisions to the 2017 MND. Therefore, the 2021 Revised Project Design would not involve new significant energy impacts or more severe energy impacts than those previously identified and analyzed in the 2017 MND. No additional analysis or mitigation measures are required.

4.6 GEOLOGY AND SOILS

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
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:	Less Than Significant With Mitigation Incorporated	No	No	No	GEO-2, GEO-3, GEO-4
• 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.					
• Strong seismic ground shaking?					
• Seismic-related ground failure, including liquefaction?					
• Landslides?					
b) Result in substantial soil erosion or the loss of topsoil?	Less Than Significant With Mitigation Incorporated	No	No	No	GEO-1
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- site or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	Less Than Significant With Mitigation Incorporated	No	No	No	GEO-4
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	Less Than Significant	No	No	No	None

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
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?	Less Than Significant	No	No	No	None
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	Less Than Significant	No	No	No	CR-2

4.6.1 Discussion

Summary of 2017 MND

Faults and seismic concerns. The 2017 MND identified that the Project location is in an area of relatively high seismic activity. The Garlock fault along the Tehachapi Mountains lies approximately 9 miles north of the Project site. The San Andreas Fault along the San Gabriel Mountains lies approximately 4 miles south of the Project site. None of these fault zones crosses any of the facilities proposed for the Project. The Garlock and San Andreas faults are designated as Fault-Rupture Hazard Zones under the Alquist-Priolo Fault Zoning Act. The Project facilities would not be within any currently designated Fault Rupture Hazard Zones. The general Project area has been subject to intense ground shaking from nearby fault ruptures, particularly on the San Andreas Fault and on faults near the juncture of the San Andreas and Garlock faults. Mitigation measures to ensure facilities would be constructed to withstand earthquakes were identified.

Liquefaction. The MND identified that typically liquefaction potential is a concern when depth to groundwater is about 30 feet but much less when groundwater is at 50 feet. Groundwater depth in the proposed Project area varies, but based on recent measurements groundwater levels in the Project area range from 280 to 300 feet below ground surface. The potential for liquefaction to adversely affect human safety is related to liquefaction potential and the proximity of development to areas of high groundwater. Residential uses exist approximately one-half mile south and approximately 2 miles east of the Project site. Because the Project involves recharge which could raise water levels in the Project vicinity, mitigation measures were identified to reduce potential impacts from liquefaction on the surrounding residences.

Landslides. The Project area is flat and there is no to less than significant impacts from landslides, according to the 2017 MND.

Soil Erosion. The 2017 MND identified that soils of the alluvial plain of the Antelope Valley are highly susceptible to water and/or wind erosion. Erosion could occur typically during grading in periods of winds in excess of about 10 miles per hour, during construction of the berms and during excavation for pipelines.

Some loss of soil could also occur during annual reconstruction of berms. A mitigation measure is required to reduce potential impacts from soil loss to less than significant.

Expansive Soils. The 2017 MND identified that the Project area soils have low or low-to-moderate shrink/swell potential. The same Agency designates the site as having no limitations for site development (building of structures) for about 70% of the site on the southern end of the property and some limitations on the remaining 30% of the land on the northern end. With the exception of construction of some wells, the Agency does not anticipate constructing any permanent structures on the northern end of the property.

Paleontological Resources. This criterion was addressed in the 2017 MND under Section 2.6 Cultural Resources. This criterion was moved to Section VII in the 2019 CEQA Guidelines revisions. Section 2.6 of the 2017 MND identified that the Project has a potential to uncover buried resources and human remains. Mitigation measures were identified to reduce potential impacts to less than significant.

2021 Revised Project Analysis

Faults and seismic concerns. The Project will be constructed in the same location, which is subject to seismic events. Mitigation measures to ensure facilities would be constructed to withstand earthquakes were identified in the 2017 MND. Because the facility will be constructed in the same location with the same seismic event risk, no further mitigation is necessary with the 2021 Revised Project.

Liquefaction. The quantify of the recharged water will be the same as that identified in the 2017 Original MND, so there is the same potential impact to liquefaction by raising water levels in the Project vicinity, as identified with the 2017 MND. Therefore, the mitigation measures identified in the 2017 MND also apply to the 2021 Revised Project and will reduce potential impacts from liquefaction on the surrounding residences

Soil Erosion. Relative to soil erosion potential, the 2021 Revised Project design identifies the use of compacted, engineered berms, unlike the 2017 Original Design in which berms were more loose to naturally trap soil. Berm heights of the original design were approximately 3 feet high whereas berm heights in the revised design are approximately 6 feet high. Therefore, there is similar to less than significant impact to soil erosion during operations for the revised design. As such some loss of soil could also occur during construction of the berms, as identified in the 2017 MND. The mitigation measure identified in the 2017 MND also applies to the 2021 Revised Design to reduce potential impacts from soil loss to less than significant.

Expansive Soils. The 2021 Revised Project design proposes to only construct wells on the Project site, and has eliminated the enclosure for the booster pump station. Therefore, the conditions are similar to the 2017 Original Project design, and no further analysis or mitigation is required.

Paleontological Resources. The Project will be constructed in the same overall location as identified in the 2017 MND. Section 2.6 of the 2017 MND identified that the Project has a potential to uncover buried resources and human remains. Mitigation measures were identified to reduce potential impacts to less than significant, and those mitigation measures are also applicable to the 2021 Revised Project.

4.6.2 Mitigation Measures

The 2017 MND identified the following mitigation measure to reduce impacts to less than significant:

GEO-1 **SWPPP** - To control water and wind erosion during construction and operation of the Project, the Agency will prepare a Stormwater Pollution Prevention Plan (SWPPP) in compliance with the requirements of the National Pollutant Discharge Elimination System (NPDES) Construction General Permit.

GEO-2 **Seismic Design** - Although the proposed Project has little inherent potential for causing seismic safety effects, the Agency will ensure that all facilities are designed to withstand the anticipated seismic forces, consistent with local and State building codes and relevant regulations.

GEO-3 **Pipeline Shut Off Valves -** The Agency will install shut off valves on major pipelines to minimize the potential for flooding during seismic events.

GEO-4 **Groundwater Monitoring Plan -** Although the potential for the Project to raise groundwater levels to within 30 to 50 feet of the ground surface is small, to address potential impacts to local groundwater levels, the Agency will develop a monitoring program to monitor changes in water levels in the area affected by groundwater recharge operations. If monitoring identifies groundwater level rise to 75 feet below ground surface, the Agency will modify management of recharge to prevent water levels from rising to levels where liquefaction effects could occur. The Groundwater Monitoring Plan will also include provisions for monitoring of groundwater quality and the development of a native groundwater quality baseline which would be identified prior to commencement of recharge operations.

CR-2: **Regulation Compliance:** The Agency will comply with Health and Safety Code Section 7050.5, CEQA Section 15064.S(e), and Public Resources Code Section 5097.98, which mandate the process to be followed in the unlikely event of an accidental discovery of any human remains in a location other than a dedicated cemetery.

Revisions to Mitigation Measures:

The 2021 Revised Project Design does not require a modification of the existing measures or the addition of any new measures to reduce impacts to less than significant.

4.6.3 Conclusion

The 2021 Revised Project Design does not change the type or extent of development analyzed in the 2017 MND. Applicable mitigation measures previously identified in the 2017 MND will be required as set forth in the MMRP, and no considerably different mitigation measures that may substantially reduce impacts have been identified or rejected. The 2021 Revised Project Design does not propose substantial changes to geology and soils beyond those analyzed in the 2017 MND or require major revisions to the 2017 MND. Therefore, the 2021 Revised Project Design would not involve new significant or more severe geology and

soils impacts than those previously identified and analyzed in the 2017 MND. No additional analysis or mitigation measures are required.

4.7 GREENHOUSE GAS EMISSIONS

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
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?	Less Than Significant	No	No	No	None
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	Less Than Significant	No	No	No	None

4.7.1 Discussion

Summary of 2017 MND

The AVAQMD CEQA and Federal Conformity Guidelines have established a significance threshold of 100,000 tons CO2e per year or a daily threshold of 548,000 pounds CO2e where AVAQMD is the lead agency. The 2017 MND identified that heavy duty off road equipment, materials transport, and worker commutes during construction of the Project would result in exhaust related GHG emissions. During operation, direct emissions would result from vehicle trips and area sources. Total construction and operational GHG emissions were estimated in the 2017 MND to be less than the AVAQMD CEQA thresholds, therefore, the impacts were less than significant.

Polices formulated under the mandate of AB 32 and SB 32 that are applicable to construction-related activity, either directly or indirectly, would be implemented during construction of the project if those policies and laws are developed before the commencement of project construction. Therefore, it is assumed that project construction would not conflict with any applicable plans or policies, and the impacts are less than significant.

2021 Revised Project Analysis

The potential greenhouse gas emissions were analyzed in Appendix B. Total construction GHG emissions for the 2021 Revised Project are below both AVAQMD's thresholds of 100,000 MTCO2e per year and 548,000 pounds CO2e per day for all land uses and therefore, the impact is less than significant. The emissions were calculated using Mitigation Measure AQ- 1, which requires the use of off-road construction diesel engines that meet Tier 4 interim California Emission.

There have been no changes to applicable GHG plans and policies since the time of the 2017 MND analysis. Implementation of the 2021 Revised Project would also be required to comply with all applicable plans and policies, as with the 2017 Original Project design. Therefore, there is no change in this analysis.

4.7.2 Mitigation Measures

There were no mitigation measures identified in the 2017 MND, and the 2021 Revised Project Design does not require the addition of any new measures to reduce impacts to less than significant.

4.7.3 Conclusion

The 2021 Revised Project Design does not change the type or extent of development analyzed in the 2017 MND. Implementation of the 2021 Revised Project Design does not propose substantial GHG emissions beyond those analyzed in the 2017 MND or require major revisions to the 2017 MND. Therefore, the 2021 Revised Project Design would not involve new significant or more severe GHG impacts than those previously identified and analyzed in the 2017 MND. No additional analysis or mitigation measures are required.

4.8 HAZARDS AND HAZARDOUS MATERIALS

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
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?	Less Than Significant With Mitigation Incorporated	No	No	No	HAZ-1
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?	Less Than Significant With Mitigation Incorporated	No	No	No	HAZ-4
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	Less Than Significant	No	No	No	None
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?	Less Than Significant	No	No	No	None
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	Less Than Significant With Mitigation Incorporated	No	No	No	HAZ-2 and HAZ-3

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
~~f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?~~	Less Than Significant	(NA - Removed from Guidelines)	NA - Removed from Guidelines)	NA - Removed from Guidelines)	NA - Removed from Guidelines)
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	Less Than Significant	No	No	No	None
g) Expose people or structures, either directly or indirectly to a significant risk of loss, injury or death involving wildland fires? ~~including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?~~	Less Than Significant	No	No	No	None

4.8.1 Discussion

Summary of 2017 MND

The Project is not located near a school or on a hazardous waste site. Additionally, the Project would not interfere with an emergency response plan or expose people or structures to wildland fires. Therefore, the 2017 MND identified that these impacts were less than significant.

During construction and operation of the proposed Project facilities, hazardous materials such as fuels and lubricants will be used and have the potential to be released into the environment, causing environmental and/or human exposure to these hazards. Though given the small quantity and the remote nature of the project area, any effects would be less than significant, although the 2017 MND identified a mitigation measure to ensure less than significant impacts.

Because the recharge basins will retain water, the Project has the potential to attract and breed mosquitos and birds. Mosquitos can carry diseases, and residences are located within one-half mile to the south and approximately 2 miles to the east. As such a mitigation measure was required to reduce potential mosquito breeding.

The Project is also located in an area associated with low level (200 to 1,500 feet) military flight paths for Edwards Air Force Base. The 2017 MND cited a Tulare Lake Drainage District (TLDD) study that found that shorebirds such as avocets and stilts have been found to use the shallow-water (generally 0 to 12 inches in depth with gently sloping upland habitat) created by TLDD in managing its system of drainage ponds.

The shallow-water areas did not attract small birds such as doves and larks. At the same time, deeper ponds were found to be used by a variety of ducks.

The 2017 MND concluded that based on the Project type, the recharge areas will not likely attract larger birds such as ducks, geese, and swans but that there is some potential to attract smaller shorebirds. In the Lancaster Palmdale Edwards Air Force Base area, there were no bird strikes recorded in the National Wildlife Strike Database for ducks, geese, swans, hawks, eagles, vultures, falcons, ravens, or gulls. There was also no bird strikes associated with shorebirds. The database does have records of strikes on pigeons, doves, swifts, larks, and sparrows. This is consistent with Edwards AFB bird/aircraft strike hazard (BASH) data suggesting most bird strikes are of small birds and occur near the runways and during low-altitude flight. As such, the 2017 MND identified measures to minimize potential impacts to Edwards Air Force Base during the recharge operations.

2021 Revised Project Analysis

The Project is in the same location and will be constructed as the original project was analyzed by the 2017 MND. Recharge operations will occur in a variety of basins, as assumed by the 2017 MND, and therefore poses a similar attractant for mosquitos and birds.

4.8.2 Mitigation Measures

The 2017 MND identified the following mitigation measure to reduce impacts to less than significant:

HAZ-1 Spill Prevention Plan - Consistent with Agency's existing practices, the Agency will require from its construction contractors the preparation and implementation of a Spill Prevention Control and Countermeasures Plan (SPCCP) to minimize the potential for, and effects from, spills of hazardous, toxic, or petroleum substances during construction activities and operations. The plan and methods shall be in conformance with all State and Federal regulations. The Agency shall provide for routine inspection of the construction and operations areas to verify that the measures specified in the SPCCP are properly implemented and maintained and further ensure that contractors are notified immediately if there is a noncompliance issue and will require compliance.

HAZ-2 Bird Strike Hazard Notification - The Agency will notify the Flight Safety Office at Edwards Air Force Base and all local airports of the potential bird strike hazard as follows:

- Prior to application of water to the recharge basins, and
- If large birds or large concentrations of small birds are observed in or near the recharge area.

HAZ-3 Bird Strike Hazard Minimization Measures - The Agency will implement actions to reduce the attractiveness of the recharges basins to birds by:

- Use of recharge basins with shallow water depths which will be generally unsuitable for the larger migratory birds.

- Monitor recharge area water and if aquatic macroinvertebrates are found to be developing in large numbers and/or foraging by shorebirds is observed, temporarily dry out recharge areas, thereby reducing the insect and aquatic macroinvertebrate forage that would attract and hold shorebirds.

- Whenever water is present in the recharge basins, the project operator will monitor the basins daily for bird activity and if found discourage their use via means acceptable to the Department of Fish and Wildlife.

HAZ-4 Mosquito Borne Disease Minimization Measures – The Agency will consult with the Antelope Valley Mosquito and Vector Control District to develop and implement a mosquito management plan. The plan would consist of a Project specific mosquito abatement program that would include quantitative abatement thresholds. The Agency and/or its representative would monitor mosquito larvae production in the recharge basins, drainages, and distribution. Larvae populations would be tracked using methods and thresholds approved by the Mosquito Abatement District, and suppression measures would be employed when thresholds are exceeded. The primacy mode of suppression would be to monitor for mosquito presence and if mosquito larvae are found, to cycle recharge temporarily so that units of recharge would be dried.

Revisions to Mitigation Measures:

The 2021 Revised Project Design does not require a modification of the existing measures or the addition of any new measures to reduce impacts to less than significant.

4.8.3 Conclusion

The 2021 Revised Project Design does not change the type or extent of development analyzed in the 2017 MND. Applicable mitigation measures previously identified in the 2017 MND will be required as set forth in the MMRP, and no considerably different mitigation measures that may substantially reduce impacts have been identified or rejected. The 2021 Revised Project Design does not propose substantial changes to hazards and hazardous materials beyond those analyzed in the 2017 MND or require major revisions to the 2017 MND. Therefore, the 2021 Revised Project Design would not involve new significant or more severe hazards or hazardous materials impacts than those previously identified and analyzed in the 2017 MND. No additional analysis or mitigation measures are required.

4.9 HYDROLOGY AND WATER QUALITY

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
X. HYDROLOGY AND WATER QUALITY: Would the project:					
a) Violate any water quality standards or waste discharge requirements <u>or otherwise substantially degrade surface or ground water quality</u>?	Less Than Significant With Mitigation Incorporated	No	No	No	HWQ-4
b) Substantially ~~deplete~~ decrease groundwater supplies or interfere substantially with groundwater recharge <u>such that the project may impede sustainable groundwater management of the basin</u> ~~there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)~~?	Less Than Significant With Mitigation Incorporated	No	No	No	HWQ-4
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, <u>or through the addition of impervious surfaces</u>, in a manner which would:	Less Than Significant With Mitigation Incorporated (also applies to all subcriteria)	No (also applies to all subcriteria)	No (also applies to all subcriteria)	No (also applies to all subcriteria)	HWQ-1, HWQ-2, HWQ-3, HWQ-5 (also applies to all subcriteria)
• result in substantial erosion or siltation onsite or offsite;					
• substantially increase the rate or amount of surface water runoff in a manner which would result in flooding on or offsite;					

Environmental Subject Area	**Conclusion in 2017 MND**	**Do the Proposed Changes Involve New or More Severe Impacts?**	**New Circumstances Involving New or More Severe Impacts?**	**New Information Requiring New Analysis or Verification?**	**Mitigation Measures**
• create or contribute to runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or					
• impede or redirect flood flows?					
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	Less Than Significant	No	No	No	None
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	Less Than Significant	No	No	No	None
~~d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?~~	Refer to Criterion X(c)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)
~~e) 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?~~	Refer to Criterion X(c)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)
~~f) Otherwise substantially degrade water quality?~~	Refer to Criterion X(a)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)
~~g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?~~	Refer to Criterion X(c)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
~~h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?~~	Refer to Criterion X(c)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)
~~i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?~~	Refer to Criterion X(c)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)
~~j) Inundation by seiche, tsunami, or mudflow?~~	Refer to Criterion X(c)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)

4.9.1 Discussion

Summary of 2017 MND

Water Quality. The 2017 MND identified that the SWP water would be blended with the regional groundwater as it is absorbed into the ground. Based on various testing data, both recharged water and indigenous water are generally suitable for drinking water purposes. Considering that the blending of the indigenous and SWP water supplies is not likely to change the water quality significantly such that it would result in concentrations above the Maximum Contaminant Levels (MCLs), operations related to groundwater recovery and delivery of the recovered water back to the California Aqueduct are not anticipated to cause any adverse impact. No external treatment system is needed for either the SWP supply or the groundwater. The 2017 MND identified that the Agency will work with and comply with DWR's requirements in the development and implementation of a pump in program including monitoring of water quality of water being pumped into the Aqueduct.

The 2017 MND identified that recharge operations have the potential to raise groundwater levels to where it may interfere with the few septic systems in the surrounding. Mitigation was implemented to monitor and change recharge operations as necessary to maintain the groundwater level below 75 ft. (100 ft is the level considered a greater risk of nitrate contamination).

Groundwater Supplies and Recharge: The 2017 MND identified that groundwater recharge will generally raise groundwater levels when compared to no project conditions and will benefit adjacent private well owners by reducing the cost of pumping supplies. The 2017 MND also identified that the Agency's recovery operations during drought may result in lower water levels in nearby wells and localized declines in water levels may reduce well production somewhat and raise well pumping costs. Mitigation was required to ensure that net extractions of groundwater by the Agency and its partners will not exceed 90 percent of the volume of water recharged.

Change in Drainage Patterns. The Project site has seven major tributary streams. The slope of the land in the vicinity of project drains from southwest to east. The Project would preserve existing topography and not significantly alter existing drainage patterns.

The 2017 MND identified that "a typical recharge program, involving the construction of large, permanent berms to retain flow would result in a significant change in the drainage patterns in the area and in particular would preclude flood flows from passing through the recharge area, thus diverting flows to adjacent properties." The 2017 Original project design proposed not to isolate the site from flood flows but, instead, the design would utilize flood irrigation methods to where only temporary berms of not greater than about 36 inches in height would be installed to retain some stormwater for recharge, but in general, be sacrificial, or wash away, to mimic natural flood conditions. Drainage flows would enter the recharge area, temporarily be constrained by the low berms, and then overtop and flow from one berm to the next until breaching the last berm on the eastern end of the property. A beneficial effect of the sacrificial berms was identified as that it would temporarily detain flood flows, allow for some percolation of these flows into the ground, and then allow flow to exit the site in a manner similar to pre-project conditions. Berms will also retain and recharge low flow storm runoff.

Consistency with Groundwater Plans. The 2017 MND identified that the Project (a) does not affect the beneficial use of the stored supplies, at any blend of SWP and indigenous groundwater and (b) has somewhat greater benefits than adverse impacts associated with mass loading of minerals as the concentration (mg/l) in the blended water is such that it does not change the intended beneficial use of the water.

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Water Quality. The SWP water would still be blended with the regional groundwater as it is absorbed into the ground, and there is no change to this feature. The 2017 MND identified that the SWP and the regional groundwater are compatible, and neither need treatment. A rise in groundwater is also anticipated with the revised project design, and operations will be adjusted as needed based on monitoring as with the original design. Therefore, there is no change.

Groundwater Supplies and Recharge: The recharge operations will also generally raise groundwater levels when compared to no project conditions, creating the same benefit of reduced pumping costs for adjacent private well owners. Additionally, the Agency's recovery operation during drought may also result in lower water levels in nearby wells and localized declines in water levels may reduce well production somewhat and raise well pumping costs. Mitigation was required to reduce potential impacts to adjacent private wells, and the revised design incorporates the monitoring requirement.

Change in Drainage Patterns. The Project site has seven major tributary streams. The 2017 MND identified that "a typical recharge program, involving the construction of large, permanent berms to retain flow would result in a significant change in the drainage patterns in the area and in particular would preclude flood flows from passing through the recharge area, thus diverting flows to adjacent properties." The 2021 Revised Project Design constitutes a "typical recharge program…" as described by the 2017 MND.

However, a Drainage Evaluation was prepared for the 2021 Revised Project Design (Appendix E) that further defined flood flow across the Project site. The revised design focuses the fixed basins outside of

the areas where storm flows are heaviest and provides protection for some of the basins, removing the sacrificial nature of the basins. As such, the basin placement throughout the Project area are designed in a manner that will still allow the main flood flows to pass through the Project area, continuing in normal patterns, and not divert flows onto adjacent properties.

The 2021 Revised Project Design constitutes a hybrid recharge program with some "typical" basins and some sacrificial basins. A Drainage Evaluation was prepared for the 2021 Revised Project Design (Appendix E) that defined flood flow across the Project site. The revised design focuses the fixed basins outside of the areas where storm flows are heaviest and provides protection for these basins, removing the sacrificial nature of these basins. Basins within the floodways will remain as sacrificial as intended in the original design. As such, the basin placement throughout the Project area is designed in a manner that will still allow the main flood flows to pass through the Project area, continuing in normal patterns, and not divert flows onto adjacent properties. Flood flows will still enter the sacrificial berm area, recharge during small storm events, and overtop the berms in larger storm events. Sheet flows will likely not enter the flood protected basins.

Consistency with Groundwater Plans. The 2017 MND identified that the Project (a) does not affect the beneficial use of the stored supplies, at any blend of SWP and indigenous groundwater and (b) has somewhat greater benefits than adverse impacts associated with mass loading of minerals as the concentration (mg/l) in the blended water is such that it does not change the intended beneficial use of the water.

4.9.2 Mitigation Measures

The 2017 MND identified the following mitigation measure to reduce impacts to less than significant:

HWQ-1 **Drainage Design** - Recharge areas will be constructed so that they will not divert sheet flooding and other runoff away from the recharge areas. This will allow flood water to flow into the recharge areas where flows will be somewhat retarded by the recharge berms. Berms will be designed with berm heights below the calculated flood depth elevations and intended to be sacrificial. Flood flows would enter the site, go through the berms, overtop or destroy the berms in sequence, and eventually exit the project site along the eastern boundary of the proposed project in a manner similar to pre-project conditions.

HWQ-2 **Stormwater Pollution Prevention Plan (SWPPP)** - To reduce or eliminate Construction related water quality effects, before onset of any construction activities, the Agency or its contractor will prepare a Storm Water Pollution Prevention Plan. The SWPPP will include temporary erosion control measures (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover). These measures will be employed to control erosion from disturbed areas. Measures for the control of pollutants during construction include:

- Use of existing access points to minimize dust and tracking materials onto Public Streets,

- Designated Parking, Storage, and Service Areas protected by silt fence and oil absorbents and sloped to control drainage,
- Minimize diesel storage,
- Stockpile spill cleanup materials,
- Regular vehicle inspection for leaks.
- Fuel off-channel with a secondary containment system for spills,
- Use quick connects whenever possible,
- Fueling by authorized personnel only, and
- Spill cleanup materials readily available.

The SWPPP shall include a Fugitive Dust Control Plan (FDCP) that will include extensive measures to control and manage soil erosion. The FDCP will provide for management of open soils that will contribute to management of runoff.

Consistent with the SWPPP and the Agency's current construction management practices, the Agency or its agent will perform routine inspections of the construction area to verify that the BMPs specified in the SWPPP are properly implemented and maintained. The Agency will notify its contractors immediately if there is a noncompliance issue and will require compliance.

HWQ-3 **Spill Prevention Plan** - Consistent with Agency's existing practices, the Agency will require from its construction contractors the preparation and implementation of a Spill Prevention Control and Countermeasures Plan (SPCCP) to minimize the potential for, and effects from, spills of hazardous, toxic, or petroleum substances during construction activities and operations. The plan and methods shall be in conformance with all State and Federal regulations. The Agency shall provide for routine inspection of the construction and operations areas to verify that the measures specified in the SPCCP are properly implemented and maintained and further ensure that contractors are notified immediately if there is a noncompliance issue and will require compliance.

HWQ-4 **Protection of Off Site Wells**. To address potential impacts to groundwater and adjacent well owners, the Agency will develop a monitoring program to monitor changes in water levels and well production in the area affected by groundwater recharge operations. The program will specify that:

- Extractions of groundwater shall not exceed 90% of the amount of water recharged,
- Water quality in recovered water and in groundwater flowing away from the Project will be monitored to ensure that water quality remains appropriate for designated beneficial uses,

- During recharge operations, water levels will be monitored and recharge operations will be suspended in the event that offsite water levels rise to within 75 feet of the ground surface, and

- During recovery operations, water levels in offsite wells will be monitored and operations will be adjusted if offsite wells are found to be adversely affected by project operations,

HWQ-5 **Management of Herbicides and Pesticides** - The Agency will comply with all regulations of the California Department of Pesticide Regulation regarding the use of herbicides and pesticides in areas designated for groundwater recharge.

Revisions to Mitigation Measures:

Due to the design change, the following mitigation measure is revised/clarified:

HWQ-1 Recharge areas in Pescado Creek and Oso Canyon floodways will be constructed so that they will not divert sheet flooding and other runoff away from the low, earthen berms that will be constructed within the creek areas that will be used to enhanced the fixed recharge areas. This will allow flood water to flow into the creek areas ~~recharge areas~~ where flows will be somewhat retarded by the recharge berms. Berms will be designed with berm heights below the calculated flood depth elevations and intended to be sacrificial. Flood flows would enter the site, be primarily channeled through the floodways go through the berms that are installed within the floodways, overtop or destroy the berms in sequence, and eventually exit the project site along the eastern boundary of the proposed project in a manner similar to pre-project conditions.

The intent of this mitigation measure was that storm flow/flood flow be channeled throughout the entire 1,200 acre site, including Pescado Creek and Oso Canyon floodways, would mimic agricultural type flooding, and the same amount of flow that enters the site would also exit the project site. However, during final design, it was discovered that the same berms that were designed to hold SWP water recharge would be sacrificed in a flooding event, thereby potentially significantly increasing the amount of water that would be exiting the project site. The 2021 Revised Design channels the flood flow in a manner that protects the water recharge areas, therefore, the same amount of water would enter and exit the project site. The sacrificial berms that will be placed within the Pescado Creek and Oso Canyon floodway serve to not only retard flows but also attempt to provide additional recharge opportunities. These sacrificial berms would be restored after the flood event. Therefore, the modification required to HWQ-1 to reflect the current design also meets the intent of the original HWQ-1 in that it ensures no additional flows exit the site and in a manner that is similar to pre-project conditions.

Other than a modification to HWQ-1 which is consistent with the intent of the original HWQ-1, the 2021 Revised Project Design does not require a modification of any of the other existing measures or the addition of any new measures to reduce impacts to less than significant.

4.9.3 Conclusion

The 2021 Revised Project Design does not change the type or extent of development analyzed in the 2017 MND. Applicable mitigation measures previously identified in the 2017 MND will be required as set forth in the MMRP, and no considerably different mitigation measures that may substantially reduce impacts have been identified or rejected. The 2021 Revised Project Design does not propose substantial changes to hydrology and water quality materials beyond those analyzed in the 2017 MND or require major revisions to the 2017 MND. The modifications made to mitigation measure HWQ-1 are clarifications and as relevant to the 2021 Revised Project and are not significant. Therefore, the 2021 Revised Project Design would not involve new significant or more severe hydrology and water quality materials impacts than those previously identified and analyzed in the 2017 MND. No additional analysis or mitigation measures are required.

4.10 NOISE

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
XIII. NOISE: Would the project result in:					
a) ~~Exposure of persons to or g~~ 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?	Less Than Significant With Mitigation Incorporated	No	No	No	NOISE-1, NOISE-2
b) ~~Exposure of persons to or g~~ Generation of excessive groundborne vibration or groundborne noise levels?	Less Than Significant With Mitigation Incorporated	No	No	No	NOISE-1, NOISE-2
~~c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project~~	Refer to Criterion XIII(a)	(N/A – Guidelines Revised	(N/A – Guidelines Revised	(N/A – Guidelines Revised	(N/A – Guidelines Revised
~~d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?~~	Refer to Criterion XIII(a)	(N/A – Guidelines Revised	(N/A – Guidelines Revised	(N/A – Guidelines Revised	(N/A – Guidelines Revised
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?	No Impact	No	No	No	None
~~f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?~~	Refer to Criterion XIII(c)	(N/A – Guidelines Revised	(N/A – Guidelines Revised	(N/A – Guidelines Revised	(N/A – Guidelines Revised

4.10.1 Discussion

Summary of 2017 MND

The Project area is surrounded by undeveloped land. There are about 7 isolated residential homes near the eastern boundary of the Project. There are two rural residential developments near the project area. One is located about 1/2-mile south of the California Aqueduct and the second one consisting of the community of Neenach is located about 2 miles east of the Project's eastern boundary. There are no existing sources of excessive noise in the area. Highway traffic is sparse, and many of the local roads are unpaved. Traffic noise is not a current problem. With the exception of seasonal exposure to noise of agricultural operations, ambient noise levels in the area are typical of rural areas.

Construction and operations of the Project may exceed the Los Angeles County threshold of 75 dBA during day time hours during various activities for less than 5 residences abutting the eastern boundary of the project area, in the vicinity of 280th St. West. Berm construction and maintenance would involve the use of a typical agricultural tractor and or a small scraper and water truck. Noise associated with berm construction would not differ from the noise associated with agricultural operations. However, mitigation measures were identified to ensure construction and operations noise would be less than significant.

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The Project is located in the same area as assessed in the 2017 MND. Construction and operations noise from the revised Project also has the potential to impact residents in the southeastern portion of the site, in the vicinity of 280th St. West. And though recharge basins are proposed for the southeastern portion of the site under the revised design and were not proposed in the original design, mitigation measures were imposed that would ensure construction and operations noise remained less than significant. These measures are applicable to the revised design.

4.10.2 Mitigation Measures

The 2017 MND identified the following mitigation measure to reduce impacts to less than significant:

NOISE-1 Construction Noise Monitoring and Minimization Measures – The Agency and its construction contractors will monitor noise levels for construction activities near and along 280th Street West corresponding to the eastern boundary of the proposed Project area which includes potential noise receptors (residential homes). In the event that noise levels exceed the County of Los Angeles designated thresholds, the construction contractor will implement noise reduction measures to include:

- Providing construction equipment with sound control devices.
- With the exception of well drilling operations, restrict construction activities to day time hours.
- In the event that construction activities occur close to sensitive noise receptors, implementing appropriate additional noise mitigation measures, including but not limited to:
    - Changing the location of stationary construction equipment,

- Shutting off idling equipment,
- Rescheduling construction activity
- Notifying adjacent residents in advance of construction work, and
- Installing acoustic barriers around stationary construction noise sources.

NOISE-2 Operation Noise Minimization Measures – The Agency proposes to construct approximately 7 groundwater wells in the vicinity of 280th St. West which have the potential to increase the ambient noise level for the nearby residential homes on the east side of 280th St. West during groundwater recovery operations. The Agency proposes to equip these wells with insulated well enclosures that will reduce the operational noise level in the area to less than significant.

Revisions to Mitigation Measures:

Due to the design change, the following mitigation measure is revised/clarified:

NOISE-2 Operation Noise Minimization Measures – The Agency proposes to construct approximately ~~7~~ 6 groundwater wells in the vicinity of 280th St. West which have the potential to increase the ambient noise level for the nearby residential homes on the east side of 280th St. West during groundwater recovery operations. The Agency proposes to equip these wells with insulated well enclosures that will reduce the operational noise level in the area to less than significant.

The intent of this mitigation measure was to ensure monitoring along the area of 280th Street West, which have nearby residents. The 2021 Revised Design reduces the number of wells to six, form the seven originally proposed, along 280th Street West. Therefore, the modification required to Noise-2 to reflect the current design also meets the intent of the original Noise-2 in that it ensures noise monitoring for the wells along a potentially sensitive residential area.

Other than a modification to Noise-2 which is consistent with the intent of the original Noise-2, the 2021 Revised Project Design does not require a modification of any of the other existing measures or the addition of any new measures to reduce impacts to less than significant.

4.10.3 Conclusion

The 2021 Revised Project Design does not change the type or extent of development analyzed in the 2017 MND. Applicable mitigation measures previously identified in the 2017 MND will be required as set forth in the MMRP, and no considerably different mitigation measures that may substantially reduce impacts have been identified or rejected. The 2021 Revised Project Design does not propose substantial changes to noise levels beyond those analyzed in the 2017 MND or require major revisions to the 2017 MND. Therefore, the 2021 Revised Project Design would not involve new significant or more severe noise impacts than those previously identified and analyzed in the 2017 MND. No additional analysis or mitigation measures are required.

4.11 TRANSPORTATION

It should be noted that there were no significant transportation or traffic impacts or mitigation identified in the 2017 MND, and the 2021 Revised Project has similar traffic characteristics as the 2017 Original Project. However, there were significant revisions to the Transportation section of the Guidelines, and therefore, this Environmental Subject Area is included for completeness of this Addendum.

Environmental Subject Area	**Conclusion in 2017 MND**	**Do the Proposed Changes Involve New or More Severe Impacts?**	**New Circumstances Involving New or More Severe Impacts?**	**New Information Requiring New Analysis or Verification?**	**Mitigation Measures**
XVII. TRANSPORTATION~~/TRAFFIC~~: Would the project:					
a) Conflict with a~~n applicable~~ program plan, ordinance or policy ~~establishing measures of effectiveness for the performance of~~ addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?~~taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?~~	Less Than Significant	No	No	No	None
b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)~~(1)~~? ~~Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?~~	Not Analyzed No Impact	No	No	No	None
~~c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?~~	Less Than Significant With Mitigation Incorporated	N/A – Removed from Guidelines, Refer to Section IX(e)	N/A – Removed from Guidelines, Refer to Section IX(e)	N/A – Removed from Guidelines, Refer to Section IX(e)	HAZ-2, HAZ-3

c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	No Impact	No	No	No	None
d) Result in inadequate emergency access?	No Impact	No	No	No	None
~~f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?~~	Refer to Criterion XVII(a)				

4.11.1 Discussion

This Environmental Subject Area underwent major revisions since the adoption of the 2017 MND. While most of the revisions represent combining multiple individual criterion into single criterions for evaluation, the major revision was to Criterion XVII(b). CEQA Guidelines Section 15064.3 provides that transportation impacts of projects are, in general, best measured by evaluating the project's vehicle miles traveled (VMT). Automobile delay (often called Level of Service) will no longer be considered as an environmental impact under CEQA, which is reflected in this revised criterion.

The Los Angeles County Public Works Transportation Impact Analysis Guidelines (July 23, 2020) sets forth the criteria for evaluating VMT. Based on the County's Guidelines, the High Desert Water Bank is exempt from having to prepare a VMT analysis, both under the 2017 Original Project Design and the 2021 Revised Project Design because the Project is neither a "development" nor "transportation" project – meaning the Project does not add habitable structures or population.

An excerpt from the County's Guidelines is as follows:

> *Public Works generally will require the preparation and submission of a Transportation Impact Analysis for projects that meet the following criteria:*
>
> - *Development Projects:*
> - *Estimated to generate a net increase of 110 or more daily vehicle1 trips.*
>
> - *Transportation Projects:*
> - *Likely to induce additional vehicle1 miles traveled (VMT) by increasing vehicle capacity.*
>
> - *Projects for which a Transportation Impact Analysis is required by County ordinance; regulation; resolution; court order; or directive from the Board of Supervisors, Regional Planning Commission.*
>
> *A Transportation Impact Analysis requires analyses and forecasting of impacts or deficiencies to the circulation system generated by the project. The Transportation Impact Analysis identifies feasible measures or corrective conditions to offset any impacts or deficiencies.*

Therefore, no further analysis is required.

4.11.2 Mitigation Measures

There were no mitigation measures identified in the 2017 MND, and the 2021 Revised Project Design does not require the addition of any new measures to reduce impacts to less than significant.

4.11.3 Conclusion

The 2021 Revised Project Design does not change the type or extent of development analyzed in the 2017 MND. Implementation of the 2021 Revised Project Design does not propose substantial transportation changes beyond those analyzed in the 2017 MND or require major revisions to the 2017 MND. Therefore, the 2021 Revised Project Design would not involve new significant transportation impacts or more severe transportation impacts than those previously identified and analyzed in the 2017 MND. No additional analysis or mitigation measures are required.

4.12 TRIBAL CULTURAL RESOURCES

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
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 section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:					
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	Less Than Significant With Mitigation Incorporated	No	No	No	TCR-1
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 Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	Less Than Significant With Mitigation Incorporated	No	No	No	TCR-1

4.12.1 Discussion

Summary of 2017 MND

The 2017 MND identified that records search and field surveys did not find the existence of tribal cultural resources. Unknown buried cultural resources may possibly be affected by the Project, however, the incorporation of management and monitoring protocols will reduce this to less than significant.

2021 Revised Project Analysis

The Project occurs in the same location as analyzed by the 2017 MND. No new analysis is required.

4.12.2 Mitigation Measures

The 2017 MND identified the following mitigation measure to reduce impacts to less than significant:

TCR-1: Inadvertent Finds –

1. If human remains or funerary objects are encountered during any activities associated with the project, work in the immediate vicinity (within a 100-foot buffer of the find) shall cease and the County Coroner shall be contacted pursuant to State Health and Safety Code §7050.5 and that code enforced for the duration of the project.

2. In the event that Native American cultural resources are discovered during project activities, all work in the immediate vicinity of the find (within a 60-foot buffer) shall cease and a qualified archaeologist meeting Secretary of Interior (SOI) standards shall be hired to assess the find. Work on the other portions of the project outside of the buffered area may continue during this assessment period. Additionally, San Manuel Band of Mission Indians will be contacted if any such find occurs and be provided information and permitted/invited to perform a site visit when the archaeologist makes his/her assessment, so as to provide Tribal input.

3. If significant Native American historical resources, as defined by CEQA (as amended, 2015), are discovered and avoidance cannot be ensured, an SOI-qualified archaeologist shall be retained to develop a cultural resources Treatment Plan, as well as a Discovery and Monitoring Plan, the drafts of which shall be provided to San Manuel Band of Mission Indians for review and comment.

    a. All in-field investigations, assessments, and/or data recovery enacted pursuant to the finalized Treatment Plan shall be monitored by a San Manuel Band of Mission Indians Tribal Participant(s).

    b. The Lead Agency and/or applicant shall, in good faith, consult with San Manuel Band of Mission Indians on the disposition and treatment of any artifacts or other cultural materials encountered during the project.

Revisions to Mitigation Measures:

The 2021 Revised Project Design does not require a modification of the existing measures or the addition of any new measures to reduce impacts to less than significant.

4.12.3 Conclusion

The 2021 Revised Project Design does not change the type or extent of development analyzed in the 2017 MND. Applicable mitigation measures previously identified in the 2017 MND will be required as set forth in the MMRP, and no considerably different mitigation measures that may substantially reduce impacts have been identified or rejected. The 2021 Revised Project Design does not propose substantial changes to tribal cultural resources beyond those analyzed in the 2017 MND or require major revisions to the 2017 MND. Therefore, the 2021 Revised Project Design would not involve new significant or more severe tribal cultural resource impacts than those previously identified and analyzed in the 2017 MND. No additional analysis or mitigation measures are required.

4.13 UTILITIES AND SERVICE SYSTEMS

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
XIX. UTILITIES AND SERVICE SYSTEMS: Would the project:					
~~a)Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?~~	No Impact	(N/A – Removed from Guidelines)	(N/A – Removed from Guidelines)	(N/A – Removed from Guidelines)	(N/A – Removed from Guidelines)
a) Require or result in the relocation or construction of new or expanded water, or wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities ~~or expansion of existing facilities~~, the construction or relocation of which could cause significant environmental effects?	Less Than Significant With Mitigation Incorporated	No	No	No	UTIL-1
~~b) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?~~	No Impact	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years ~~from existing entitlements and resources, or are new or expanded entitlements needed~~?	Less Than Significant	No	No	No	None
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?	Less Than Significant	No	No	No	None
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? ~~Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs~~?	Less Than Significant	No	No	No	None

e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	Less Than Significant	No	No	No	None

4.13.1 Discussion

Summary of 2017 MND

The proposed Project site is currently undeveloped and is not served by public water, wastewater, stormwater, and solid waste collection facilities, and the nature of the Project to store water does not require those services.

Domestic water is provided to the surrounding residences by private groundwater wells. Irrigation water for farming is provided by irrigation groundwater wells and or surface water from the California Aqueduct. Wastewater disposal is managed through the use of septic systems. The nearest landfill (Kern County Landfill) is located about 20 miles west of the project. There are no oil and gas facilities known to occur in the proposed Project area. Powerlines run through the southern boundary of the proposed Project area on the north side of the California Aqueduct Right of Way.

The proposed Project consisting of storing surface water during wet weather year periods and recovering the stored water during dry weather year periods will not require an expansion of the capacity of the California Aqueduct and its pumping facilities which is the source for recharge operations and the point of delivery for recovery operations. Recharge and recovery operations will stay within the capacity of the California Aqueduct and the Agency and its partners capacity allocations.

The proposed Project would utilize electric water pumps that are anticipated to be served off the existing grid system running along the southern boundary of the proposed Project. This new electric demand may require the expansion of the existing power grid to meet the new power demands of the proposed project. Additionally, new electric lines would be required to connect the various well pumps and pump station to the existing grid. A mitigation measure was identified to minimize any impacts associated with electrical line/grid expansion that may be required to connect the various wells and pump station to the existing electrical grid.

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The Revised Project Design also does not require water, wastewater or solid waste services beyond minimal, occasional services during construction and operations. As with the original design, the revised design also requires that electricity be brought to the site to service the wells.

4.13.2 Mitigation Measures

The 2017 MND identified the following mitigation measure to reduce impacts to less than significant:

UTIL-1: **Electrical Service Upgrade Minimization Measures –** In the event that the existing electrical grid system needs to be expanded to meet the proposed project demands, the Agency will require that the Electric Company comply with all mitigation measures identified in this Initial Study during the construction of the expansion.

Revisions to Mitigation Measures:

The 2021 Revised Project Design does not require a modification of the existing measures or the addition of any new measures to reduce impacts to less than significant.

4.13.3 Conclusion

The 2021 Revised Project Design does not change the type or extent of development analyzed in the 2017 MND. Applicable mitigation measures previously identified in the 2017 MND will be required as set forth in the MMRP, and no considerably different mitigation measures that may substantially reduce impacts have been identified or rejected. The 2021 Revised Project Design does not propose substantial changes to utilities and service systems beyond those analyzed in the 2017 MND or require major revisions to the 2017 MND. Therefore, the 2021 Revised Project Design would not involve new significant or more severe utilities and service systems impacts than those previously identified and analyzed in the 2017 MND. No additional analysis or mitigation measures are required.

4.14 WILDFIRE

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
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?	Not Analyzed No Impact	No	No	No	None
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of wildfire?	Not Analyzed No Impact	No	No	No	None
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?	Not Analyzed No Impact	No	No	No	None
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	Not Analyzed No Impact	No	No	No	None

4.14.1 Discussion

An analysis of the wildfire risk was not required by the CEQA Guidelines at the time the 2017 MND was prepared. Therefore, the wildfire risk was not analyzed as part of the 2017 MND. However, the wildfire risk was known at the time of the 2017 MND and is covered briefly by Guidelines Criterion IX(g) which evaluates a Project's potential hazard to expose people and structures to wildfire.

This Environmental Subject Area is applicable if the Project is "located in or near state responsibility areas or lands classified as very high fire hazard severity zones."

The CalFire Fire Hazard Severity Zone Map viewer indicates that the Project area is located in a "Moderate" fire hazard zone. The Project site and the surrounding area is flat, and the areas adjacent to the Project are either vacant or sparsely populated with rural residential.

The potential impacts of this Environmental Subject Area is the same for both designs because the Project location is the same for both designs.

4.14.2 Mitigation Measures

No mitigation measures were required for are required for the 2017 Original Project Design had wildfire resources been evaluated in the 2017 MND beyond Guidelines Criterion IX(g). The 2021 Revised Project Design also does not require the addition of any measures to reduce impacts to less than significant.

4.14.3 Conclusion

The proposed Project does not change the type or extent of development analyzed in the 2017 MND. Implementation of the 2021 Revised Project Design does not propose substantial wildfire risks beyond those analyzed in the 2017 MND or require major revisions to the 2017 MND. Therefore, the 2021 Revised Project Design would not involve new significant wildfire impacts or more severe wildfie impacts than those previously identified and analyzed in the 2017 MND. No additional analysis or mitigation measures are required.

4.15 MANDATORY FINDINGS OF SIGNIFICANCE

ENVIRONMENTAL IMPACTS	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures Identified in Environmental Subject Areas
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?	Less Than Significant With Mitigation Incorporated	No	No	No	Biological Resources, Cultural Resources, Tribal Cultural Resources
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 other current projects, and the effects of probable future projects)?	Less Than Significant With Mitigation	No	No	No	Agricultural Resources, Air Quality, Geology/Soils, Hazards and Hazardous Materials, Hydrology and Water Quality, Noise, Utilities and Services
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	Less Than Significant With Mitigation Incorporated	No	No	No	Noise

4.15.1 Discussion

Summary of 2017 MND

The 2017 MND identified that implementation of the proposed Project could potentially result in impacts to sensitive species. The Project also may potentially result in impacts to unknown cultural resources. Any degradation of the quality of the environment would be reduced to below a level of significance through implementation of the mitigation measures identified in the respective sections of this Initial Study.

Cumulative impacts are considered as two or more individual project effects that, when considered together with other projects combine to result in a significant impact within an identified region. In order for a project to contribute to cumulative impacts, it must result in some level of impact on a project specific level. For the most part the proposed Project will cause no impact to aesthetics, land use and planning, mineral resources, population and housing, public services, recreation, and transportation and traffic.

Potential regional cumulative effects were considered for the topics of agricultural and forest, air quality, biological, cultural, greenhouse gas, geology and soils, hazards and hazardous conditions, hydrology and water quality, noise, and utilities and service systems for which the project was found to result in less than significant impacts with mitigation.

With the exception of noise impacts to adjacent residences, the project would not consist of any use or activities that would negatively affect any persons in the vicinity. Mitigation measures identified in this Initial Study, would reduce noise impacts to less than significant levels.

2021 Revised Project Analysis

The potential impacts to sensitive species and unknown cultural resources of the 2021 Revised Project were similar to that of the 2018 Original Project. No further analysis is required.

The Project purpose is the same, and the Project occurs in the same location as analyzed by the 2017 MND. Therefore, there is no change to the cumulative impacts identified in the 2017 MND.

With the exception of noise impacts to adjacent residences, the 2021 Revised Project analysis identified that the Project would not consist of any use or activities that would negatively affect any persons in the vicinity. Mitigation measures identified in the 2017 MND, would reduce noise impacts to less than significant levels under the 2021 Revised Project.

4.15.2 Mitigation Measures

The 2017 MND identified mitigation measure to reduce impacts to less than significant. The 2021 Revised Project Design Analysis did not identify a significant modification of the existing measures or the addition of any new measures to reduce any impact to less than significant.

4.15.3 Conclusions

The 2017 MND identified that all resource topics associated with the Project were analyzed in accordance with State CEQA Guidelines and found to pose no impact, less than significant impact, or less than significant impact with mitigation. Consequently, the Project would not result in any environmental effects that would cause substantial adverse effects on human beings directly or indirectly; therefore, the impact would be less than significant.

This Addendum evaluated the 2021 Revised Project Design and all relative resource topics associated with the Project were analyzed in accordance with State CEQA Guidelines. The 2021 Revised Project Design

does not propose substantial changes beyond those analyzed in the 2017 MND or require major revisions to the 2017 MND. As explained in the checklists and supporting analysis above, none of the conditions listed in CEQA Guidelines Section 15162 are triggered by the 2021 Revised Project Design. Therefore, the 2021 Revised Project Design would not involve new significant impacts or more severe impacts than those previously identified and analyzed in the 2017 MND. No additional analysis or mitigation measures are required.

Appendix A
Mitigation Monitoring and Reporting Program

Antelope Valley – East Kern Water Agency

High Desert Water Bank

California Environmental Quality Act (CEQA)

Mitigated Negative Declaration

SCH No. 2017061030

Mitigation Monitoring and Reporting Program

December 2017

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1. General

The Mitigated Negative Declaration (MND) for the Antelope Valley – East Kern Water Agency (AVEK or Agency) High Desert Water Bank (the Project) specified a number of mitigation measures to be undertaken during implementation of the proposed project. During implementation, it is essential that all of these be fully complied with and that compliance be documented in a timely manner. Failure to comply with and or document compliance could result in a challenge to the project that could result in project delays.

This Mitigation Monitoring and Reporting Program (MMRP) has been prepared for the project and has been adopted concurrently with the findings of the Initial Study and Mitigated Negative Declaration. This plan is intended to track compliance of all of the mitigation measures adopted with the Mitigated Negative Declaration.

2. Responsibility for Compliance and Documentation

Implementation of the MMRP will be the responsibility of the Agency. The Agency will assign a project manager to oversee all aspects of implementation of the proposed project and ensure that the mitigation and monitoring commitments made in the MND are carried out in a timely and effective manner. In implementing the MMRP, the Agency will often rely on the expertise of outside consultants and contractors. To ensure the effectiveness of this mitigation and monitoring, the Agency will:

- Make the MMRP an element of all project-related requests for proposals and contract specifications, specifying that construction contractors will be responsible for appropriate acquisition of permits for construction and implementation of relevant mitigation and monitoring elements, as specified in this MMRP;
- Independently review contractor compliance on a regular basis and require corrective actions in a timely manner when the Agency determines that such actions are required;
- Maintain files, open to the public for inspection, documenting compliance with the MMRP;
- Designate an Agency staff member to receive and respond to all public and Agency comments, complaints, and/or questions regarding compliance with the MMRP; and
- Provide regulatory agencies with appropriate and timely documentation of compliance as specified in regulatory permits issued for the proposed project.

Additionally, the Agency will require that construction contractors designate a principal mitigation and monitoring manager (Principal) and back-up mitigation and monitoring manager (Alternate) and shall ensure that at least one of these is on-site during all phases of construction. These persons may perform other tasks, but shall have adequate time, training, and expertise to perform the required monitoring and documentation. The Principal shall be the contractor's construction field supervisor or assistant field supervisor. The Principal or Alternate shall independently verify compliance with required mitigation measures and shall indicate verification by filling out and signing the appropriate compliance checklist, thereby certifying compliance with all measures.

3. Permits and Coordination

The MND identifies a number of permits which may need to be obtained for various aspects of the Proposed Project, as well as commitments to coordinate design, pre-construction, and

construction activities with various local, regional, State, and Federal agencies. Permits and coordination commitments are:

- Encroachment Permits for any work within Public Right of Way.
- National Pollutant Discharge Elimination System Construction Activities General Permit.
- Department of Water Resources Turnout Construction and Operations Permit.
- Department of Water Resources Encroachment Permit (if needed)
- Caltrans heavy or oversized equipment Transportation Permit (if needed).

4. Incidents and Compliance Reporting

Timely reporting of compliance and of any incidents which may result in non-compliance is essential. Contracts for construction and for independent compliance contractors shall therefore specify that, if the designated construction contractor for an activity determines that any aspect of construction is not in substantive compliance with the mitigation requirements for the activity, the contractor shall immediately take action to remedy the problem. The designated Principal or Alternate shall notify the Agency within not more than 24 hours following determination that any aspect of construction activity is not in compliance with mitigation requirements, shall explain how the incident has been addressed, and shall provide any other information requested by the Agency. Following action to address the out-of-compliance incident, the designated Principal or Alternate must complete an "incident report" and submit a copy of the report to the Agency's project manager within one week of the incident.

5. Mitigation and Monitoring Program Update

The Agency recognizes that laws, regulations, and policies related to construction activities may change during construction. The Agency's project manager is responsible for periodically reviewing the status of laws, regulations, and guidelines applicable to their construction activity. The Agency will implement any new rules in effect at the time of approval.

6. Staff Awareness

Staff must be informed of mitigation and monitoring requirements prior to construction. New staff must be oriented when they come on site. The Principal/Alternate therefore needs to review compliance requirements and monitoring requirements for the job with all personnel on site to ensure that they know the requirements, know the importance of compliance, know that violations must be reported, and know that compliance is a condition of employment on this job. Similarly, a summary list of mitigation and monitoring requirements shall be posted in a conspicuous location at the job site so that they may be referred to at any time.

7. Training

If specialized expertise is necessary for mitigation or monitoring, Agency staff or the delegated construction contractor shall provide such training to the persons responsible for compliance and/or monitoring. For example, if biological pre construction surveys identify the presence of a special status species, the Agency shall retain the services of a qualified biologist familiar with this species to provide environmental training for the identification and protection of same.

8. On Going Documentation

Compliance will be monitored on a timely basis, depending on the nature of the activity and the

Mitigation requirement. Where appropriate. photo documentation of pre-construction conditions, of activities during construction, of any incidents that may constitute a violation of mitigation requirements, and of post construction conditions are encouraged. However, if photo documentation is adopted as a monitoring tool, it must be used consistently to ensure that there are records of all activities for which compliance must be documented. Labels must be explanatory and contain adequate information about the photographer, date, time, and conditions when the photo was taken. Photo documentation shall be backed up with paper copies and/or records on CD/DVD. Agency staff may audit records of compliance with mitigation and monitoring requirements at any time and compliance records must be readily available and in good order. Logs of mitigation and monitoring compliance should be maintained and supporting documentation should be provided in parallel to the log. The Agency and its project manager and other contractors will maintain such records in a form suitable for the required monitoring and reporting. It is anticipated that contractors will generally have appropriate monitoring templates for typical construction activities. In other cases, the format of compliance monitoring records may be available from the regulatory Agency approving the monitoring (if any).

9. Pre-Construction Training

Prior to initiation of construction activity, the Agency will review the mitigation commitments in this MMRP and will determine the need for pre-construction training. The Agency and its contractors will prepare appropriate training materials and provide appropriate training to construction staff to ensure that they fully understand compliance and reporting requirements. It is anticipated that pre-construction training may be necessary for the following:

- Activities that involve excavation (cultural, biological, dust, noise, traffic)
- Activities that involve use of heavy equipment (dust, noise)
- Activities in the vicinity of trees (biological)
- Activities in the vicinity of public and private utilities

10. Mitigation and Monitoring Requirements

The following includes a list of all of the mitigation measures identified in the MND.

AGRICULTURAL RESOURCES

AG-1: Prime Farmland Avoidance – The Agency will not perform recharge operations on the 60 acres of semi active farmed Prime Farmland on the northwest corner of the property.

AIR QUALITY

AQ-1: Minimization Measure for NOx Related Emissions - Construction contractor shall use off road construction diesel engines that meet, at a minimum, the Tier 4 interim California Emissions Standards, unless such an engine is not available for a particular item of equipment. Tier 3 engines will be allowed on a case by case basis when the contractor has documented that no Tier 4 interim equipment or emissions equivalent retrofit equipment is available for a particular equipment type that must be used to complete construction. Documentation shall consist of signed written statements from at least two construction equipment rental firms.

BIOLOGICAL RESOURCES

BIO-1 : Burrowing Owls – Prior to ground-disturbing activities and other habitat disturbance, clearance surveys for active burrowing owl burrows shall be conducted of all areas subject to disturbance. Prior to ground-disturbance associated with construction of the Project, including vegetation clearance and grubbing, preconstruction clearance surveys shall be conducted by a

qualified biologist within the Project site and a 500-foot buffer of the site in order to locate active burrowing owl burrows. Pre-construction clearance surveys shall be conducted no more than two (2) weeks prior to construction. Surveys will be conducted following guidelines provided in the *Staff Report on Burrowing Owl Mitigation* (CDFW 2012).

Within two (2) weeks prior to inundation, trained AVEK personnel shall review all areas subject to inundation for presence of burrows with entrances suitable for burrowing owl occupation and potential burrowing owl sign. Any identified potentially occupied burrows will be investigated further by a qualified biologist prior to inundation. Training will be conducted by a qualified biologist for AVEK personnel who conduct pre-inundation surveys prior to the commencement of the first inundation survey. Training will discuss burrowing owl identification and sign and burrow recognition, their status, and the laws governing their protection. Training will be conducted by a qualified biologist on an annual basis for all Project operations personnel as a refresher.

If no burrowing owls are detected, no further mitigation will be required. If burrowing owls are observed during any survey, the following measures will be implemented:

- Occupied burrows will not be disturbed during the nesting season (April 1 through October 15).
- Occupied burrows will not be subject to inundation during operation of the water bank.
- Avoidance shall be the preferred approach for occupied burrows whenever feasible. If occupied burrows are observed during the non-breeding season (October 16 through March 31), a 160-foot buffer will be established; no construction or other physical work activities will occur within the buffer. If occupied burrows are observed during the breeding season (April 1 through October 15), a 650-foot buffer shall be established; no construction or other physical work activities will occur within the buffer.
- When destruction of occupied burrows is unavoidable, destruction shall occur only during the non-nesting season (October 16 through March 31). Prior to destruction of occupied burrows within the Project site, any unsuitable burrows outside the disturbance footprint will be enhanced (enlarged, cleared of debris) to facilitate occupation.
- If owls must be moved away from the Project area, passive relocation techniques (e.g., installation of one-way exclusion doors at burrow entrances) will be used instead of trapping. ~~A~~ Passive relocation techniques will be employed for a minimum of one week in order to allow owls to acclimate to alternate burrows.

In order to provide protections for burrowing owls throughout construction and operations of the Project, a Burrowing Owl Protection Plan shall be developed prior to construction of the recharge basins. This plan will provide acceptable strategies for avoiding and minimizing impacts to burrowing owls and burrowing owl habitat on the Project site.

BIO-2 : Desert Kit Fox and American Badger – Clearance surveys for occupied desert kit fox and American badger dens shall be conducted prior to any Project disturbance activities, including initial construction and ongoing operations such as inundation of the recharge basins.

Within two (2) weeks prior to the start of construction, a qualified biologist shall conduct pre-construction clearance surveys of the work area and a 150-foot buffer for signs of desert kit fox and American badger, including active and inactive natal and non-natal dens, scat, prey remains, and tracks. All suitable denning locations shall be investigated for use.

Within two (2) weeks prior to inundation of the basins, trained AVEK personnel shall review all areas subject to inundation for potential sign of American badger or desert kit fox, including active and inactive natal and non-natal dens. Any identified potential sign of presence will be investigated further by a qualified biologist prior to inundation. Training will be conducted by a qualified biologist for AVEK personnel who conduct pre-inundation surveys prior to the commencement of the first inundation survey. Training will discuss American badger and desert kit fox identification and sign and den recognition, their status, and the laws governing their protection. Training will be conducted by a qualified biologist on an annual basis for all Project operations personnel as a refresher.

If dens are observed, the following measures will be implemented:

- Occupied dens will not be subject to inundation during operation of the water bank.
- Inactive dens shall be excavated by hand with a shovel to prevent badgers/kit foxes from re-using dens during construction.
- If active natal dens are observed during the survey, a buffer of 300 feet shall be established around the den; no construction or work activities will occur within the buffer. The den shall be monitored and the buffer maintained until a qualified biologist has determined that the den is no longer active, at which time it shall be excavated by hand to prevent re-use. Passive relocation of American badger and desert kit fox shall not take place while young are still in dens and dependent on the parents for food, or while females may be pregnant.
- If active, non-natal dens are observed within the Project site or buffer, badgers/kit foxes shall be discouraged from using these dens prior to clearing, grubbing, and/or grading of the site, by partially blocking the entrance of the den with sticks, debris, and soil for 3 to 5 days. Access to the den shall be incrementally blocked to a greater degree over this period, encouraging the badger/kit fox to vacate the den of its own volition. After badgers/kit foxes have stopped using active dens within the Project boundary, the dens shall be hand-excavated with a shovel to prevent re-use.
- If newly active badger/kit fox dens are found during construction activities, all work in the area shall cease until the biologist can safely close the den.
- If a desert kit fox or American badger is encountered during Project activities, all work that could result in a direct injury, disturbance, or harassment shall immediately stop and the Project biologist shall be notified.
- Where desert kit foxes have the potential to occur, all heavy equipment and vehicles left on-site overnight will be inspected at the beginning of each work day to verify that no individuals have taken shelter under the equipment. If a desert kit fox is observed, the project biologist shall be notified and the animal shall be observed from a distance until it has moved out of the area of its own accord.

BIO-3 : Nesting Birds - If construction activities occur within the breeding bird season (February 1 through September 15), all vegetation clearing and initial ground disturbing activities will be preceded by a nesting bird survey. Nesting bird surveys will be conducted by a qualified biologist of all areas that may support nesting and will be subject to disturbance, as well as a 300-foot buffer for passerine species and 500-foot buffer for raptors. Surveys will be conducted no more than 7 days prior to construction activities.

- If an active nest is observed, a no-disturbance buffer will be established until a qualified biologist has determined the nest has either failed or has successfully fledged and the young are no longer dependent on the nest. The no-disturbance buffer will measure no less than 500 feet for raptors, and 300 feet for all other species.

BIO-4 : Animal Movement and Entrapment (Trenches) - All trenches that are to be left open overnight shall be either securely covered or have wildlife escape ramps installed during non-work hours to prevent entrapment of common and special-status wildlife species. All steep-walled pipeline and utility trenches shall be inspected in the mornings and prior to backfilling to prevent mortality of common and special-status wildlife species. All entrapped wildlife shall be removed or allowed to escape voluntarily via escape ramps prior to construction resuming.

BIO-5 : Animal Movement and Entrapment (Pipes) – All pipes, culverts, or similar structures on-site with a diameter of 2 to 24 inches shall be inspected for special-status species prior to moving or welding. Openings shall be capped or otherwise covered if sections cannot be inspected to prevent the entry and potential loss of wildlife. If a common or special-status species is discovered inside a pipe, the animal shall be safely removed by a qualified biologist. The pipe segment shall not be moved until the animal has escaped, or the pipe segment shall be moved a single time out of the path of construction. Alternatively, stored pipe may be kept capped at all times until used during construction. Vertical, open-ended pipes used as fence posts, property line demarcations, sign posts, etc., will be capped or otherwise plugged to prevent the entrapment and possible injury and mortality of wildlife.

BIO-6 : Erosion and Sediment Control - Best available erosion and sediment control measures will be employed to prevent downstream dispersal of sediments during and following Project-related activities. These measures may include sediment basins, gravel bags, silt fences, geo-bags, or gravel and geotextile fabric berms, erosion control blankets, coir rolls, jute net, and straw bales. The use of erosion control materials potentially harmful to wildlife species, including monofilament netting (erosion control matting) or similar material, will not be employed.

BIO-7 : Special-Status Plants - Prior to construction of the recharge basins, floristic surveys shall be conducted of all potentially suitable habitats on the Project site. Floristic surveys shall be conducted by a qualified biologist following CDFW's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFW 2009). If no special-status plants are observed, no further mitigation will be necessary. If special-status plants are observed during surveys, the following measures will be implemented:

- Individuals will be protected in place to the extent feasible through implementation of avoidance and buffers.
- If special-status plant individuals or populations must be impacted, individuals will be salvaged and/or transplanted to suitable habitat within the established on-site habitat management lands. If salvage is not feasible, mitigation at a 2:1 ratio will be provided within habitat management lands. In the case of annual species, top soil salvage may be employed to preserve the existing seed bank where appropriate enhancement of existing populations may be employed at the same 2:1 ratio.

BIO-8 : Swainson's Hawk - Prior to construction of the recharge basins, focused Swainson's hawk surveys shall be conducted. Surveys for Swainson's hawk shall be conducted by a qualified biologist following the methods outlined in Swainson's Hawk Survey Protocols, Impact Avoidance, and Minimization Measures for Renewable Energy Projects in the Antelope Valley of Los Angeles and Kern Counties, California (CDFW 2010). Surveys shall include all potential Swainson's hawk nesting habitat within a 5 mile radius of the Project site. Surveys shall include all potential nest trees, towers or other potential nest sites (including nests used within the last 5 years) outside the nesting season for Swainson's hawk.

If no active Swainson's nests are observed, no further mitigation will be necessary. If an active Swainson's hawk nest is detected during focused surveys, the following measures will be

implemented:

- No removal of active Swainson's hawk nests will be conducted during Project construction and/or operations.
- No construction activities will be conducted within a 0.5-mile radius of an active Swainson's hawk nest. Prior to construction activities, a qualified biologist will conduct a focused Swainson's hawk nest survey within an up to 0.75-mile radius of proposed construction activities to identify any active nests.
- If active Swainson's hawks nests are identified within a 0.5-mile radius of the Project site, a Habitat Management Plan will include specific, detailed measures to avoid and minimize impacts to Swainson's hawks in or near the Project site during both construction and operation of the Project.

BIO-9 : Tri-colored Blackbirds - While the Initial Study indicates that impacts to tricolored blackbird foraging habitat due to Project-related activities are less than significant, at the request of the CDFW focused nesting season surveys will be conducted as follows: Prior to construction of the recharge basins, focused nesting tri-colored blackbird surveys shall be conducted of all potentially suitable nesting habitats and documented nesting colonies within the Project site and within a 3-mile radius of the Project site for any active nesting colonies.

BIO-10 : Jurisdictional Drainages and Wetlands - Prior to construction of the recharge basins or any ground-disturbing activities within waterways and wetlands on the site, a formal Jurisdictional Delineation will be conducted of all potential jurisdictional waters within the Project site. Fill or disturbance of any jurisdictional waters or wetlands will be permitted through the appropriate agency (i.e., Sections 401 and 404 of Clean Waters Act, or Section 1600 of California Fish and Game Code). Impacts to jurisdictional waters and wetlands will be avoided to the extent feasible, and shall not occur prior to issuance of any required local, state, and federal permits.

BIO-11 : Habitat Mitigation - AVEK will designate a significant allotment of land as habitat management lands. The purpose of these areas is to provide foraging habitat for Swainson's hawk, tricolored blackbird, nesting and foraging habitat for burrowing owl, and denning and foraging habitat for desert kit fox and American badger. The details of the management of these lands shall be described in a *Habitat Management Plan* to be prepared prior to construction of the recharge basins.

BIO-12 : General Biological Measures –

Worker Environmental Awareness Training - Prior to construction, a Worker Environmental Awareness Training shall be prepared and presented by a qualified biologist to all construction personnel at the start of Project-related activities. The training shall discuss sensitive-status species with the potential to occur within the Project footprint, including their regulatory status, description, and habitat requirements, and any sensitive habitat areas that may be encountered. The program shall emphasize the importance of minimizing disturbance, and describe the federal, state, and local regulations protecting biological resources and the potential penalties for non-compliance with these laws and statutes.

Equipment Staging - All construction equipment, staging areas, materials and personnel shall be restricted to existing roadways and road shoulders, designated work areas, or previously disturbed off-site areas that are not habitat for special-status species.

Site Cleanliness - All trash and food items shall be contained and removed from the site regularly to prevent attracting predators and scavengers, such as dogs, coyotes, desert kit fox, or common ravens, to the Project area.

Hazardous Waste Cleanup - Any spills of petroleum products or other chemicals, which may represent a hazard to wildlife, shall be cleaned up promptly and in accordance with appropriate laws and regulations.

CULTURAL RESOURCES

CR-1: Cultural Resources Monitoring – The Project site has been identified to have a low to moderate potential of finding significant archaeological resources lacking surface manifestations that may be encountered during Project construction. To lessen the impact of unknown archeological resources, the Agency will develop a Cultural Resources Monitoring and Mitigation Plan prior to start of ground disturbance. This plan will implement part time monitoring by a qualified archeologist and or a Native American Monitor. In the event that project construction activities result in a finding of significant importance, the qualified archeologist may increase the level of monitoring. If no findings occur during the part time monitoring, the archeologist may further reduce or eliminate the monitoring. During a find of a potentially significant archaeological resource, the resource will be inventoried and evaluated to ascertain whether the resource meets the criteria for listing on the California Register of Historical Resources. After the discovery, all work being conducted within the vicinity of the discovery will be halted or diverted away from the site of discovery until a qualified archaeologist can assess the potential significance of the find.

CR-2: Regulation Compliance – The Agency will comply with Health and Safety Code Section 7050.5, CEQA Section 15064.S(e), and Public Resources Code Section 5097.98, which mandate the process to be followed in the unlikely event of an accidental discovery of any human remains in a location other than a dedicated cemetery.

GEOLOGY AND SOILS

GEO-1: SWPPP - To control water and wind erosion during construction and operation of the Project, the Agency will prepare a Stormwater Pollution Prevention Plan (SWPPP) in compliance with the requirements of the National Pollutant Discharge Elimination System (NPDES) Construction General Permit.

GEO-2: Seismic Design - Although the proposed Project has little inherent potential for causing seismic safety effects, the Agency will ensure that all facilities are designed to withstand the anticipated seismic forces, consistent with local and State building codes and relevant regulations.

GEO-3: Pipeline Shut Off Valves - The Agency will install shut off valves on major pipelines to minimize the potential for flooding during seismic events.

GEO-4: Groundwater Monitoring Plan - Although the potential for the Project to raise groundwater levels to within 30 to 50 feet of the ground surface is small, to address potential impacts to local groundwater levels, the Agency will develop a monitoring program to monitor changes in water levels in the area affected by groundwater recharge operations. If monitoring identifies groundwater level rise to 75 feet below ground surface, the Agency will modify management of recharge to prevent water levels from rising to levels where liquefaction effects could occur. The Groundwater Monitoring Plan will also include provisions for monitoring of groundwater quality and the development of a native groundwater quality baseline which would be identified prior to commencement of recharge operations.

HAZARDS AND HAZARDOUS MATERIALS

HAZ-1: Spill Prevention Plan - Consistent with Agency's existing practices, the Agency will require from its construction contractors the preparation and implementation of a Spill Prevention Control and Countermeasures Plan (SPCCP) to minimize the potential for, and effects from, spills of hazardous, toxic, or petroleum substances during construction activities and operations. The plan and methods shall be in conformance with all State and Federal regulations. The Agency shall provide for routine inspection of the construction and operations areas to verify that the measures specified in the SPCCP are properly implemented and maintained and further ensure that contractors are notified immediately if there is a noncompliance issue and will require compliance.

HAZ-2 : Bird Strike Hazard Notification - The Agency will notify the Flight Safety Office at Edwards Air Force Base and all local airports of the potential bird strike hazard as follows:

- Prior to application of water to the recharge basins, and
- If large birds or large concentrations of small birds are observed in or near the recharge area.

HAZ-3: Bird Strike Hazard Minimization Measures - The Agency will implement actions to reduce the attractiveness of the recharge basins to birds by:

- Use of recharge basins with shallow water depths which will be generally unsuitable for the larger migratory birds,
- Monitor recharge area water and if aquatic macroinvertebrates are found to be developing in large numbers and/or foraging by shorebirds is observed, temporarily dry out recharge areas, thereby reducing the insect and aquatic macroinvertebrate forage that would attract and hold shorebirds.
- Whenever water is present in the recharge basins, the project operator will monitor the basins daily for bird activity and if found discourage their use via means acceptable to the Department of Fish and Wildlife.

HAZ-4: Mosquito Borne Disease Minimization Measures – The Agency will consult with the Antelope Valley Mosquito and Vector Control District to develop and implement a mosquito management plan. The plan would consist of a Project specific mosquito abatement program that would include quantitative abatement thresholds. The Agency and/or its representative would monitor mosquito larvae production in the recharge basins, drainages, and distribution. Larvae populations would be tracked using methods and thresholds approved by the Mosquito Abatement District, and suppression measures would be employed when thresholds are exceeded. The primacy mode of suppression would be to monitor for mosquito presence and if mosquito larvae are found, to cycle recharge temporarily so that units of recharge would be dried.

HYDROLOGY AND WATER QUALITY

HWQ-1: Drainage Design - Recharge areas will be constructed so that they will not divert sheet flooding and other runoff away from the recharge areas. This will allow flood water to flow into the recharge areas where flows will be somewhat retarded by the recharge berms. Berms will be designed with berm heights below the calculated flood depth elevations and intended to be sacrificial. Flood flows would enter the site, go through the berms, overtop or destroy the

berms in sequence, and eventually exit the project site along the eastern boundary of the proposed project in a manner similar to pre-project conditions.

HWQ-2: **Stormwater Pollution Prevention Plan (SWPPP)** - To reduce or eliminate Construction related water quality effects, before onset of any construction activities, the Agency or its contractor will prepare a Storm Water Pollution Prevention Plan. The SWPPP will include temporary erosion control measures (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover). These measures will be employed to control erosion from disturbed areas. Measures for the control of pollutants during construction include:

- Use of existing access points to minimize dust and tracking materials onto Public Streets,
- Designated Parking, Storage, and Service Areas protected by silt fence and oil absorbents and sloped to control drainage,
- Minimize diesel storage,
- Stockpile spill cleanup materials,
- Regular vehicle inspection for leaks.
- Fuel off-channel with a secondary containment system for spills,
- Use quick connects whenever possible,
- Fueling by authorized personnel only, and
- Spill cleanup materials readily available.

The SWPPP shall include a Fugitive Dust Control Plan (FDCP) that will include extensive measures to control and manage soil erosion. The FDCP will provide for management of open soils that will contribute to management of runoff.

Consistent with the SWPPP and the Agency's current construction management practices, the Agency or its agent will perform routine inspections of the construction area to verify that the BMPs specified in the SWPPP are properly implemented and maintained. The Agency will notify its contractors immediately if there is a noncompliance issue and will require compliance.

HWQ-3: Spill Prevention Plan - Consistent with Agency's existing practices, the Agency will require from its construction contractors the preparation and implementation of a Spill Prevention Control and Countermeasures Plan (SPCCP) to minimize the potential for, and effects from, spills of hazardous, toxic, or petroleum substances during construction activities and operations. The plan and methods shall be in conformance with all State and Federal regulations. The Agency shall provide for routine inspection of the construction and operations areas to verify that the measures specified in the SPCCP are properly implemented and maintained and further ensure that contractors are notified immediately if there is a noncompliance issue and will require compliance.

HWQ-4: Protection of Off Site Wells. To address potential impacts to groundwater and adjacent well owners, the Agency will develop a monitoring program to monitor changes in water levels and well production in the area affected by groundwater recharge operations. The program will specify that:

- Extractions of groundwater shall not exceed 90% of the amount of water recharged,
- Water quality in recovered water and in groundwater flowing away from the Project will be monitored to ensure that water quality remains appropriate for designated beneficial uses,

- During recharge operations, water levels will be monitored and recharge operations will be suspended in the event that offsite water levels rise to within 75 feet of the ground surface, and
- During recovery operations, water levels in offsite wells will be monitored and operations will be adjusted if offsite wells are found to be adversely affected by project operations,

HWQ-5: Management of Herbicides and Pesticides - The Agency will comply with all regulations of the California Department of Pesticide Regulation regarding the use of herbicides and pesticides in areas designated for groundwater recharge.

NOISE

NOISE-1: Construction Noise Monitoring and Minimization Measures – The Agency and its construction contractors will monitor noise levels for construction activities near and along 280th Street West corresponding to the eastern boundary of the proposed Project area which includes potential noise receptors (residential homes). In the event that noise levels exceed the County of Los Angeles designated thresholds, the construction contractor will implement noise reduction measures to include:

- Providing construction equipment with sound control devices.
- With the exception of well drilling operations, restrict construction activities to day time hours.
- In the event that construction activities occur close to sensitive noise receptors, implementing appropriate additional noise mitigation measures, including but not limited to:
    - Changing the location of stationary construction equipment,
    - Shutting off idling equipment,
    - Rescheduling construction activity
    - Notifying adjacent residents in advance of construction work, and
    - Installing acoustic barriers around stationary construction noise sources.

NOISE-2: Operation Noise Minimization Measures – The Agency proposes to construct approximately 7 groundwater wells in the vicinity of 280th St. West which have the potential to increase the ambient noise level for the nearby residential homes on the east side of 280th St. West during groundwater recovery operations. The Agency proposes to equip these wells with insulated well enclosures that will reduce the operational noise level in the area to less than significant.

TRIBAL CULTURAL RESOURCES

TCR-1: Inadvertent Finds –

1. If human remains or funerary objects are encountered during any activities associated with the project, work in the immediate vicinity (within a 100-foot buffer of the find) shall cease and the County Coroner shall be contacted pursuant to State Health and Safety Code §7050.5 and that code enforced for the duration of the project.

2. In the event that Native American cultural resources are discovered during project activities, all work in the immediate vicinity of the find (within a 60-foot buffer) shall cease and a qualified archaeologist meeting Secretary of Interior (SOI) standards shall be hired to

assess the find. Work on the other portions of the project outside of the buffered area may continue during this assessment period. Additionally, San Manuel Band of Mission Indians will be contacted if any such find occurs and be provided information and permitted/invited to perform a site visit when the archaeologist makes his/her assessment, so as to provide Tribal input.

3. If significant Native American historical resources, as defined by CEQA (as amended, 2015), are discovered and avoidance cannot be ensured, an SOI-qualified archaeologist shall be retained to develop an cultural resources Treatment Plan, as well as a Discovery and Monitoring Plan, the drafts of which shall be provided to San Manuel Band of Mission Indians for review and comment.

    a. All in-field investigations, assessments, and/or data recovery enacted pursuant to the finalized Treatment Plan shall be monitored by a San Manuel Band of Mission Indians Tribal Participant(s).
    b. The Lead Agency and/or applicant shall, in good faith, consult with San Manuel Band of Mission Indians on the disposition and treatment of any artifacts or other cultural materials encountered during the project.

UTILITIES AND SERVICE SYSTEMS

UTIL-1: Electrical Service Upgrade Minimization Measures – In the event that the existing electrical grid system needs to be expanded to meet the proposed project demands, the Agency will require that the Electric Company comply with all mitigation measures identified in this Initial Study during the construction of the expansion.

Appendix B
Air Quality/Greenhouse Gas Analysis

MD ACOUSTICS
Sound Solutions for Planning and Design

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September 20, 2021

Ms. Julie Gilbert
Compass Consulting Enterprises, Inc.
PO Box 2627
Avalon, CA 90704

Subject: Antelope Valley – East Kern Water Agency – High Desert Water Bank – Focused Air Quality and Greenhouse Gas Impact Evaluation for Revised Project Design

Dear Ms. Gilbert:

MD Acoustics, LLC (MD) has completed a focused Air Quality and Greenhouse Gas Evaluation for the proposed High Desert Water Bank project in Antelope Valley, California. The purpose of this focused study is to evaluate the air quality and greenhouse gas construction emissions generated by the project, according to the proposed revised project design, and to compare the project emissions to Antelope Valley Air Quality Management District's (AVAQMD) thresholds of significance as it relates to residential and commercial uses. A list of definitions and terminology is located in Appendix A.

1.0 Project Description

The Project Site is approximately 1,500 acres and is currently consists of undeveloped and fallowed agricultural land bounded by Avenue A (Kern / Los Angeles County Line) on the north, 300th Street West on the west, 280th Street West on the East, and the California Aqueduct on the south. The Project will be a groundwater recharge and recovery program that includes the construction of a new turnout off of the California Aqueduct, a new approximately 11.5 mile transmission underground pipeline, new recharge facilities consisting of 42 engineered fill berms and concrete spillways over 890 acres of the site, 28 new groundwater extraction wells, 5 new monitoring wells, and a new booster pump station.

The site is surrounded by the Tehachapi and San Gabriel mountain ranges to the north, south, and west. With the exception of some isolated residential homes within and to the east of the Project area, the nearest residential communities are located ½ mile south and east of the Project area.

2.0 AQ/GHG Thresholds of Significance

2.1 AQ Significance Thresholds

Project emissions were compared to regional AVAQMD's thresholds of significance for construction emissions[1].

2.2 GHG Significance Thresholds

The project emissions were compared to the AVAQMD's 100,000 tons CO_2e per year and 548,000 pounds CO_2e per day threshold for all land uses[1].

[1] https://avaqmd.ca.gov/files/e5b34d385/AV%20CEQA%20Guides%202016.pdf

3.0 Evaluation Procedure/Methodology

MD utilized the latest version of CalEEMod (2020.4.0) to calculate both the construction emissions from the project site[2]. Project construction is anticipated to commence no earlier than the fourth quarter of 2021 and take approximately 21 months to complete. Therefore, for modeling purposes, construction was assumed to be begin December 2021 and be completed by April 2024. Construction assumes grading, building construction, paving, and architectural coating. CalEEmod defaults were utilized. Assumptions and output calculations for winter, summer and annual are provided in Appendix C.

AECOM had previously performed air quality analyses for this project prior to an update to the project design. MD used the calculations done by AECOM as a basis to show the estimated impact the update would have on emissions. MD performed calculations for only the activities that were being updated, that is Activity 3: Transmission Facility / Underground Pipeline; Activity 4: Recharge Facility / Recharge Basin, Grading, Above-ground Pipeline Install; and Activity 5: Recovery Facilities / Extraction Wells / Recovery. The updates upon which the calculations were based are detailed in Table 1.

Table 1: Construction Assumption Comparison

2017 Original Project Design	2021 Revised Project Design
Activity 3: Transmission Facility / Underground Pipeline	
1 crane (190 hp, 2 hours per day)	2 cranes (190 hp, 2 hours per day)
1 hydraulic excavator (180 hp, 6 hours per day)	2 hydraulic excavators (180 hp, 6 hours per day)
1 grader (174 hp, 6 hours per day)	2 graders (174 hp, 6 hours per day)
1 off-highway truck (479 hp, 4 hours per day)	1 off-highway truck (479 hp, 4 hours per day)
2 water trucks (200 hp, 4 hours per day)	2 water trucks (200 hp, 4 hours per day)
1 belly scraper (313 hp, 4 hours per day)	3 belly scrapers (313 hp, 4 hours per day)
2 wheeled loaders (165 hp, 8 hours per day)	2 wheeled loaders (165 hp, 8 hours per day)
1 skip loader (88 hp, 3 hours per day)	1 skip loader (88 hp, 3 hours per day)
2 backhoes (108 hp, 5 hours per day)	4 backhoes (108 hp, 5 hours per day)
Approx Total Acres disturbance: 9.5 miles x 20 ft wide = **23 AC** Estimated Construct Time: 10 months	Approx Total Acres disturbance: 11.5 miles x 20 ft wide = **27 AC** Estimated Construct Time: 12
Activity 4: Recharge Facility / Recharge Basin, Grading, Above-ground Pipeline Install	
2 backhoes (108 hp, 5 hours per day)	2 backhoes (108 hp, 5 hours per day)
	2 graders (174 hp, 6 hours per day)
	2 off-highway truck (479 hp, 4 hours per day)
	2 water trucks (200 hp, 4 hours per day)
	6 belly scrapers (313 hp, 6 hours per day)
	2 wheeled loaders (165 hp, 6 hours per day)
	2 skip loaders (88 hp, 3 hours per day)
Approx Total Acres disturbance: **1,200 AC** Estimated Construct Time: 10 months Initial 6 months continuously to re-establish as needed	Approx Total Acres disturbance: **890 AC** Estimated Construct Time: 12 months Initial

[2] https://www.caleemod.com/

2017 Original Project Design	2021 Revised Project Design
Activity 5: Recovery Facilities / Extraction Wells / Recovery	
1 drilling rig (500 HP, 24 hrs per day for 90 days)	2 drilling rigs (500 HP, 24 hrs per day for 90 days)
1 hydraulic excavator (180 hp, 6 hours per day)	2 hydraulic excavators (180 hp, 6 hours per day)
1 grader (174 hp, 6 hours per day)	2 off-highway trucks (479 hp, 4 hours per day)
1 off-highway truck (479 hp, 4 hours per day)	2 wheeled loaders (313 hp; 1 hour per day)
1 small roller compactor (114 hp, 1 hour per day)	1 water truck (200 hp, 1 hour per day)
1 skip loader (88 hp, 1 hour per day)	2 Test pumps (200 hp, 60 hrs per well)
1 wheeled loader (313 hp; 1 hour per day)	2 skip loaders (88 hp, 1 hour per day)
1 water truck (200 hp, 1 hour per day)	2 small roller compactors (114 hp, 1 hour per day)
Test pump (200 hp, 60 hrs per well)	2 graders (174 hp, 6 hours per day)
Approx Total Acres disturbance: 100 x 100 pad x 18 pads = **4.13 AC**	Approx Total Acres disturbance: 100 x 100 pad x 28 pads = **6.5 AC**
Estimated Construct Time: 12 months	Estimated Construct Time: 30 months

4.0 Findings

The following outlines the emissions for the project:

4.1 Regional Construction Emissions

The construction emissions for the project would not exceed the AVAQMD's daily emission thresholds at the regional level as indicated in Table 2, and therefore the impact would not be considered significant. The emissions were calculated using Mitigation Measure AQ-1, which requires the use of off-road construction diesel engines that meet Tier 4 interim California Emission Standards. Unmitigated emissions would exceed the NO_x threshold of 137 pounds per day by approximately 50 pounds per day, while mitigates emissions would be below the same threshold by approximately 0.85 pounds per day. CalEEMod outputs for these calculations can be found in Appendices B – D.

<Table 2, next page>

Table 2: Regional Significance – Construction Emissions (lbs/day)

Activity	Pollutant Emissions (pounds/day)				
	VOC	NOx	CO	PM10	PM2.5
Activity 3: Transmission Facility / Underground Pipeline					
2017 Original Project Design[2]	1.36	21.76	39.21	10.05	2.98
2021 Revised Project Design - Unmitigated	4.47	38.71	44.65	4.19	2.21
2021 Revised Project Design - Mitigated	1.84	26.26	56.09	2.65	0.08
Mitigated Emission Change	0.48	4.50	16.88	-7.40	-2.90
Activity 4: Recharge Facility / Recharge Basin, Grading, Above-ground Pipeline Install					
2017 Original Project Design[2]	0.61	4.43	12.02	3.01	1.73
2021 Revised Project Design - Unmitigated	6.89	66.94	59.23	6.38	3.31
2021 Revised Project Design - Mitigated	2.29	32.24	70.63	3.73	0.89
Mitigated Emission Change	1.68	27.81	58.61	0.72	-0.84
Activity 5: Recovery Facilities / Extraction Wells / Recovery					
2017 Original Project Design[2]	2.79	45.12	77.05	38.47	5.67
2021 Revised Project Design - Unmitigated	9.71	88.81	74.32	6.45	3.78
2021 Revised Project Design - Mitigated	5.10	73.69	150.70	3.92	1.42
Mitigated Emission Change	2.31	28.57	73.65	-34.55	-4.25
Subtotal of Activities 1,2,5 (overlap Year 1, months 1-3)					
2017 Original Project Design[2]	5.79	88.06	146.07	57.3	10.56
2021 Revised Project Design - Unmitigated	12.71	131.75	143.34	25.28	8.67
2021 Revised Project Design - Mitigated	8.10	116.63	219.72	22.75	6.31
Subtotal of Activities 3,5 (overlap Year 1, months 11,12)					
2017 Original Project Design[2]	4.15	66.88	116.26	48.52	8.65
2021 Revised Project Design - Unmitigated	14.18	127.52	118.97	10.64	5.99
2021 Revised Project Design - Mitigated	6.94	99.95	206.79	6.58	1.50
Subtotal of Activities 3,5,6 (overlap Year 2, months 1-5)					
2017 Original Project Design[2]	30.99	97.09	153.59	70.08	13.11
2021 Revised Project Design - Unmitigated	41.02	157.73	156.30	32.20	10.45
2021 Revised Project Design - Mitigated	33.78	130.16	244.12	28.14	5.96
Subtotal of Activities 4.5,6 (overlap Year 2, month 6)					
2017 Original Project Design[2]	30.24	79.76	126.4	63.05	11.86
2021 Revised Project Design - Unmitigated	43.44	185.96	170.89	34.39	11.54
2021 Revised Project Design - Mitigated	34.23	136.14	258.65	29.23	6.77
2017 Maximum Daily Construction Emissions[2]	30.99	97.09	153.59	70.08	13.11
2021 Unmitigated Maximum Daily Construction Emissions	43.44	185.96	170.89	34.39	11.54
2021 Mitigated Maximum Daily Construction Emissions	**34.23**	**136.14**	**258.65**	**29.23**	**6.77**
Change in Maximum Daily Construction Emissions - Unmitigated	12.45	88.87	17.30	-35.69	-1.57
Change in Maximum Daily Construction Emissions - Mitigated	3.24	39.05	105.06	-40.85	-6.34
AVAQMD Thresholds	**137**	**137**	**548**	**82**	**65**
Exceeds Thresholds	No	**No**	No	No	No

Notes:
[1] Source: CalEEMod Version 2020.4.0
[2] Source: 2017 AECOM – Air Quality Technical Memorandum

4.2 GHG Emissions

Table 3 outlines the construction GHG emissions for the project. The project's emissions are below both AVAQMD's thresholds of 100,000 $MTCO_2e$ per year and 548,000 pounds CO_2e per day for all land uses and therefore, the impact is less than significant. The emissions were calculated using Mitigation Measure AQ-1, which requires the use of off-road construction diesel engines that meet Tier 4 interim California Emission

Standards. The mitigation had a negligible effect on GHG emissions. CalEEMod outputs for these calculations can be found in Appendices B – D.

Table 3: Construction Greenhouse Gas Emissions

Activity	GHG Emissions	
	Annual (MT CO_2e/yr)	Daily (lbs CO_2e/day)
Activity 3: Transmission Facility / Underground Pipeline		
2017 Original Project Design[2]	561.85	8,624.00
2021 Revised Project Design	869.92	10,091.53
Emission Change	308.07	1,467.53
Activity 4: Recharge Facility / Recharge Basin, Grading, Above-ground Pipeline Install		
2017 Original Project Design[2]	30.60	3,270.40
2021 Revised Project Design	1,412.66	12,241.80
Emission Change	1,382.06	8,971.40
Activity 5: Recovery Facilities / Extraction Wells / Recovery		
2017 Original Project Design[2]	1,260.59	18,726.40
2021 Revised Project Design	3,575.54	30,751.31
Emission Change	2,314.95	12,024.91
Subtotal of Activities 1,2,5 (overlap Year 1, months 1-3)		
2017 Original Project Design[2]	-	37,049.60
2021 Revised Project Design	-	49,074.51
Subtotal of Activities 3,5 (overlap Year 1, months 11,12)		
2017 Original Project Design[2]	-	27,350.40
2021 Revised Project Design	-	40,842.84
Subtotal of Activities 3,5,6 (overlap Year 2, months 1-5)		
2017 Original Project Design[2]	-	38,214.40
2021 Revised Project Design	-	51,706.84
Subtotal of Activities 4.5,6 (overlap Year 2, month 6)		
2017 Original Project Design[2]	-	32,860.80
2021 Revised Project Design	-	53,857.11
2017 Maximum Construction Emissions[2]	4,815.00	38,214.40
2021 Maximum Construction Emissions	**8,820.08**	**53,857.11**
Change in Maximum Construction Emissions	4,005.08	15,642.71
AVAQMD Thresholds	**100,000.00**	**548,000.00**
Exceeds Thresholds	No	No

Notes:
[1] Source: CalEEMod Version 2020.4.0
[2] Source: 2017 AECOM – Air Quality Technical Memorandum

6.0 Conclusions

Construction project emissions were evaluated and compared to regional AVAQMD's thresholds of significance. In addition, project GHG emissions were evaluated and compared to AVAQMD's draft thresholds of 100,000 $MTCO_2e$ per year and 548,000 pounds CO_2e per day year for all land uses. Project

emissions are anticipated to be below AVAQMD's thresholds of significance with use of Mitigation Measure AQ-1. Therefore, the impact is less than significant.

MD is pleased to provide this focused Air Quality and Greenhouse Gas. If you have any questions regarding this analysis, please don't hesitate to call us at (805) 426-4477.

Sincerely,
MD Acoustics, LLC

Mike Dickerson, INCE
Principal

Tyler Klassen
Air Quality Specialist

Appendix A

Glossary of Terms

AQMP	Air Quality Management Plan
AVAQMD	Antelope Valley Air Quality Management District
CAAQS	California Ambient Air Quality Standards
CARB	California Air Resources Board
CEQA	California Environmental Quality Act
CFCs	Chlorofluorocarbons
CH_4	Methane
CNG	Compressed natural gas
CO	Carbon monoxide
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DPM	Diesel particulate matter
GHG	Greenhouse gas
HFCs	Hydrofluorocarbons
LST	Localized Significant Thresholds
$MTCO_2e$	Metric tons of carbon dioxide equivalent
$MMTCO_2e$	Million metric tons of carbon dioxide equivalent
NAAQS	National Ambient Air Quality Standards
NOx	Nitrogen Oxides
NO_2	Nitrogen dioxide
N_2O	Nitrous oxide
O_3	Ozone
PFCs	Perfluorocarbons
PM	Particle matter
PM10	Particles that are less than 10 micrometers in diameter
PM2.5	Particles that are less than 2.5 micrometers in diameter
PMI	Point of maximum impact
PPM	Parts per million
PPB	Parts per billion
RTIP	Regional Transportation Improvement Plan
RTP	Regional Transportation Plan
SCAB	South Coast Air Basin
SCAQMD	South Coast Air Quality Management District
SF_6	Sulfur hexafluoride
SIP	State Implementation Plan
SOx	Sulfur Oxides
SRA	Source/Receptor Area
TAC	Toxic air contaminants
VOC	Volatile organic compounds
WRCC	Western Regional Climate Center

Appendix B

CalEEMod Outputs – Activity 3

AVEK - Transmission Facility - Antelope Valley APCD Air District, Summer

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

AVEK - Transmission Facility

Antelope Valley APCD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	27.00	Acre	27.00	1,176,120.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Proposed Undergroud Pipelines/Trenching [Transmission Facility, Table 2.4-2]

Land Use - Per AVEK AECOM AQ technical memo, 27 acres for this phase

Construction Phase - Per project schedule, estimated construction is from August 2022 through September 2023

Off-road Equipment - Per AVEK AECOM Technical AQ Memo -
2 graders (174 hp, 6 hours per day)
3 belly scraper (313 hp, 4 hours per day)
2 wheeled loaders (165 hp, 8 hours per day)

Date: 9/15/2021 10:02 AM

AVEK - Transmission Facility - Antelope Valley APCD Air District, Summer

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

Off-road Equipment - Per AVEK AECOM Technical AQ Memo -
2 cranes (190 hp, 2 hours per day)
2 hydraulic excavators (180 hp, 6 hours per day)
2 graders (174 hp, 6 hours per day)
1 off-highway truck (479 hp, 4 hours per day)
2 water trucks (200 hp, 4 hours per day)
3 belly scrapers (313 hp, 4 hours per day)
2 wheeled loaders (165 hp, 8 hours per day)
1 skip loader (88 hp, 3 hours per day)
4 backhoes (108 hp, 5 hours per day)

Grading - Excess spoil from excavation operations will be incorporated into the recharge basin berms and thus will not be hauled off site.

Trips and VMT - Per AECOM 2017 Air Quality Report, 60 worker trips and 4 delivery trips at 60 miles in length

Construction Off-road Equipment Mitigation - Per AVEK AECOM 2017 technical memorandum, AQ-1 mitigation measure applied.

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstructionPhase	NumDays	45.00	305.00
tblConstructionPhase	PhaseEndDate	9/30/2022	9/30/2023
tblConstructionPhase	PhaseEndDate	9/30/2022	9/30/2023

AVEK - Transmission Facility - Antelope Valley APCD Air District, Summer

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

tblConstructionPhase	PhaseStartDate	10/1/2022	8/1/2022
tblGrading	AcresOfGrading	686.25	27.00
tblOffRoadEquipment	HorsePower	187.00	174.00
tblOffRoadEquipment	HorsePower	367.00	313.00
tblOffRoadEquipment	HorsePower	97.00	165.00
tblOffRoadEquipment	HorsePower	231.00	190.00
tblOffRoadEquipment	HorsePower	158.00	180.00
tblOffRoadEquipment	HorsePower	402.00	479.00
tblOffRoadEquipment	HorsePower	402.00	200.00
tblOffRoadEquipment	HorsePower	65.00	88.00
tblOffRoadEquipment	HorsePower	97.00	108.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripLength	6.60	60.00
tblTripsAndVMT	VendorTripLength	6.60	60.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

AVEK - Transmission Facility - Antelope Valley APCD Air District, Summer

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	N2O	CO2e
Year	lb/day										lb/day					
2022	4.4711	38.6260	44.6479	0.1016	2.5043	1.6897	4.1940	0.6542	1.5551	2.2092	0.0000	9,990.0047	9,990.0047	2.3836	0.1407	10,091.5311
2023	4.1484	34.4955	43.2269	0.1007	2.5043	1.4846	3.9889	0.6542	1.3661	2.0202	0.0000	9,912.8649	9,912.8649	2.3780	0.1323	10,011.7264
Maximum	**4.4711**	**38.6260**	**44.6479**	**0.1016**	**2.5043**	**1.6897**	**4.1940**	**0.6542**	**1.5551**	**2.2092**	**0.0000**	**9,990.0047**	**9,990.0047**	**2.3836**	**0.1407**	**10,091.5311**

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	1.8406	26.5078	56.0936	0.1016	2.5043	0.1493	2.6536	0.6542	0.1477	0.8018	0.0000	9,990.0047	9,990.0047	2.3836	0.1407	10,091.5311
2023	1.7734	26.1864	55.1581	0.1007	2.5043	0.1401	2.6444	0.6542	0.1389	0.7930	0.0000	9,912.8649	9,912.8649	2.3780	0.1323	10,011.7264
Maximum	**1.8406**	**26.5078**	**56.0936**	**0.1016**	**2.5043**	**0.1493**	**2.6536**	**0.6542**	**0.1477**	**0.8018**	**0.0000**	**9,990.0047**	**9,990.0047**	**2.3836**	**0.1407**	**10,091.5311**

	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	**58.07**	**27.94**	**-26.60**	**0.00**	**0.00**	**90.88**	**35.26**	**0.00**	**90.19**	**62.29**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

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AVEK - Transmission Facility - Antelope Valley APCD Air District, Summer

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

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	8/1/2022	9/30/2023	5	305	
2	Site Preparation	Trenching	8/1/2022	9/30/2023	5	305	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 27

Acres of Paving: 27

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
Grading	Graders	2	6.00	174	0.41
Grading	Scrapers	3	4.00	313	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	165	0.37
Site Preparation	Cranes	2	2.00	190	0.29
Site Preparation	Excavators	2	6.00	180	0.38
Site Preparation	Off-Highway Trucks	1	4.00	479	0.38
Site Preparation	Off-Highway Trucks	2	4.00	200	0.38
Site Preparation	Skid Steer Loaders	1	3.00	88	0.37
Site Preparation	Tractors/Loaders/Backhoes	4	5.00	108	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	7	18.00	2.00	0.00	60.00	60.00	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	12	30.00	2.00	0.00	60.00	60.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

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AVEK - Transmission Facility - Antelope Valley APCD Air District, Summer

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

Use Cleaner Engines for Construction Equipment

3.2 Grading - 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					0.0939	0.0000	0.0939	0.0101	0.0000	0.0101			0.0000			0.0000
Off-Road	2.3096	23.0008	21.3801	0.0392		1.0714	1.0714		0.9857	0.9857		3,791.5456	3,791.5456	1.2263		3,822.2022
Total	**2.3096**	**23.0008**	**21.3801**	**0.0392**	**0.0939**	**1.0714**	**1.1653**	**0.0101**	**0.9857**	**0.9958**		**3,791.5456**	**3,791.5456**	**1.2263**		**3,822.2022**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0175	0.5642	0.1185	2.9700e-003	0.1110	7.1100e-003	0.1181	0.0319	6.8000e-003	0.0387		313.5020	313.5020	1.7600e-003	0.0451	326.9899
Worker	0.2282	0.2145	3.6109	7.9500e-003	0.8207	4.9600e-003	0.8256	0.2176	4.5700e-003	0.2221		808.4070	808.4070	0.0184	0.0189	814.5107
Total	**0.2456**	**0.7787**	**3.7293**	**0.0109**	**0.9317**	**0.0121**	**0.9437**	**0.2495**	**0.0114**	**0.2609**		**1,121.9090**	**1,121.9090**	**0.0202**	**0.0641**	**1,141.5006**

AVEK - Transmission Facility - Antelope Valley APCD Air District, Summer

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

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					0.0939	0.0000	0.0939	0.0101	0.0000	0.0101			0.0000			0.0000
Off-Road	0.5604	13.8151	25.2851	0.0392		0.0641	0.0641		0.0641	0.0641	0.0000	3,791.5456	3,791.5456	1.2263		3,822.2022
Total	**0.5604**	**13.8151**	**25.2851**	**0.0392**	**0.0939**	**0.0641**	**0.1580**	**0.0101**	**0.0641**	**0.0743**	**0.0000**	**3,791.5456**	**3,791.5456**	**1.2263**		**3,822.2022**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0175	0.5642	0.1185	2.9700e-003	0.1110	7.1100e-003	0.1181	0.0319	6.8000e-003	0.0387		313.5020	313.5020	1.7600e-003	0.0451	326.9899
Worker	0.2282	0.2145	3.6109	7.9500e-003	0.8207	4.9600e-003	0.8256	0.2176	4.5700e-003	0.2221		808.4070	808.4070	0.0184	0.0189	814.5107
Total	**0.2456**	**0.7787**	**3.7293**	**0.0109**	**0.9317**	**0.0121**	**0.9437**	**0.2495**	**0.0114**	**0.2609**		**1,121.9090**	**1,121.9090**	**0.0202**	**0.0641**	**1,141.5006**

3.2 Grading - 2023

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AVEK - Transmission Facility - Antelope Valley APCD Air District, Summer

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

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					0.0939	0.0000	0.0939	0.0101	0.0000	0.0101			0.0000			0.0000
Off-Road	2.1389	20.5682	20.9902	0.0392		0.9489	0.9489		0.8730	0.8730		3,793.3368	3,793.3368	1.2268		3,824.0079
Total	**2.1389**	**20.5682**	**20.9902**	**0.0392**	**0.0939**	**0.9489**	**1.0428**	**0.0101**	**0.8730**	**0.8832**		**3,793.3368**	**3,793.3368**	**1.2268**		**3,824.0079**

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	7.4900e-003	0.4384	0.0857	2.8500e-003	0.1110	2.8900e-003	0.1139	0.0319	2.7600e-003	0.0347		301.0844	301.0844	1.2500e-003	0.0431	313.9590
Worker	0.2105	0.1883	3.2846	7.7000e-003	0.8207	4.6800e-003	0.8254	0.2176	4.3100e-003	0.2219		787.5188	787.5188	0.0163	0.0173	793.0728
Total	**0.2179**	**0.6268**	**3.3703**	**0.0106**	**0.9317**	**7.5700e-003**	**0.9392**	**0.2495**	**7.0700e-003**	**0.2566**		**1,088.6032**	**1,088.6032**	**0.0175**	**0.0604**	**1,107.0317**

Mitigated Construction On-Site

AVEK - Transmission Facility - Antelope Valley APCD Air District, Summer

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	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0939	0.0000	0.0939	0.0101	0.0000	0.0101			0.0000			0.0000
Off-Road	0.5604	13.8151	25.2851	0.0392		0.0641	0.0641		0.0641	0.0641	0.0000	3,793.3368	3,793.3368	1.2268		3,824.0079
Total	**0.5604**	**13.8151**	**25.2851**	**0.0392**	**0.0939**	**0.0641**	**0.1580**	**0.0101**	**0.0641**	**0.0743**	**0.0000**	**3,793.3368**	**3,793.3368**	**1.2268**		**3,824.0079**

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	7.4900e-003	0.4384	0.0857	2.8500e-003	0.1110	2.8900e-003	0.1139	0.0319	2.7600e-003	0.0347		301.0844	301.0844	1.2500e-003	0.0431	313.9590
Worker	0.2105	0.1883	3.2846	7.7000e-003	0.8207	4.6800e-003	0.8254	0.2176	4.3100e-003	0.2219		787.5188	787.5188	0.0163	0.0173	793.0728
Total	**0.2179**	**0.6268**	**3.3703**	**0.0106**	**0.9317**	**7.5700e-003**	**0.9392**	**0.2495**	**7.0700e-003**	**0.2566**		**1,088.6032**	**1,088.6032**	**0.0175**	**0.0604**	**1,107.0317**

3.3 Site Preparation - 2022

Unmitigated Construction On-Site

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AVEK - Transmission Facility - Antelope Valley APCD Air District, Summer

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	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5181	13.9247	13.4019	0.0353		0.5909	0.5909		0.5436	0.5436		3,415.7030	3,415.7030	1.1047		3,443.3207
Total	**1.5181**	**13.9247**	**13.4019**	**0.0353**		**0.5909**	**0.5909**		**0.5436**	**0.5436**		**3,415.7030**	**3,415.7030**	**1.1047**		**3,443.3207**

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	0.0175	0.5642	0.1185	2.9700e-003	0.1110	7.1100e-003	0.1181	0.0319	6.8000e-003	0.0387		313.5020	313.5020	1.7600e-003	0.0451	326.9899
Worker	0.3803	0.3576	6.0181	0.0132	1.3678	8.2700e-003	1.3761	0.3626	7.6100e-003	0.3702		1,347.3451	1,347.3451	0.0307	0.0316	1,357.5178
Total	**0.3977**	**0.9218**	**6.1366**	**0.0162**	**1.4788**	**0.0154**	**1.4941**	**0.3945**	**0.0144**	**0.4089**		**1,660.8471**	**1,660.8471**	**0.0325**	**0.0767**	**1,684.5077**

Mitigated Construction On-Site

AVEK - Transmission Facility - Antelope Valley APCD Air District, Summer

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	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6368	10.9923	20.9426	0.0353		0.0578	0.0578		0.0578	0.0578	0.0000	3,415.7030	3,415.7030	1.1047		3,443.3207
Total	**0.6368**	**10.9923**	**20.9426**	**0.0353**		**0.0578**	**0.0578**		**0.0578**	**0.0578**	**0.0000**	**3,415.7030**	**3,415.7030**	**1.1047**		**3,443.3207**

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	0.0175	0.5642	0.1185	2.9700e-003	0.1110	7.1100e-003	0.1181	0.0319	6.8000e-003	0.0387		313.5020	313.5020	1.7600e-003	0.0451	326.9899
Worker	0.3803	0.3576	6.0181	0.0132	1.3678	8.2700e-003	1.3761	0.3626	7.6100e-003	0.3702		1,347.3451	1,347.3451	0.0307	0.0316	1,357.5178
Total	**0.3977**	**0.9218**	**6.1366**	**0.0162**	**1.4788**	**0.0154**	**1.4941**	**0.3945**	**0.0144**	**0.4089**		**1,660.8471**	**1,660.8471**	**0.0325**	**0.0767**	**1,684.5077**

3.3 Site 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					

AVEK - Transmission Facility - Antelope Valley APCD Air District, Summer

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

Off-Road	1.4333	12.5482	13.3063	0.0353		0.5174	0.5174		0.4760	0.4760		3,417.3092	3,417.3092	1.1052		3,444.9399
Total	**1.4333**	**12.5482**	**13.3063**	**0.0353**		**0.5174**	**0.5174**		**0.4760**	**0.4760**		**3,417.3092**	**3,417.3092**	**1.1052**		**3,444.9399**

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	7.4900e-003	0.4384	0.0857	2.8500e-003	0.1110	2.8900e-003	0.1139	0.0319	2.7600e-003	0.0347		301.0844	301.0844	1.2500e-003	0.0431	313.9590
Worker	0.3508	0.3139	5.4743	0.0128	1.3678	7.8000e-003	1.3756	0.3626	7.1800e-003	0.3698		1,312.5313	1,312.5313	0.0271	0.0288	1,321.7880
Total	**0.3582**	**0.7523**	**5.5601**	**0.0157**	**1.4788**	**0.0107**	**1.4895**	**0.3945**	**9.9400e-003**	**0.4045**		**1,613.6157**	**1,613.6157**	**0.0284**	**0.0719**	**1,635.7469**

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	0.6368	10.9923	20.9426	0.0353		0.0578	0.0578		0.0578	0.0578	0.0000	3,417.3092	3,417.3092	1.1052		3,444.9399
Total	**0.6368**	**10.9923**	**20.9426**	**0.0353**		**0.0578**	**0.0578**		**0.0578**	**0.0578**	**0.0000**	**3,417.3092**	**3,417.3092**	**1.1052**		**3,444.9399**

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AVEK - Transmission Facility - Antelope Valley APCD Air District, Summer

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

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	7.4900e-003	0.4384	0.0857	2.8500e-003	0.1110	2.8900e-003	0.1139	0.0319	2.7600e-003	0.0347		301.0844	301.0844	1.2500e-003	0.0431	313.9590
Worker	0.3508	0.3139	5.4743	0.0128	1.3678	7.8000e-003	1.3756	0.3626	7.1800e-003	0.3698		1,312.5313	1,312.5313	0.0271	0.0288	1,321.7880
Total	**0.3582**	**0.7523**	**5.5601**	**0.0157**	**1.4788**	**0.0107**	**1.4895**	**0.3945**	**9.9400e-003**	**0.4045**		**1,613.6157**	**1,613.6157**	**0.0284**	**0.0719**	**1,635.7469**

AVEK - Transmission Facility - Antelope Valley APCD Air District, Winter

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

AVEK - Transmission Facility

Antelope Valley APCD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	27.00	Acre	27.00	1,176,120.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Proposed Undergroud Pipelines/Trenching [Transmission Facility, Table 2.4-2]

Land Use - Per AVEK AECOM AQ technical memo, 27 acres for this phase

Construction Phase - Per project schedule, estimated construction is from August 2022 through September 2023

Off-road Equipment - Per AVEK AECOM Technical AQ Memo -
2 graders (174 hp, 6 hours per day)
3 belly scraper (313 hp, 4 hours per day)
2 wheeled loaders (165 hp, 8 hours per day)

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AVEK - Transmission Facility - Antelope Valley APCD Air District, Winter

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

Off-road Equipment - Per AVEK AECOM Technical AQ Memo -
2 cranes (190 hp, 2 hours per day)
2 hydraulic excavators (180 hp, 6 hours per day)
2 graders (174 hp, 6 hours per day)
1 off-highway truck (479 hp, 4 hours per day)
2 water trucks (200 hp, 4 hours per day)
3 belly scrapers (313 hp, 4 hours per day)
2 wheeled loaders (165 hp, 8 hours per day)
1 skip loader (88 hp, 3 hours per day)
4 backhoes (108 hp, 5 hours per day)

Grading - Excess spoil from excavation operations will be incorporated into the recharge basin berms and thus will not be hauled off site.

Trips and VMT - Per AECOM 2017 Air Quality Report, 60 worker trips and 4 delivery trips at 60 miles in length

Construction Off-road Equipment Mitigation - Per AVEK AECOM 2017 technical memorandum, AQ-1 mitigation measure applied.

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstructionPhase	NumDays	45.00	305.00
tblConstructionPhase	PhaseEndDate	9/30/2022	9/30/2023
tblConstructionPhase	PhaseEndDate	9/30/2022	9/30/2023

AVEK - Transmission Facility - Antelope Valley APCD Air District, Winter

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

tblConstructionPhase	PhaseStartDate	10/1/2022	8/1/2022
tblGrading	AcresOfGrading	686.25	27.00
tblOffRoadEquipment	HorsePower	187.00	174.00
tblOffRoadEquipment	HorsePower	367.00	313.00
tblOffRoadEquipment	HorsePower	97.00	165.00
tblOffRoadEquipment	HorsePower	231.00	190.00
tblOffRoadEquipment	HorsePower	158.00	180.00
tblOffRoadEquipment	HorsePower	402.00	479.00
tblOffRoadEquipment	HorsePower	402.00	200.00
tblOffRoadEquipment	HorsePower	65.00	88.00
tblOffRoadEquipment	HorsePower	97.00	108.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripLength	6.60	60.00
tblTripsAndVMT	VendorTripLength	6.60	60.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

AVEK - Transmission Facility - Antelope Valley APCD Air District, 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	N2O	CO2e
Year	lb/day										lb/day					
2022	4.4702	38.7147	42.3320	0.0992	2.5043	1.6897	4.1940	0.6542	1.5551	2.2092	0.0000	9,752.3479	9,752.3479	2.3780	0.1424	9,854.2436
2023	4.1504	34.5684	41.1198	0.0985	2.5043	1.4846	3.9889	0.6542	1.3661	2.0202	0.0000	9,682.1815	9,682.1815	2.3731	0.1338	9,781.3840
Maximum	**4.4702**	**38.7147**	**42.3320**	**0.0992**	**2.5043**	**1.6897**	**4.1940**	**0.6542**	**1.5551**	**2.2092**	**0.0000**	**9,752.3479**	**9,752.3479**	**2.3780**	**0.1424**	**9,854.2436**

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	1.8396	26.5965	53.7777	0.0992	2.5043	0.1493	2.6536	0.6542	0.1477	0.8018	0.0000	9,752.3479	9,752.3479	2.3780	0.1424	9,854.2436
2023	1.7754	26.2594	53.0510	0.0985	2.5043	0.1401	2.6444	0.6542	0.1389	0.7930	0.0000	9,682.1815	9,682.1815	2.3731	0.1338	9,781.3840
Maximum	**1.8396**	**26.5965**	**53.7777**	**0.0992**	**2.5043**	**0.1493**	**2.6536**	**0.6542**	**0.1477**	**0.8018**	**0.0000**	**9,752.3479**	**9,752.3479**	**2.3780**	**0.1424**	**9,854.2436**

	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	**58.07**	**27.87**	**-28.01**	**0.00**	**0.00**	**90.88**	**35.26**	**0.00**	**90.19**	**62.29**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

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AVEK - Transmission Facility - Antelope Valley APCD Air District, Winter

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

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	8/1/2022	9/30/2023	5	305	
2	Site Preparation	Trenching	8/1/2022	9/30/2023	5	305	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 27

Acres of Paving: 27

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
Grading	Graders	2	6.00	174	0.41
Grading	Scrapers	3	4.00	313	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	165	0.37
Site Preparation	Cranes	2	2.00	190	0.29
Site Preparation	Excavators	2	6.00	180	0.38
Site Preparation	Off-Highway Trucks	1	4.00	479	0.38
Site Preparation	Off-Highway Trucks	2	4.00	200	0.38
Site Preparation	Skid Steer Loaders	1	3.00	88	0.37
Site Preparation	Tractors/Loaders/Backhoes	4	5.00	108	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	7	18.00	2.00	0.00	60.00	60.00	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	12	30.00	2.00	0.00	60.00	60.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

AVEK - Transmission Facility - Antelope Valley APCD Air District, Winter

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

Use Cleaner Engines for Construction Equipment

3.2 Grading - 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					0.0939	0.0000	0.0939	0.0101	0.0000	0.0101			0.0000			0.0000
Off-Road	2.3096	23.0008	21.3801	0.0392		1.0714	1.0714		0.9857	0.9857		3,791.5456	3,791.5456	1.2263		3,822.2022
Total	**2.3096**	**23.0008**	**21.3801**	**0.0392**	**0.0939**	**1.0714**	**1.1653**	**0.0101**	**0.9857**	**0.9958**		**3,791.5456**	**3,791.5456**	**1.2263**		**3,822.2022**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0174	0.5930	0.1187	2.9700e-003	0.1110	7.1100e-003	0.1181	0.0319	6.8000e-003	0.0387		313.5629	313.5629	1.7500e-003	0.0452	327.0652
Worker	0.2279	0.2262	2.7423	7.0700e-003	0.8207	4.9600e-003	0.8256	0.2176	4.5700e-003	0.2221		719.2401	719.2401	0.0163	0.0195	725.4714
Total	**0.2453**	**0.8192**	**2.8609**	**0.0100**	**0.9317**	**0.0121**	**0.9437**	**0.2495**	**0.0114**	**0.2609**		**1,032.8030**	**1,032.8030**	**0.0181**	**0.0647**	**1,052.5366**

AVEK - Transmission Facility - Antelope Valley APCD Air District, Winter

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

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					0.0939	0.0000	0.0939	0.0101	0.0000	0.0101			0.0000			0.0000
Off-Road	0.5604	13.8151	25.2851	0.0392		0.0641	0.0641		0.0641	0.0641	0.0000	3,791.5456	3,791.5456	1.2263		3,822.2022
Total	**0.5604**	**13.8151**	**25.2851**	**0.0392**	**0.0939**	**0.0641**	**0.1580**	**0.0101**	**0.0641**	**0.0743**	**0.0000**	**3,791.5456**	**3,791.5456**	**1.2263**		**3,822.2022**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0174	0.5930	0.1187	2.9700e-003	0.1110	7.1100e-003	0.1181	0.0319	6.8000e-003	0.0387		313.5629	313.5629	1.7500e-003	0.0452	327.0652
Worker	0.2279	0.2262	2.7423	7.0700e-003	0.8207	4.9600e-003	0.8256	0.2176	4.5700e-003	0.2221		719.2401	719.2401	0.0163	0.0195	725.4714
Total	**0.2453**	**0.8192**	**2.8609**	**0.0100**	**0.9317**	**0.0121**	**0.9437**	**0.2495**	**0.0114**	**0.2609**		**1,032.8030**	**1,032.8030**	**0.0181**	**0.0647**	**1,052.5366**

3.2 Grading - 2023

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AVEK - Transmission Facility - Antelope Valley APCD Air District, Winter

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

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					0.0939	0.0000	0.0939	0.0101	0.0000	0.0101			0.0000			0.0000
Off-Road	2.1389	20.5682	20.9902	0.0392		0.9489	0.9489		0.8730	0.8730		3,793.3368	3,793.3368	1.2268		3,824.0079
Total	**2.1389**	**20.5682**	**20.9902**	**0.0392**	**0.0939**	**0.9489**	**1.0428**	**0.0101**	**0.8730**	**0.8832**		**3,793.3368**	**3,793.3368**	**1.2268**		**3,824.0079**

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	7.3800e-003	0.4614	0.0859	2.8600e-003	0.1110	2.8900e-003	0.1139	0.0319	2.7600e-003	0.0347		301.1909	301.1909	1.2400e-003	0.0432	314.0806
Worker	0.2113	0.1985	2.4943	6.8500e-003	0.8207	4.6800e-003	0.8254	0.2176	4.3100e-003	0.2219		700.9326	700.9326	0.0145	0.0178	706.6032
Total	**0.2187**	**0.6599**	**2.5802**	**9.7100e-003**	**0.9317**	**7.5700e-003**	**0.9392**	**0.2495**	**7.0700e-003**	**0.2566**		**1,002.1235**	**1,002.1235**	**0.0157**	**0.0610**	**1,020.6837**

Mitigated Construction On-Site

AVEK - Transmission Facility - Antelope Valley APCD Air District, 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	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0939	0.0000	0.0939	0.0101	0.0000	0.0101			0.0000			0.0000
Off-Road	0.5604	13.8151	25.2851	0.0392		0.0641	0.0641		0.0641	0.0641	0.0000	3,793.3368	3,793.3368	1.2268		3,824.0079
Total	**0.5604**	**13.8151**	**25.2851**	**0.0392**	**0.0939**	**0.0641**	**0.1580**	**0.0101**	**0.0641**	**0.0743**	**0.0000**	**3,793.3368**	**3,793.3368**	**1.2268**		**3,824.0079**

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	7.3800e-003	0.4614	0.0859	2.8600e-003	0.1110	2.8900e-003	0.1139	0.0319	2.7600e-003	0.0347		301.1909	301.1909	1.2400e-003	0.0432	314.0806
Worker	0.2113	0.1985	2.4943	6.8500e-003	0.8207	4.6800e-003	0.8254	0.2176	4.3100e-003	0.2219		700.9326	700.9326	0.0145	0.0178	706.6032
Total	**0.2187**	**0.6599**	**2.5802**	**9.7100e-003**	**0.9317**	**7.5700e-003**	**0.9392**	**0.2495**	**7.0700e-003**	**0.2566**		**1,002.1235**	**1,002.1235**	**0.0157**	**0.0610**	**1,020.6837**

3.3 Site Preparation - 2022

Unmitigated Construction On-Site

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AVEK - Transmission Facility - Antelope Valley APCD Air District, 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	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5181	13.9247	13.4019	0.0353		0.5909	0.5909		0.5436	0.5436		3,415.7030	3,415.7030	1.1047		3,443.3207
Total	**1.5181**	**13.9247**	**13.4019**	**0.0353**		**0.5909**	**0.5909**		**0.5436**	**0.5436**		**3,415.7030**	**3,415.7030**	**1.1047**		**3,443.3207**

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	0.0174	0.5930	0.1187	2.9700e-003	0.1110	7.1100e-003	0.1181	0.0319	6.8000e-003	0.0387		313.5629	313.5629	1.7500e-003	0.0452	327.0652
Worker	0.3798	0.3770	4.5704	0.0118	1.3678	8.2700e-003	1.3761	0.3626	7.6100e-003	0.3702		1,198.7335	1,198.7335	0.0272	0.0326	1,209.1191
Total	**0.3972**	**0.9700**	**4.6891**	**0.0148**	**1.4788**	**0.0154**	**1.4941**	**0.3945**	**0.0144**	**0.4089**		**1,512.2964**	**1,512.2964**	**0.0290**	**0.0777**	**1,536.1842**

Mitigated Construction On-Site

AVEK - Transmission Facility - Antelope Valley APCD Air District, 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	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6368	10.9923	20.9426	0.0353		0.0578	0.0578		0.0578	0.0578	0.0000	3,415.7030	3,415.7030	1.1047		3,443.3207
Total	**0.6368**	**10.9923**	**20.9426**	**0.0353**		**0.0578**	**0.0578**		**0.0578**	**0.0578**	**0.0000**	**3,415.7030**	**3,415.7030**	**1.1047**		**3,443.3207**

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	0.0174	0.5930	0.1187	2.9700e-003	0.1110	7.1100e-003	0.1181	0.0319	6.8000e-003	0.0387		313.5629	313.5629	1.7500e-003	0.0452	327.0652
Worker	0.3798	0.3770	4.5704	0.0118	1.3678	8.2700e-003	1.3761	0.3626	7.6100e-003	0.3702		1,198.7335	1,198.7335	0.0272	0.0326	1,209.1191
Total	**0.3972**	**0.9700**	**4.6891**	**0.0148**	**1.4788**	**0.0154**	**1.4941**	**0.3945**	**0.0144**	**0.4089**		**1,512.2964**	**1,512.2964**	**0.0290**	**0.0777**	**1,536.1842**

3.3 Site 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					

AVEK - Transmission Facility - Antelope Valley APCD Air District, Winter

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

Off-Road	1.4333	12.5482	13.3063	0.0353		0.5174	0.5174		0.4760	0.4760		3,417.3092	3,417.3092	1.1052		3,444.9399
Total	**1.4333**	**12.5482**	**13.3063**	**0.0353**		**0.5174**	**0.5174**		**0.4760**	**0.4760**		**3,417.3092**	**3,417.3092**	**1.1052**		**3,444.9399**

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	7.3800e-003	0.4614	0.0859	2.8600e-003	0.1110	2.8900e-003	0.1139	0.0319	2.7600e-003	0.0347		301.1909	301.1909	1.2400e-003	0.0432	314.0806
Worker	0.3521	0.3309	4.1572	0.0114	1.3678	7.8000e-003	1.3756	0.3626	7.1800e-003	0.3698		1,168.2211	1,168.2211	0.0241	0.0297	1,177.6720
Total	**0.3595**	**0.7922**	**4.2431**	**0.0143**	**1.4788**	**0.0107**	**1.4895**	**0.3945**	**9.9400e-003**	**0.4045**		**1,469.4120**	**1,469.4120**	**0.0253**	**0.0728**	**1,491.7525**

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	0.6368	10.9923	20.9426	0.0353		0.0578	0.0578		0.0578	0.0578	0.0000	3,417.3092	3,417.3092	1.1052		3,444.9399
Total	**0.6368**	**10.9923**	**20.9426**	**0.0353**		**0.0578**	**0.0578**		**0.0578**	**0.0578**	**0.0000**	**3,417.3092**	**3,417.3092**	**1.1052**		**3,444.9399**

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AVEK - Transmission Facility - Antelope Valley APCD Air District, Winter

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

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	7.3800e-003	0.4614	0.0859	2.8600e-003	0.1110	2.8900e-003	0.1139	0.0319	2.7600e-003	0.0347		301.1909	301.1909	1.2400e-003	0.0432	314.0806
Worker	0.3521	0.3309	4.1572	0.0114	1.3678	7.8000e-003	1.3756	0.3626	7.1800e-003	0.3698		1,168.2211	1,168.2211	0.0241	0.0297	1,177.6720
Total	**0.3595**	**0.7922**	**4.2431**	**0.0143**	**1.4788**	**0.0107**	**1.4895**	**0.3945**	**9.9400e-003**	**0.4045**		**1,469.4120**	**1,469.4120**	**0.0253**	**0.0728**	**1,491.7525**

AVEK - Transmission Facility - Antelope Valley APCD Air District, Annual

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

AVEK - Transmission Facility

Antelope Valley APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	27.00	Acre	27.00	1,176,120.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Proposed Undergroud Pipelines/Trenching [Transmission Facility, Table 2.4-2]

Land Use - Per AVEK AECOM AQ technical memo, 27 acres for this phase

Construction Phase - Per project schedule, estimated construction is from August 2022 through September 2023

Off-road Equipment - Per AVEK AECOM Technical AQ Memo -
2 graders (174 hp, 6 hours per day)
3 belly scraper (313 hp, 4 hours per day)
2 wheeled loaders (165 hp, 8 hours per day)

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AVEK - Transmission Facility - Antelope Valley APCD Air District, Annual

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

Off-road Equipment - Per AVEK AECOM Technical AQ Memo -
2 cranes (190 hp, 2 hours per day)
2 hydraulic excavators (180 hp, 6 hours per day)
2 graders (174 hp, 6 hours per day)
1 off-highway truck (479 hp, 4 hours per day)
2 water trucks (200 hp, 4 hours per day)
3 belly scrapers (313 hp, 4 hours per day)
2 wheeled loaders (165 hp, 8 hours per day)
1 skip loader (88 hp, 3 hours per day)
4 backhoes (108 hp, 5 hours per day)

Grading - Excess spoil from excavation operations will be incorporated into the recharge basin berms and thus will not be hauled off site.

Trips and VMT - Per AECOM 2017 Air Quality Report, 60 worker trips and 4 delivery trips at 60 miles in length

Construction Off-road Equipment Mitigation - Per AVEK AECOM 2017 technical memorandum, AQ-1 mitigation measure applied.

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstructionPhase	NumDays	45.00	305.00
tblConstructionPhase	PhaseEndDate	9/30/2022	9/30/2023
tblConstructionPhase	PhaseEndDate	9/30/2022	9/30/2023

AVEK - Transmission Facility - Antelope Valley APCD Air District, Annual

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

tblConstructionPhase	PhaseStartDate	10/1/2022	8/1/2022
tblGrading	AcresOfGrading	686.25	27.00
tblOffRoadEquipment	HorsePower	187.00	174.00
tblOffRoadEquipment	HorsePower	367.00	313.00
tblOffRoadEquipment	HorsePower	97.00	165.00
tblOffRoadEquipment	HorsePower	231.00	190.00
tblOffRoadEquipment	HorsePower	158.00	180.00
tblOffRoadEquipment	HorsePower	402.00	479.00
tblOffRoadEquipment	HorsePower	402.00	200.00
tblOffRoadEquipment	HorsePower	65.00	88.00
tblOffRoadEquipment	HorsePower	97.00	108.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripLength	6.60	60.00
tblTripsAndVMT	VendorTripLength	6.60	60.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

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AVEK - Transmission Facility - Antelope Valley APCD Air District, Annual

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	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.2432	2.1322	2.3583	5.4900e-003	0.1443	0.0929	0.2373	0.0363	0.0855	0.1219	0.0000	489.3216	489.3216	0.1187	7.2300e-003	494.4430
2023	0.4001	3.3746	4.0577	9.6500e-003	0.2448	0.1448	0.3895	0.0632	0.1332	0.1964	0.0000	861.0827	861.0827	0.2100	0.0120	869.9170
Maximum	**0.4001**	**3.3746**	**4.0577**	**9.6500e-003**	**0.2448**	**0.1448**	**0.3895**	**0.0632**	**0.1332**	**0.1964**	**0.0000**	**861.0827**	**861.0827**	**0.2100**	**0.0120**	**869.9170**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.0985	1.4657	2.9878	5.4900e-003	0.1443	8.2100e-003	0.1525	0.0363	8.1200e-003	0.0445	0.0000	489.3212	489.3212	0.1187	7.2300e-003	494.4425
2023	0.1685	2.5645	5.2209	9.6500e-003	0.2448	0.0137	0.2585	0.0632	0.0135	0.0768	0.0000	861.0819	861.0819	0.2100	0.0120	869.9162
Maximum	**0.1685**	**2.5645**	**5.2209**	**9.6500e-003**	**0.2448**	**0.0137**	**0.2585**	**0.0632**	**0.0135**	**0.0768**	**0.0000**	**861.0819**	**861.0819**	**0.2100**	**0.0120**	**869.9162**

	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	**58.50**	**26.81**	**-27.94**	**0.00**	**0.00**	**90.80**	**34.43**	**0.00**	**90.10**	**61.91**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**8-1-2022**	**10-31-2022**	1.4170	0.9324
2	**11-1-2022**	**1-31-2023**	1.3695	0.9299
3	**2-1-2023**	**4-30-2023**	1.2299	0.8903

AVEK - Transmission Facility - Antelope Valley APCD Air District, Annual

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

4	**5-1-2023**	**7-31-2023**	1.2697	0.9187
5	**8-1-2023**	**9-30-2023**	0.8419	0.6091
		Highest	1.4170	0.9324

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	8/1/2022	9/30/2023	5	305	
2	Site Preparation	Trenching	8/1/2022	9/30/2023	5	305	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 27

Acres of Paving: 27

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
Grading	Graders	2	6.00	174	0.41
Grading	Scrapers	3	4.00	313	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	165	0.37
Site Preparation	Cranes	2	2.00	190	0.29
Site Preparation	Excavators	2	6.00	180	0.38
Site Preparation	Off-Highway Trucks	1	4.00	479	0.38
Site Preparation	Off-Highway Trucks	2	4.00	200	0.38
Site Preparation	Skid Steer Loaders	1	3.00	88	0.37
Site Preparation	Tractors/Loaders/Backhoes	4	5.00	108	0.37

Trips and VMT

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

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
Grading	7	18.00	2.00	0.00	60.00	60.00	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	12	30.00	2.00	0.00	60.00	60.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0143	0.0000	0.0143	1.5500e-003	0.0000	1.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1270	1.2651	1.1759	2.1500e-003		0.0589	0.0589		0.0542	0.0542	0.0000	189.1798	189.1798	0.0612	0.0000	190.7094
Total	**0.1270**	**1.2651**	**1.1759**	**2.1500e-003**	**0.0143**	**0.0589**	**0.0733**	**1.5500e-003**	**0.0542**	**0.0558**	**0.0000**	**189.1798**	**189.1798**	**0.0612**	**0.0000**	**190.7094**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

AVEK - Transmission Facility - Antelope Valley APCD Air District, Annual

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

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.5000e-004	0.0330	6.4900e-003	1.6000e-004	6.0100e-003	3.9000e-004	6.4000e-003	1.7300e-003	3.7000e-004	2.1000e-003	0.0000	15.6435	15.6435	9.0000e-005	2.2500e-003	16.3172
Worker	0.0115	0.0132	0.1621	4.0000e-004	0.0443	2.7000e-004	0.0445	0.0118	2.5000e-004	0.0120	0.0000	36.9105	36.9105	8.4000e-004	1.0200e-003	37.2353
Total	**0.0125**	**0.0462**	**0.1686**	**5.6000e-004**	**0.0503**	**6.6000e-004**	**0.0509**	**0.0135**	**6.2000e-004**	**0.0141**	**0.0000**	**52.5539**	**52.5539**	**9.3000e-004**	**3.2700e-003**	**53.5525**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0143	0.0000	0.0143	1.5500e-003	0.0000	1.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0308	0.7598	1.3907	2.1500e-003		3.5300e-003	3.5300e-003		3.5300e-003	3.5300e-003	0.0000	189.1796	189.1796	0.0612	0.0000	190.7092
Total	**0.0308**	**0.7598**	**1.3907**	**2.1500e-003**	**0.0143**	**3.5300e-003**	**0.0179**	**1.5500e-003**	**3.5300e-003**	**5.0800e-003**	**0.0000**	**189.1796**	**189.1796**	**0.0612**	**0.0000**	**190.7092**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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

Vendor	9.5000e-004	0.0330	6.4900e-003	1.6000e-004	6.0100e-003	3.9000e-004	6.4000e-003	1.7300e-003	3.7000e-004	2.1000e-003	0.0000	15.6435	15.6435	9.0000e-005	2.2500e-003	16.3172
Worker	0.0115	0.0132	0.1621	4.0000e-004	0.0443	2.7000e-004	0.0445	0.0118	2.5000e-004	0.0120	0.0000	36.9105	36.9105	8.4000e-004	1.0200e-003	37.2353
Total	**0.0125**	**0.0462**	**0.1686**	**5.6000e-004**	**0.0503**	**6.6000e-004**	**0.0509**	**0.0135**	**6.2000e-004**	**0.0141**	**0.0000**	**52.5539**	**52.5539**	**9.3000e-004**	**3.2700e-003**	**53.5525**

3.2 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	tons/yr										MT/yr					
Fugitive Dust					0.0143	0.0000	0.0143	1.5500e-003	0.0000	1.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2085	2.0054	2.0465	3.8200e-003		0.0925	0.0925		0.0851	0.0851	0.0000	335.5226	335.5226	0.1085	0.0000	338.2355
Total	**0.2085**	**2.0054**	**2.0465**	**3.8200e-003**	**0.0143**	**0.0925**	**0.1068**	**1.5500e-003**	**0.0851**	**0.0867**	**0.0000**	**335.5226**	**335.5226**	**0.1085**	**0.0000**	**338.2355**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.2000e-004	0.0455	8.3200e-003	2.8000e-004	0.0107	2.8000e-004	0.0109	3.0700e-003	2.7000e-004	3.3400e-003	0.0000	26.6350	26.6350	1.1000e-004	3.8200e-003	27.7751

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

Worker	0.0189	0.0206	0.2614	6.9000e-004	0.0784	4.6000e-004	0.0789	0.0208	4.2000e-004	0.0213	0.0000	63.7603	63.7603	1.3100e-003	1.6500e-003	64.2843
Total	**0.0196**	**0.0660**	**0.2697**	**9.7000e-004**	**0.0891**	**7.4000e-004**	**0.0898**	**0.0239**	**6.9000e-004**	**0.0246**	**0.0000**	**90.3953**	**90.3953**	**1.4200e-003**	**5.4700e-003**	**92.0593**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0143	0.0000	0.0143	1.5500e-003	0.0000	1.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0546	1.3470	2.4653	3.8200e-003		6.2500e-003	6.2500e-003		6.2500e-003	6.2500e-003	0.0000	335.5222	335.5222	0.1085	0.0000	338.2351
Total	**0.0546**	**1.3470**	**2.4653**	**3.8200e-003**	**0.0143**	**6.2500e-003**	**0.0206**	**1.5500e-003**	**6.2500e-003**	**7.8000e-003**	**0.0000**	**335.5222**	**335.5222**	**0.1085**	**0.0000**	**338.2351**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.2000e-004	0.0455	8.3200e-003	2.8000e-004	0.0107	2.8000e-004	0.0109	3.0700e-003	2.7000e-004	3.3400e-003	0.0000	26.6350	26.6350	1.1000e-004	3.8200e-003	27.7751
Worker	0.0189	0.0206	0.2614	6.9000e-004	0.0784	4.6000e-004	0.0789	0.0208	4.2000e-004	0.0213	0.0000	63.7603	63.7603	1.3100e-003	1.6500e-003	64.2843

AVEK - Transmission Facility - Antelope Valley APCD Air District, Annual

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

Total	**0.0196**	**0.0660**	**0.2697**	**9.7000e-004**	**0.0891**	**7.4000e-004**	**0.0898**	**0.0239**	**6.9000e-004**	**0.0246**	**0.0000**	**90.3953**	**90.3953**	**1.4200e-003**	**5.4700e-003**	**92.0593**

3.3 Site Preparation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0835	0.7659	0.7371	1.9400e-003		0.0325	0.0325		0.0299	0.0299	0.0000	170.4271	170.4271	0.0551	0.0000	171.8050
Total	**0.0835**	**0.7659**	**0.7371**	**1.9400e-003**		**0.0325**	**0.0325**		**0.0299**	**0.0299**	**0.0000**	**170.4271**	**170.4271**	**0.0551**	**0.0000**	**171.8050**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.5000e-004	0.0330	6.4900e-003	1.6000e-004	6.0100e-003	3.9000e-004	6.4000e-003	1.7300e-003	3.7000e-004	2.1000e-003	0.0000	15.6435	15.6435	9.0000e-005	2.2500e-003	16.3172
Worker	0.0192	0.0220	0.2702	6.7000e-004	0.0738	4.5000e-004	0.0742	0.0196	4.2000e-004	0.0200	0.0000	61.5174	61.5174	1.4000e-003	1.7000e-003	62.0588
Total	**0.0202**	**0.0550**	**0.2767**	**8.3000e-004**	**0.0798**	**8.4000e-004**	**0.0806**	**0.0213**	**7.9000e-004**	**0.0221**	**0.0000**	**77.1609**	**77.1609**	**1.4900e-003**	**3.9500e-003**	**78.3760**

AVEK - Transmission Facility - Antelope Valley APCD Air District, Annual

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

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0350	0.6046	1.1518	1.9400e-003		3.1800e-003	3.1800e-003		3.1800e-003	3.1800e-003	0.0000	170.4269	170.4269	0.0551	0.0000	171.8048
Total	**0.0350**	**0.6046**	**1.1518**	**1.9400e-003**		**3.1800e-003**	**3.1800e-003**		**3.1800e-003**	**3.1800e-003**	**0.0000**	**170.4269**	**170.4269**	**0.0551**	**0.0000**	**171.8048**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.5000e-004	0.0330	6.4900e-003	1.6000e-004	6.0100e-003	3.9000e-004	6.4000e-003	1.7300e-003	3.7000e-004	2.1000e-003	0.0000	15.6435	15.6435	9.0000e-005	2.2500e-003	16.3172
Worker	0.0192	0.0220	0.2702	6.7000e-004	0.0738	4.5000e-004	0.0742	0.0196	4.2000e-004	0.0200	0.0000	61.5174	61.5174	1.4000e-003	1.7000e-003	62.0588
Total	**0.0202**	**0.0550**	**0.2767**	**8.3000e-004**	**0.0798**	**8.4000e-004**	**0.0806**	**0.0213**	**7.9000e-004**	**0.0221**	**0.0000**	**77.1609**	**77.1609**	**1.4900e-003**	**3.9500e-003**	**78.3760**

3.3 Site Preparation - 2023

Unmitigated Construction On-Site

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AVEK - Transmission Facility - Antelope Valley APCD Air District, Annual

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	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1398	1.2235	1.2974	3.4400e-003		0.0505	0.0505		0.0464	0.0464	0.0000	302.2628	302.2628	0.0978	0.0000	304.7067
Total	**0.1398**	**1.2235**	**1.2974**	**3.4400e-003**		**0.0505**	**0.0505**		**0.0464**	**0.0464**	**0.0000**	**302.2628**	**302.2628**	**0.0978**	**0.0000**	**304.7067**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.2000e-004	0.0455	8.3200e-003	2.8000e-004	0.0107	2.8000e-004	0.0109	3.0700e-003	2.7000e-004	3.3400e-003	0.0000	26.6350	26.6350	1.1000e-004	3.8200e-003	27.7751
Worker	0.0315	0.0343	0.4357	1.1400e-003	0.1307	7.6000e-004	0.1315	0.0347	7.0000e-004	0.0354	0.0000	106.2671	106.2671	2.1900e-003	2.7500e-003	107.1404
Total	**0.0322**	**0.0798**	**0.4440**	**1.4200e-003**	**0.1414**	**1.0400e-003**	**0.1424**	**0.0378**	**9.7000e-004**	**0.0388**	**0.0000**	**132.9021**	**132.9021**	**2.3000e-003**	**6.5700e-003**	**134.9155**

Mitigated Construction On-Site

Date: 9/15/2021 10:08 AM

AVEK - Transmission Facility - Antelope Valley APCD Air District, Annual

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	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0621	1.0718	2.0419	3.4400e-003		5.6300e-003	5.6300e-003		5.6300e-003	5.6300e-003	0.0000	302.2624	302.2624	0.0978	0.0000	304.7063
Total	**0.0621**	**1.0718**	**2.0419**	**3.4400e-003**		**5.6300e-003**	**5.6300e-003**		**5.6300e-003**	**5.6300e-003**	**0.0000**	**302.2624**	**302.2624**	**0.0978**	**0.0000**	**304.7063**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.2000e-004	0.0455	8.3200e-003	2.8000e-004	0.0107	2.8000e-004	0.0109	3.0700e-003	2.7000e-004	3.3400e-003	0.0000	26.6350	26.6350	1.1000e-004	3.8200e-003	27.7751
Worker	0.0315	0.0343	0.4357	1.1400e-003	0.1307	7.6000e-004	0.1315	0.0347	7.0000e-004	0.0354	0.0000	106.2671	106.2671	2.1900e-003	2.7500e-003	107.1404
Total	**0.0322**	**0.0798**	**0.4440**	**1.4200e-003**	**0.1414**	**1.0400e-003**	**0.1424**	**0.0378**	**9.7000e-004**	**0.0388**	**0.0000**	**132.9021**	**132.9021**	**2.3000e-003**	**6.5700e-003**	**134.9155**

Appendix C

CalEEMod Outputs – Activity 4

AVEK - Recharge Facility - Antelope Valley APCD Air District, Summer

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

AVEK - Recharge Facility

Antelope Valley APCD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	890.00	Acre	890.00	38,768,400.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Proposed Recharge Basin, Grading, Above-ground Pipeline Install [Recharge Facility, Table 2.4-3]

Land Use - Per AVEK AECOM AQ technical memo, 890 acres for this phase

Construction Phase - Per project schedule, estimated construction is from December 2021 through April 2024.

Off-road Equipment - Per project description -
2 backhoes (108 hp, 5 hours per day)
2 graders (174 hp, 6 hours per day)
2 off-highway truck (479 hp, 4 hours per day)
2 water trucks (200 hp, 4 hours per day)
6 belly scrapers (313 hp, 6 hours per day)
2 wheeled loaders (165 hp, 6 hours per day)
2 skip loaders (88 hp, 3 hours per day)
Grading - Excess spoil from excavation operations will incorporated into the recharge basin berms and thus will not be hauled off site.

Trips and VMT - Per the project description, 60 worker trips per day at 60 miles in length.

Construction Off-road Equipment Mitigation - Per AVEK AECOM 2017 technical memorandum, AQ-1 mitigation measure applied.

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AVEK - Recharge Facility - Antelope Valley APCD Air District, Summer

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

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstructionPhase	NumDays	1,395.00	630.00
tblConstructionPhase	PhaseEndDate	4/6/2027	4/30/2024
tblGrading	AcresOfGrading	3,307.50	890.00
tblOffRoadEquipment	HorsePower	187.00	174.00
tblOffRoadEquipment	HorsePower	367.00	313.00
tblOffRoadEquipment	HorsePower	97.00	108.00
tblOffRoadEquipment	HorsePower	97.00	165.00
tblOffRoadEquipment	HorsePower	402.00	479.00
tblOffRoadEquipment	HorsePower	402.00	200.00
tblOffRoadEquipment	HorsePower	65.00	88.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	WorkerTripLength	16.80	60.00

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AVEK - Recharge Facility - Antelope Valley APCD Air District, Summer

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

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	6.8913	66.9089	59.2314	0.1245	3.5498	2.8260	6.3759	0.7057	2.5999	3.3057	0.0000	12,143.5460	12,143.5460	3.3083	0.0522	12,241.7962
2022	6.0856	55.7024	55.3015	0.1240	3.5498	2.3488	5.8986	0.7057	2.1609	2.8666	0.0000	12,098.7495	12,098.7495	3.3054	0.0473	12,195.4922
2023	5.7333	50.6318	53.3840	0.1234	3.5498	2.1185	5.6683	0.7057	1.9490	2.6547	0.0000	12,048.7645	12,048.7645	3.3008	0.0432	12,144.1512
2024	5.5004	46.8537	51.7779	0.1228	3.5498	1.9575	5.5074	0.7057	1.8009	2.5066	0.0000	12,009.2183	12,009.2183	3.2951	0.0395	12,103.3765
Maximum	**6.8913**	**66.9089**	**59.2314**	**0.1245**	**3.5498**	**2.8260**	**6.3759**	**0.7057**	**2.5999**	**3.3057**	**0.0000**	**12,143.5460**	**12,143.5460**	**3.3083**	**0.0522**	**12,241.7962**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	2.2925	32.2027	70.6268	0.1245	3.5498	0.1835	3.7334	0.7057	0.1825	0.8882	0.0000	12,143.5460	12,143.5460	3.3083	0.0522	12,241.7962
2022	2.2428	32.1259	69.6736	0.1240	3.5498	0.1827	3.7326	0.7057	0.1817	0.8874	0.0000	12,098.7495	12,098.7495	3.3054	0.0473	12,195.4922
2023	2.1985	32.0604	68.8579	0.1234	3.5498	0.1820	3.7319	0.7057	0.1811	0.8868	0.0000	12,048.7645	12,048.7645	3.3008	0.0432	12,144.1512

AVEK - Recharge Facility - Antelope Valley APCD Air District, Summer

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

2024	2.1582	32.0046	67.9786	0.1228	3.5498	0.1813	3.7312	0.7057	0.1805	0.8862	0.0000	12,009.2183	12,009.2183	3.2951	0.0395	12,103.3765
Maximum	**2.2925**	**32.2027**	**70.6268**	**0.1245**	**3.5498**	**0.1835**	**3.7334**	**0.7057**	**0.1825**	**0.8882**	**0.0000**	**12,143.5460**	**12,143.5460**	**3.3083**	**0.0522**	**12,241.7962**

	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	**63.27**	**41.66**	**-26.15**	**0.00**	**0.00**	**92.11**	**36.34**	**0.00**	**91.47**	**68.69**	**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	Grading	Grading	12/1/2021	4/30/2024	5	630	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 890

Acres of Paving: 890

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
Grading	Graders	2	6.00	174	0.41
Grading	Off-Highway Trucks	2	4.00	479	0.38
Grading	Off-Highway Trucks	2	4.00	200	0.38
Grading	Scrapers	6	6.00	313	0.48
Grading	Skid Steer Loaders	2	3.00	88	0.37
Grading	Tractors/Loaders/Backhoes	2	5.00	108	0.37

AVEK - Recharge Facility - Antelope Valley APCD Air District, Summer

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

Grading	Tractors/Loaders/Backhoes	2	6.00	165	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	18	45.00	0.00	0.00	60.00	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.4982	0.0000	1.4982	0.1618	0.0000	0.1618			0.0000			0.0000
Off-Road	6.2713	66.2958	49.2511	0.1040		2.8128	2.8128		2.5878	2.5878		10,067.6353	10,067.6353	3.2561		10,149.0372
Total	**6.2713**	**66.2958**	**49.2511**	**0.1040**	**1.4982**	**2.8128**	**4.3110**	**0.1618**	**2.5878**	**2.7496**		**10,067.6353**	**10,067.6353**	**3.2561**		**10,149.0372**

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

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AVEK - Recharge Facility - Antelope Valley APCD Air District, Summer

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

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	0.6200	0.6131	9.9804	0.0205	2.0517	0.0132	2.0649	0.5439	0.0122	0.5561		2,075.9108	2,075.9108	0.0522	0.0522	2,092.7591
Total	**0.6200**	**0.6131**	**9.9804**	**0.0205**	**2.0517**	**0.0132**	**2.0649**	**0.5439**	**0.0122**	**0.5561**		**2,075.9108**	**2,075.9108**	**0.0522**	**0.0522**	**2,092.7591**

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					1.4982	0.0000	1.4982	0.1618	0.0000	0.1618			0.0000			0.0000
Off-Road	1.6724	31.5896	60.6464	0.1040		0.1703	0.1703		0.1703	0.1703	0.0000	10,067.6352	10,067.6352	3.2561		10,149.0372
Total	**1.6724**	**31.5896**	**60.6464**	**0.1040**	**1.4982**	**0.1703**	**1.6685**	**0.1618**	**0.1703**	**0.3321**	**0.0000**	**10,067.6352**	**10,067.6352**	**3.2561**		**10,149.0372**

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					

AVEK - Recharge Facility - Antelope Valley APCD Air District, Summer

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

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	0.6200	0.6131	9.9804	0.0205	2.0517	0.0132	2.0649	0.5439	0.0122	0.5561		2,075.9108	2,075.9108	0.0522	0.0522	2,092.7591
Total	**0.6200**	**0.6131**	**9.9804**	**0.0205**	**2.0517**	**0.0132**	**2.0649**	**0.5439**	**0.0122**	**0.5561**		**2,075.9108**	**2,075.9108**	**0.0522**	**0.0522**	**2,092.7591**

3.2 Grading - 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					1.4982	0.0000	1.4982	0.1618	0.0000	0.1618			0.0000			0.0000
Off-Road	5.5152	55.1661	46.2743	0.1041		2.3364	2.3364		2.1495	2.1495		10,077.7319	10,077.7319	3.2593		10,159.2155
Total	**5.5152**	**55.1661**	**46.2743**	**0.1041**	**1.4982**	**2.3364**	**3.8346**	**0.1618**	**2.1495**	**2.3113**		**10,077.7319**	**10,077.7319**	**3.2593**		**10,159.2155**

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

AVEK - Recharge Facility - Antelope Valley APCD Air District, Summer

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

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	0.5704	0.5363	9.0272	0.0199	2.0517	0.0124	2.0641	0.5439	0.0114	0.5554		2,021.0176	2,021.0176	0.0460	0.0473	2,036.2767
Total	**0.5704**	**0.5363**	**9.0272**	**0.0199**	**2.0517**	**0.0124**	**2.0641**	**0.5439**	**0.0114**	**0.5554**		**2,021.0176**	**2,021.0176**	**0.0460**	**0.0473**	**2,036.2767**

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					1.4982	0.0000	1.4982	0.1618	0.0000	0.1618			0.0000			0.0000
Off-Road	1.6724	31.5896	60.6464	0.1041		0.1703	0.1703		0.1703	0.1703	0.0000	10,077.7319	10,077.7319	3.2593		10,159.2154
Total	**1.6724**	**31.5896**	**60.6464**	**0.1041**	**1.4982**	**0.1703**	**1.6685**	**0.1618**	**0.1703**	**0.3321**	**0.0000**	**10,077.7319**	**10,077.7319**	**3.2593**		**10,159.2154**

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

AVEK - Recharge Facility - Antelope Valley APCD Air District, Summer

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

Worker	0.5704	0.5363	9.0272	0.0199	2.0517	0.0124	2.0641	0.5439	0.0114	0.5554		2,021.0176	2,021.0176	0.0460	0.0473	2,036.2767
Total	**0.5704**	**0.5363**	**9.0272**	**0.0199**	**2.0517**	**0.0124**	**2.0641**	**0.5439**	**0.0114**	**0.5554**		**2,021.0176**	**2,021.0176**	**0.0460**	**0.0473**	**2,036.2767**

3.2 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					
Fugitive Dust					1.4982	0.0000	1.4982	0.1618	0.0000	0.1618			0.0000			0.0000
Off-Road	5.2072	50.1610	45.1725	0.1041		2.1068	2.1068		1.9382	1.9382		10,079.9676	10,079.9676	3.2601		10,161.4693
Total	**5.2072**	**50.1610**	**45.1725**	**0.1041**	**1.4982**	**2.1068**	**3.6049**	**0.1618**	**1.9382**	**2.1000**		**10,079.9676**	**10,079.9676**	**3.2601**		**10,161.4693**

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	0.5261	0.4709	8.2115	0.0192	2.0517	0.0117	2.0634	0.5439	0.0108	0.5547		1,968.7969	1,968.7969	0.0407	0.0432	1,982.6820

AVEK - Recharge Facility - Antelope Valley APCD Air District, Summer

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

Total	**0.5261**	**0.4709**	**8.2115**	**0.0192**	**2.0517**	**0.0117**	**2.0634**	**0.5439**	**0.0108**	**0.5547**		**1,968.7969**	**1,968.7969**	**0.0407**	**0.0432**	**1,982.6820**

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					1.4982	0.0000	1.4982	0.1618	0.0000	0.1618			0.0000			0.0000
Off-Road	1.6724	31.5896	60.6464	0.1041		0.1703	0.1703		0.1703	0.1703	0.0000	10,079.9676	10,079.9676	3.2601		10,161.4692
Total	**1.6724**	**31.5896**	**60.6464**	**0.1041**	**1.4982**	**0.1703**	**1.6685**	**0.1618**	**0.1703**	**0.3321**	**0.0000**	**10,079.9676**	**10,079.9676**	**3.2601**		**10,161.4692**

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	0.5261	0.4709	8.2115	0.0192	2.0517	0.0117	2.0634	0.5439	0.0108	0.5547		1,968.7969	1,968.7969	0.0407	0.0432	1,982.6820
Total	**0.5261**	**0.4709**	**8.2115**	**0.0192**	**2.0517**	**0.0117**	**2.0634**	**0.5439**	**0.0108**	**0.5547**		**1,968.7969**	**1,968.7969**	**0.0407**	**0.0432**	**1,982.6820**

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AVEK - Recharge Facility - Antelope Valley APCD Air District, Summer

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

3.2 Grading - 2024

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					1.4982	0.0000	1.4982	0.1618	0.0000	0.1618			0.0000			0.0000
Off-Road	5.0146	46.4387	44.4457	0.1041		1.9465	1.9465		1.7908	1.7908		10,077.4650	10,077.4650	3.2593		10,158.9464
Total	**5.0146**	**46.4387**	**44.4457**	**0.1041**	**1.4982**	**1.9465**	**3.4447**	**0.1618**	**1.7908**	**1.9526**		**10,077.4650**	**10,077.4650**	**3.2593**		**10,158.9464**

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	0.4858	0.4150	7.3322	0.0187	2.0517	0.0110	2.0627	0.5439	0.0102	0.5541		1,931.7532	1,931.7532	0.0358	0.0395	1,944.4301
Total	**0.4858**	**0.4150**	**7.3322**	**0.0187**	**2.0517**	**0.0110**	**2.0627**	**0.5439**	**0.0102**	**0.5541**		**1,931.7532**	**1,931.7532**	**0.0358**	**0.0395**	**1,944.4301**

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AVEK - Recharge Facility - Antelope Valley APCD Air District, Summer

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

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					1.4982	0.0000	1.4982	0.1618	0.0000	0.1618			0.0000			0.0000
Off-Road	1.6724	31.5896	60.6464	0.1041		0.1703	0.1703		0.1703	0.1703	0.0000	10,077.4650	10,077.4650	3.2593		10,158.9464
Total	**1.6724**	**31.5896**	**60.6464**	**0.1041**	**1.4982**	**0.1703**	**1.6685**	**0.1618**	**0.1703**	**0.3321**	**0.0000**	**10,077.4650**	**10,077.4650**	**3.2593**		**10,158.9464**

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	0.4858	0.4150	7.3322	0.0187	2.0517	0.0110	2.0627	0.5439	0.0102	0.5541		1,931.7532	1,931.7532	0.0358	0.0395	1,944.4301
Total	**0.4858**	**0.4150**	**7.3322**	**0.0187**	**2.0517**	**0.0110**	**2.0627**	**0.5439**	**0.0102**	**0.5541**		**1,931.7532**	**1,931.7532**	**0.0358**	**0.0395**	**1,944.4301**

AVEK - Recharge Facility - Antelope Valley APCD Air District, Winter

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

AVEK - Recharge Facility

Antelope Valley APCD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	890.00	Acre	890.00	38,768,400.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Proposed Recharge Basin, Grading, Above-ground Pipeline Install [Recharge Facility, Table 2.4-3]

Land Use - Per AVEK AECOM AQ technical memo, 890 acres for this phase

Construction Phase - Per project schedule, estimated construction is from December 2021 through April 2024.

Off-road Equipment - Per project description -
2 backhoes (108 hp, 5 hours per day)
2 graders (174 hp, 6 hours per day)
2 off-highway truck (479 hp, 4 hours per day)
2 water trucks (200 hp, 4 hours per day)
6 belly scrapers (313 hp, 6 hours per day)
2 wheeled loaders (165 hp, 6 hours per day)
2 skip loaders (88 hp, 3 hours per day)

Grading - Excess spoil from excavation operations will incorporated into the recharge basin berms and thus will not be hauled off site.

Trips and VMT - Per the project description, 60 worker trips per day at 60 miles in length.

Construction Off-road Equipment Mitigation - Per AVEK AECOM 2017 technical memorandum, AQ-1 mitigation measure applied.

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AVEK - Recharge Facility - Antelope Valley APCD Air District, Winter

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

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstructionPhase	NumDays	1,395.00	630.00
tblConstructionPhase	PhaseEndDate	4/6/2027	4/30/2024
tblGrading	AcresOfGrading	3,307.50	890.00
tblOffRoadEquipment	HorsePower	187.00	174.00
tblOffRoadEquipment	HorsePower	367.00	313.00
tblOffRoadEquipment	HorsePower	97.00	108.00
tblOffRoadEquipment	HorsePower	97.00	165.00
tblOffRoadEquipment	HorsePower	402.00	479.00
tblOffRoadEquipment	HorsePower	402.00	200.00
tblOffRoadEquipment	HorsePower	65.00	88.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	WorkerTripLength	16.80	60.00

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AVEK - Recharge Facility - Antelope Valley APCD Air District, Winter

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

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	6.8874	66.9423	56.8307	0.1222	3.5498	2.8260	6.3759	0.7057	2.5999	3.3057	0.0000	11,913.7782	11,913.7782	3.3023	0.0538	12,012.3802
2022	6.0849	55.7315	53.1299	0.1218	3.5498	2.3488	5.8986	0.7057	2.1609	2.8666	0.0000	11,875.8321	11,875.8321	3.3002	0.0489	11,972.8940
2023	5.7354	50.6573	51.4083	0.1212	3.5498	2.1185	5.6683	0.7057	1.9490	2.6547	0.0000	11,832.2992	11,832.2992	3.2962	0.0445	11,927.9772
2024	5.5051	46.8761	50.0202	0.1208	3.5498	1.9575	5.5074	0.7057	1.8009	2.5066	0.0000	11,797.5900	11,797.5900	3.2912	0.0408	11,892.0204
Maximum	**6.8874**	**66.9423**	**56.8307**	**0.1222**	**3.5498**	**2.8260**	**6.3759**	**0.7057**	**2.5999**	**3.3057**	**0.0000**	**11,913.7782**	**11,913.7782**	**3.3023**	**0.0538**	**12,012.3802**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	2.2885	32.2361	68.2261	0.1222	3.5498	0.1835	3.7334	0.7057	0.1825	0.8882	0.0000	11,913.7782	11,913.7782	3.3023	0.0538	12,012.3802
2022	2.2421	32.1550	67.5021	0.1218	3.5498	0.1827	3.7326	0.7057	0.1817	0.8874	0.0000	11,875.8321	11,875.8321	3.3002	0.0489	11,972.8940
2023	2.2006	32.0859	66.8822	0.1212	3.5498	0.1820	3.7319	0.7057	0.1811	0.8868	0.0000	11,832.2992	11,832.2992	3.2962	0.0445	11,927.9772

AVEK - Recharge Facility - Antelope Valley APCD Air District, Winter

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

2024	2.1629	32.0270	66.2209	0.1208	3.5498	0.1813	3.7312	0.7057	0.1805	0.8862	0.0000	11,797.5900	11,797.5900	3.2912	0.0408	11,892.0204
Maximum	**2.2885**	**32.2361**	**68.2261**	**0.1222**	**3.5498**	**0.1835**	**3.7334**	**0.7057**	**0.1825**	**0.8882**	**0.0000**	**11,913.7782**	**11,913.7782**	**3.3023**	**0.0538**	**12,012.3802**

	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	**63.27**	**41.64**	**-27.17**	**0.00**	**0.00**	**92.11**	**36.34**	**0.00**	**91.47**	**68.69**	**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	Grading	Grading	12/1/2021	4/30/2024	5	630	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 890

Acres of Paving: 890

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
Grading	Graders	2	6.00	174	0.41
Grading	Off-Highway Trucks	2	4.00	479	0.38
Grading	Off-Highway Trucks	2	4.00	200	0.38
Grading	Scrapers	6	6.00	313	0.48
Grading	Skid Steer Loaders	2	3.00	88	0.37
Grading	Tractors/Loaders/Backhoes	2	5.00	108	0.37

AVEK - Recharge Facility - Antelope Valley APCD Air District, Winter

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

Grading	Tractors/Loaders/Backhoes	2	6.00	165	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	18	45.00	0.00	0.00	60.00	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.4982	0.0000	1.4982	0.1618	0.0000	0.1618			0.0000			0.0000
Off-Road	6.2713	66.2958	49.2511	0.1040		2.8128	2.8128		2.5878	2.5878		10,067.6353	10,067.6353	3.2561		10,149.0372
Total	**6.2713**	**66.2958**	**49.2511**	**0.1040**	**1.4982**	**2.8128**	**4.3110**	**0.1618**	**2.5878**	**2.7496**		**10,067.6353**	**10,067.6353**	**3.2561**		**10,149.0372**

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

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AVEK - Recharge Facility - Antelope Valley APCD Air District, Winter

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

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	0.6161	0.6465	7.5796	0.0182	2.0517	0.0132	2.0649	0.5439	0.0122	0.5561		1,846.1429	1,846.1429	0.0462	0.0538	1,863.3430
Total	**0.6161**	**0.6465**	**7.5796**	**0.0182**	**2.0517**	**0.0132**	**2.0649**	**0.5439**	**0.0122**	**0.5561**		**1,846.1429**	**1,846.1429**	**0.0462**	**0.0538**	**1,863.3430**

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					1.4982	0.0000	1.4982	0.1618	0.0000	0.1618			0.0000			0.0000
Off-Road	1.6724	31.5896	60.6464	0.1040		0.1703	0.1703		0.1703	0.1703	0.0000	10,067.6352	10,067.6352	3.2561		10,149.0372
Total	**1.6724**	**31.5896**	**60.6464**	**0.1040**	**1.4982**	**0.1703**	**1.6685**	**0.1618**	**0.1703**	**0.3321**	**0.0000**	**10,067.6352**	**10,067.6352**	**3.2561**		**10,149.0372**

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					

AVEK - Recharge Facility - Antelope Valley APCD Air District, Winter

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

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	0.6161	0.6465	7.5796	0.0182	2.0517	0.0132	2.0649	0.5439	0.0122	0.5561		1,846.1429	1,846.1429	0.0462	0.0538	1,863.3430
Total	**0.6161**	**0.6465**	**7.5796**	**0.0182**	**2.0517**	**0.0132**	**2.0649**	**0.5439**	**0.0122**	**0.5561**		**1,846.1429**	**1,846.1429**	**0.0462**	**0.0538**	**1,863.3430**

3.2 Grading - 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					1.4982	0.0000	1.4982	0.1618	0.0000	0.1618			0.0000			0.0000
Off-Road	5.5152	55.1661	46.2743	0.1041		2.3364	2.3364		2.1495	2.1495		10,077.7319	10,077.7319	3.2593		10,159.2155
Total	**5.5152**	**55.1661**	**46.2743**	**0.1041**	**1.4982**	**2.3364**	**3.8346**	**0.1618**	**2.1495**	**2.3113**		**10,077.7319**	**10,077.7319**	**3.2593**		**10,159.2155**

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

AVEK - Recharge Facility - Antelope Valley APCD Air District, Winter

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

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	0.5697	0.5655	6.8557	0.0177	2.0517	0.0124	2.0641	0.5439	0.0114	0.5554		1,798.1002	1,798.1002	0.0408	0.0489	1,813.6786
Total	**0.5697**	**0.5655**	**6.8557**	**0.0177**	**2.0517**	**0.0124**	**2.0641**	**0.5439**	**0.0114**	**0.5554**		**1,798.1002**	**1,798.1002**	**0.0408**	**0.0489**	**1,813.6786**

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					1.4982	0.0000	1.4982	0.1618	0.0000	0.1618			0.0000			0.0000
Off-Road	1.6724	31.5896	60.6464	0.1041		0.1703	0.1703		0.1703	0.1703	0.0000	10,077.7319	10,077.7319	3.2593		10,159.2154
Total	**1.6724**	**31.5896**	**60.6464**	**0.1041**	**1.4982**	**0.1703**	**1.6685**	**0.1618**	**0.1703**	**0.3321**	**0.0000**	**10,077.7319**	**10,077.7319**	**3.2593**		**10,159.2154**

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

AVEK - Recharge Facility - Antelope Valley APCD Air District, Winter

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

Worker	0.5697	0.5655	6.8557	0.0177	2.0517	0.0124	2.0641	0.5439	0.0114	0.5554		1,798.1002	1,798.1002	0.0408	0.0489	1,813.6786
Total	**0.5697**	**0.5655**	**6.8557**	**0.0177**	**2.0517**	**0.0124**	**2.0641**	**0.5439**	**0.0114**	**0.5554**		**1,798.1002**	**1,798.1002**	**0.0408**	**0.0489**	**1,813.6786**

3.2 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					
Fugitive Dust					1.4982	0.0000	1.4982	0.1618	0.0000	0.1618			0.0000			0.0000
Off-Road	5.2072	50.1610	45.1725	0.1041		2.1068	2.1068		1.9382	1.9382		10,079.9676	10,079.9676	3.2601		10,161.4693
Total	**5.2072**	**50.1610**	**45.1725**	**0.1041**	**1.4982**	**2.1068**	**3.6049**	**0.1618**	**1.9382**	**2.1000**		**10,079.9676**	**10,079.9676**	**3.2601**		**10,161.4693**

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	0.5282	0.4963	6.2358	0.0171	2.0517	0.0117	2.0634	0.5439	0.0108	0.5547		1,752.3316	1,752.3316	0.0361	0.0445	1,766.5079

AVEK - Recharge Facility - Antelope Valley APCD Air District, Winter

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

Total	**0.5282**	**0.4963**	**6.2358**	**0.0171**	**2.0517**	**0.0117**	**2.0634**	**0.5439**	**0.0108**	**0.5547**		**1,752.3316**	**1,752.3316**	**0.0361**	**0.0445**	**1,766.5079**

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					1.4982	0.0000	1.4982	0.1618	0.0000	0.1618			0.0000			0.0000
Off-Road	1.6724	31.5896	60.6464	0.1041		0.1703	0.1703		0.1703	0.1703	0.0000	10,079.9676	10,079.9676	3.2601		10,161.4692
Total	**1.6724**	**31.5896**	**60.6464**	**0.1041**	**1.4982**	**0.1703**	**1.6685**	**0.1618**	**0.1703**	**0.3321**	**0.0000**	**10,079.9676**	**10,079.9676**	**3.2601**		**10,161.4692**

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	0.5282	0.4963	6.2358	0.0171	2.0517	0.0117	2.0634	0.5439	0.0108	0.5547		1,752.3316	1,752.3316	0.0361	0.0445	1,766.5079
Total	**0.5282**	**0.4963**	**6.2358**	**0.0171**	**2.0517**	**0.0117**	**2.0634**	**0.5439**	**0.0108**	**0.5547**		**1,752.3316**	**1,752.3316**	**0.0361**	**0.0445**	**1,766.5079**

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AVEK - Recharge Facility - Antelope Valley APCD Air District, Winter

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

3.2 Grading - 2024

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					1.4982	0.0000	1.4982	0.1618	0.0000	0.1618			0.0000			0.0000
Off-Road	5.0146	46.4387	44.4457	0.1041		1.9465	1.9465		1.7908	1.7908		10,077.4650	10,077.4650	3.2593		10,158.9464
Total	**5.0146**	**46.4387**	**44.4457**	**0.1041**	**1.4982**	**1.9465**	**3.4447**	**0.1618**	**1.7908**	**1.9526**		**10,077.4650**	**10,077.4650**	**3.2593**		**10,158.9464**

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	0.4905	0.4375	5.5745	0.0167	2.0517	0.0110	2.0627	0.5439	0.0102	0.5541		1,720.1250	1,720.1250	0.0319	0.0408	1,733.0739
Total	**0.4905**	**0.4375**	**5.5745**	**0.0167**	**2.0517**	**0.0110**	**2.0627**	**0.5439**	**0.0102**	**0.5541**		**1,720.1250**	**1,720.1250**	**0.0319**	**0.0408**	**1,733.0739**

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AVEK - Recharge Facility - Antelope Valley APCD Air District, Winter

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

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					1.4982	0.0000	1.4982	0.1618	0.0000	0.1618			0.0000			0.0000
Off-Road	1.6724	31.5896	60.6464	0.1041		0.1703	0.1703		0.1703	0.1703	0.0000	10,077.4650	10,077.4650	3.2593		10,158.9464
Total	**1.6724**	**31.5896**	**60.6464**	**0.1041**	**1.4982**	**0.1703**	**1.6685**	**0.1618**	**0.1703**	**0.3321**	**0.0000**	**10,077.4650**	**10,077.4650**	**3.2593**		**10,158.9464**

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	0.4905	0.4375	5.5745	0.0167	2.0517	0.0110	2.0627	0.5439	0.0102	0.5541		1,720.1250	1,720.1250	0.0319	0.0408	1,733.0739
Total	**0.4905**	**0.4375**	**5.5745**	**0.0167**	**2.0517**	**0.0110**	**2.0627**	**0.5439**	**0.0102**	**0.5541**		**1,720.1250**	**1,720.1250**	**0.0319**	**0.0408**	**1,733.0739**

AVEK - Recharge Facility - Antelope Valley APCD Air District, Annual

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

AVEK - Recharge Facility

Antelope Valley APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	890.00	Acre	890.00	38,768,400.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Proposed Recharge Basin, Grading, Above-ground Pipeline Install [Recharge Facility, Table 2.4-3]

Land Use - Per AVEK AECOM AQ technical memo, 890 acres for this phase

Construction Phase - Per project schedule, estimated construction is from December 2021 through April 2024.

Off-road Equipment - Per project description -
2 backhoes (108 hp, 5 hours per day)
2 graders (174 hp, 6 hours per day)
2 off-highway truck (479 hp, 4 hours per day)
2 water trucks (200 hp, 4 hours per day)
6 belly scrapers (313 hp, 6 hours per day)
2 wheeled loaders (165 hp, 6 hours per day)
2 skip loaders (88 hp, 3 hours per day)
Grading - Excess spoil from excavation operations will incorporated into the recharge basin berms and thus will not be hauled off site.

Trips and VMT - Per the project description, 60 worker trips per day at 60 miles in length.

Construction Off-road Equipment Mitigation - Per AVEK AECOM 2017 technical memorandum, AQ-1 mitigation measure applied.

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

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstructionPhase	NumDays	1,395.00	630.00
tblConstructionPhase	PhaseEndDate	4/6/2027	4/30/2024
tblGrading	AcresOfGrading	3,307.50	890.00
tblOffRoadEquipment	HorsePower	187.00	174.00
tblOffRoadEquipment	HorsePower	367.00	313.00
tblOffRoadEquipment	HorsePower	97.00	108.00
tblOffRoadEquipment	HorsePower	97.00	165.00
tblOffRoadEquipment	HorsePower	402.00	479.00
tblOffRoadEquipment	HorsePower	402.00	200.00
tblOffRoadEquipment	HorsePower	65.00	88.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	WorkerTripLength	16.80	60.00

AVEK - Recharge Facility - Antelope Valley APCD Air District, Annual

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

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0787	0.7703	0.6601	1.4100e-003	0.4951	0.0325	0.5276	0.0571	0.0299	0.0870	0.0000	124.8436	124.8436	0.0345	5.9000e-004	125.8803
2022	0.7850	7.2497	6.9736	0.0159	0.7334	0.3053	1.0387	0.1204	0.2809	0.4013	0.0000	1,406.6146	1,406.6146	0.3893	6.0300e-003	1,418.1437
2023	0.7399	6.5895	6.7438	0.0158	0.7334	0.2754	1.0088	0.1204	0.2534	0.3738	0.0000	1,401.3054	1,401.3054	0.3889	5.4900e-003	1,412.6637
2024	0.2376	2.0403	2.1940	5.2700e-003	0.5594	0.0852	0.6446	0.0742	0.0783	0.1525	0.0000	467.4841	467.4841	0.1299	1.6800e-003	471.2333
Maximum	**0.7850**	**7.2497**	**6.9736**	**0.0159**	**0.7334**	**0.3053**	**1.0387**	**0.1204**	**0.2809**	**0.4013**	**0.0000**	**1,406.6146**	**1,406.6146**	**0.3893**	**6.0300e-003**	**1,418.1437**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0258	0.3712	0.7911	1.4100e-003	0.4951	2.1100e-003	0.4972	0.0571	2.1000e-003	0.0592	0.0000	124.8435	124.8435	0.0345	5.9000e-004	125.8802
2022	0.2855	4.1848	8.8420	0.0159	0.7334	0.0238	0.7572	0.1204	0.0236	0.1440	0.0000	1,406.6132	1,406.6132	0.3893	6.0300e-003	1,418.1422
2023	0.2803	4.1752	8.7554	0.0158	0.7334	0.0237	0.7571	0.1204	0.0235	0.1439	0.0000	1,401.3039	1,401.3039	0.3889	5.4900e-003	1,412.6623

AVEK - Recharge Facility - Antelope Valley APCD Air District, Annual

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

2024	0.0922	1.3944	2.8987	5.2700e-003	0.5594	7.8900e-003	0.5673	0.0742	7.8500e-003	0.0820	0.0000	467.4836	467.4836	0.1299	1.6800e-003	471.2328
Maximum	**0.2855**	**4.1848**	**8.8420**	**0.0159**	**0.7334**	**0.0238**	**0.7572**	**0.1204**	**0.0236**	**0.1440**	**0.0000**	**1,406.6132**	**1,406.6132**	**0.3893**	**6.0300e-003**	**1,418.1422**

	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	**62.86**	**39.19**	**-28.46**	**0.00**	**0.00**	**91.78**	**19.91**	**0.00**	**91.11**	**57.70**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**12-1-2021**	**2-28-2022**	2.1200	1.1070
2	**3-1-2022**	**5-31-2022**	2.0305	1.1296
3	**6-1-2022**	**8-31-2022**	2.0302	1.1293
4	**9-1-2022**	**11-30-2022**	2.0087	1.1176
5	**12-1-2022**	**2-28-2023**	1.8727	1.1033
6	**3-1-2023**	**5-31-2023**	1.8523	1.1260
7	**6-1-2023**	**8-31-2023**	1.8520	1.1257
8	**9-1-2023**	**11-30-2023**	1.8325	1.1140
9	**12-1-2023**	**2-29-2024**	1.7468	1.1122
10	**3-1-2024**	**5-31-2024**	1.1409	0.7446
		Highest	2.1200	1.1296

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	12/1/2021	4/30/2024	5	630	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 890

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Acres of Paving: 890

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
Grading	Graders	2	6.00	174	0.41
Grading	Off-Highway Trucks	2	4.00	479	0.38
Grading	Off-Highway Trucks	2	4.00	200	0.38
Grading	Scrapers	6	6.00	313	0.48
Grading	Skid Steer Loaders	2	3.00	88	0.37
Grading	Tractors/Loaders/Backhoes	2	5.00	108	0.37
Grading	Tractors/Loaders/Backhoes	2	6.00	165	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	18	45.00	0.00	0.00	60.00	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

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

Fugitive Dust					0.4719	0.0000	0.4719	0.0510	0.0000	0.0510	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0721	0.7624	0.5664	1.2000e-003		0.0324	0.0324		0.0298	0.0298	0.0000	105.0319	105.0319	0.0340	0.0000	105.8811
Total	**0.0721**	**0.7624**	**0.5664**	**1.2000e-003**	**0.4719**	**0.0324**	**0.5043**	**0.0510**	**0.0298**	**0.0807**	**0.0000**	**105.0319**	**105.0319**	**0.0340**	**0.0000**	**105.8811**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.5300e-003	7.9000e-003	0.0937	2.2000e-004	0.0231	1.5000e-004	0.0233	6.1400e-003	1.4000e-004	6.2800e-003	0.0000	19.8118	19.8118	5.0000e-004	5.9000e-004	19.9992
Total	**6.5300e-003**	**7.9000e-003**	**0.0937**	**2.2000e-004**	**0.0231**	**1.5000e-004**	**0.0233**	**6.1400e-003**	**1.4000e-004**	**6.2800e-003**	**0.0000**	**19.8118**	**19.8118**	**5.0000e-004**	**5.9000e-004**	**19.9992**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4719	0.0000	0.4719	0.0510	0.0000	0.0510	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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

Off-Road	0.0192	0.3633	0.6974	1.2000e-003		1.9600e-003	1.9600e-003		1.9600e-003	1.9600e-003	0.0000	105.0317	105.0317	0.0340	0.0000	105.8810
Total	**0.0192**	**0.3633**	**0.6974**	**1.2000e-003**	**0.4719**	**1.9600e-003**	**0.4739**	**0.0510**	**1.9600e-003**	**0.0529**	**0.0000**	**105.0317**	**105.0317**	**0.0340**	**0.0000**	**105.8810**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.5300e-003	7.9000e-003	0.0937	2.2000e-004	0.0231	1.5000e-004	0.0233	6.1400e-003	1.4000e-004	6.2800e-003	0.0000	19.8118	19.8118	5.0000e-004	5.9000e-004	19.9992
Total	**6.5300e-003**	**7.9000e-003**	**0.0937**	**2.2000e-004**	**0.0231**	**1.5000e-004**	**0.0233**	**6.1400e-003**	**1.4000e-004**	**6.2800e-003**	**0.0000**	**19.8118**	**19.8118**	**5.0000e-004**	**5.9000e-004**	**19.9992**

3.2 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4719	0.0000	0.4719	0.0510	0.0000	0.0510	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.7170	7.1716	6.0157	0.0135		0.3037	0.3037		0.2794	0.2794	0.0000	1,188.5074	1,188.5074	0.3844	0.0000	1,198.1171

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

Total	**0.7170**	**7.1716**	**6.0157**	**0.0135**	**0.4719**	**0.3037**	**0.7757**	**0.0510**	**0.2794**	**0.3304**	**0.0000**	**1,188.5074**	**1,188.5074**	**0.3844**	**0.0000**	**1,198.1171**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0681	0.0782	0.9580	2.3600e-003	0.2615	1.6100e-003	0.2631	0.0694	1.4800e-003	0.0709	0.0000	218.1072	218.1072	4.9500e-003	6.0300e-003	220.0266
Total	**0.0681**	**0.0782**	**0.9580**	**2.3600e-003**	**0.2615**	**1.6100e-003**	**0.2631**	**0.0694**	**1.4800e-003**	**0.0709**	**0.0000**	**218.1072**	**218.1072**	**4.9500e-003**	**6.0300e-003**	**220.0266**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4719	0.0000	0.4719	0.0510	0.0000	0.0510	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2174	4.1066	7.8840	0.0135		0.0221	0.0221		0.0221	0.0221	0.0000	1,188.5060	1,188.5060	0.3844	0.0000	1,198.1157
Total	**0.2174**	**4.1066**	**7.8840**	**0.0135**	**0.4719**	**0.0221**	**0.4941**	**0.0510**	**0.0221**	**0.0731**	**0.0000**	**1,188.5060**	**1,188.5060**	**0.3844**	**0.0000**	**1,198.1157**

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

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0681	0.0782	0.9580	2.3600e-003	0.2615	1.6100e-003	0.2631	0.0694	1.4800e-003	0.0709	0.0000	218.1072	218.1072	4.9500e-003	6.0300e-003	220.0266
Total	**0.0681**	**0.0782**	**0.9580**	**2.3600e-003**	**0.2615**	**1.6100e-003**	**0.2631**	**0.0694**	**1.4800e-003**	**0.0709**	**0.0000**	**218.1072**	**218.1072**	**4.9500e-003**	**6.0300e-003**	**220.0266**

3.2 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	tons/yr										MT/yr					
Fugitive Dust					0.4719	0.0000	0.4719	0.0510	0.0000	0.0510	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.6769	6.5209	5.8724	0.0135		0.2739	0.2739		0.2520	0.2520	0.0000	1,188.7711	1,188.7711	0.3845	0.0000	1,198.3829
Total	**0.6769**	**6.5209**	**5.8724**	**0.0135**	**0.4719**	**0.2739**	**0.7458**	**0.0510**	**0.2520**	**0.3029**	**0.0000**	**1,188.7711**	**1,188.7711**	**0.3845**	**0.0000**	**1,198.3829**

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

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0629	0.0686	0.8714	2.2900e-003	0.2615	1.5200e-003	0.2630	0.0694	1.4000e-003	0.0708	0.0000	212.5343	212.5343	4.3800e-003	5.4900e-003	214.2808
Total	**0.0629**	**0.0686**	**0.8714**	**2.2900e-003**	**0.2615**	**1.5200e-003**	**0.2630**	**0.0694**	**1.4000e-003**	**0.0708**	**0.0000**	**212.5343**	**212.5343**	**4.3800e-003**	**5.4900e-003**	**214.2808**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4719	0.0000	0.4719	0.0510	0.0000	0.0510	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2174	4.1066	7.8840	0.0135		0.0221	0.0221		0.0221	0.0221	0.0000	1,188.7697	1,188.7697	0.3845	0.0000	1,198.3815
Total	**0.2174**	**4.1066**	**7.8840**	**0.0135**	**0.4719**	**0.0221**	**0.4941**	**0.0510**	**0.0221**	**0.0731**	**0.0000**	**1,188.7697**	**1,188.7697**	**0.3845**	**0.0000**	**1,198.3815**

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

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0629	0.0686	0.8714	2.2900e-003	0.2615	1.5200e-003	0.2630	0.0694	1.4000e-003	0.0708	0.0000	212.5343	212.5343	4.3800e-003	5.4900e-003	214.2808
Total	**0.0629**	**0.0686**	**0.8714**	**2.2900e-003**	**0.2615**	**1.5200e-003**	**0.2630**	**0.0694**	**1.4000e-003**	**0.0708**	**0.0000**	**212.5343**	**212.5343**	**4.3800e-003**	**5.4900e-003**	**214.2808**

3.2 Grading - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4719	0.0000	0.4719	0.0510	0.0000	0.0510	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2181	2.0201	1.9334	4.5300e-003		0.0847	0.0847		0.0779	0.0779	0.0000	397.6823	397.6823	0.1286	0.0000	400.8978
Total	**0.2181**	**2.0201**	**1.9334**	**4.5300e-003**	**0.4719**	**0.0847**	**0.5566**	**0.0510**	**0.0779**	**0.1289**	**0.0000**	**397.6823**	**397.6823**	**0.1286**	**0.0000**	**400.8978**

Unmitigated Construction Off-Site

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AVEK - Recharge Facility - Antelope Valley APCD Air District, Annual

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	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0195	0.0202	0.2606	7.5000e-004	0.0875	4.8000e-004	0.0880	0.0232	4.4000e-004	0.0237	0.0000	69.8018	69.8018	1.2900e-003	1.6800e-003	70.3355
Total	**0.0195**	**0.0202**	**0.2606**	**7.5000e-004**	**0.0875**	**4.8000e-004**	**0.0880**	**0.0232**	**4.4000e-004**	**0.0237**	**0.0000**	**69.8018**	**69.8018**	**1.2900e-003**	**1.6800e-003**	**70.3355**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4719	0.0000	0.4719	0.0510	0.0000	0.0510	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0728	1.3741	2.6381	4.5300e-003		7.4100e-003	7.4100e-003		7.4100e-003	7.4100e-003	0.0000	397.6819	397.6819	0.1286	0.0000	400.8973
Total	**0.0728**	**1.3741**	**2.6381**	**4.5300e-003**	**0.4719**	**7.4100e-003**	**0.4793**	**0.0510**	**7.4100e-003**	**0.0584**	**0.0000**	**397.6819**	**397.6819**	**0.1286**	**0.0000**	**400.8973**

Mitigated Construction Off-Site

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AVEK - Recharge Facility - Antelope Valley APCD Air District, Annual

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	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0195	0.0202	0.2606	7.5000e-004	0.0875	4.8000e-004	0.0880	0.0232	4.4000e-004	0.0237	0.0000	69.8018	69.8018	1.2900e-003	1.6800e-003	70.3355
Total	**0.0195**	**0.0202**	**0.2606**	**7.5000e-004**	**0.0875**	**4.8000e-004**	**0.0880**	**0.0232**	**4.4000e-004**	**0.0237**	**0.0000**	**69.8018**	**69.8018**	**1.2900e-003**	**1.6800e-003**	**70.3355**

Appendix D

CalEEMod Outputs – Activity 5

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

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

AVEK - Recovery Facilities

Antelope Valley APCD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	6.50	Acre	6.50	283,140.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Proposed Extraction Wells/Recovery [Recovery Facilities, Table 2.4-4]

Land Use - Per AVEK Project Description, 6.5 acres for this phase

Construction Phase - Per project schedule, estimated construction is from December 2021 through April 2024.

Off-road Equipment - Per AVEK AECOM Technical AQ Memo -
2 grader (174 hp, 6 hours per day)
2 wheeled loaders (313 hp; 1 hour per day)
1 water truck (200 hp, 1 hour per day)

Off-road Equipment - Per AVEK AECOM Technical AQ Memo -
2 hydraulic excavators (180 hp, 6 hours per day)

Off-road Equipment - Per AVEK AECOM Technical AQ Memo -
2 drilling rigs (500 HP, 24 hrs per day for 90 days)
2 off-highway trucks (479 hp, 4 hours per day)
2 Test pumps (200 hp, 60 hrs per well)
2 skip loader (88 hp, 1 hour per day)
2 small roller compactor (114 hp, 1 hour per day)

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AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

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

Construction Off-road Equipment Mitigation - Per AVEK AECOM 2017 technical memorandum, AQ-1 mitigation measure applied.

Grading - Excess spoil from excavation operations will incorporated into the recharge basin berms and thus will not be hauled off site.

Trips and VMT - Per the project description, 60 worker trips and 12 vendor trips per day at 60 miles in length.

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstructionPhase	NumDays	230.00	630.00
tblConstructionPhase	NumDays	20.00	630.00
tblConstructionPhase	PhaseEndDate	11/15/2022	4/30/2024
tblConstructionPhase	PhaseEndDate	12/28/2021	4/30/2024
tblConstructionPhase	PhaseEndDate	12/28/2021	4/30/2024
tblConstructionPhase	PhaseStartDate	12/29/2021	12/1/2021
tblConstructionPhase	PhaseStartDate	12/29/2021	12/1/2021
tblGrading	AcresOfGrading	472.50	6.50
tblOffRoadEquipment	HorsePower	402.00	479.00

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

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

tblOffRoadEquipment	HorsePower	97.00	313.00
tblOffRoadEquipment	HorsePower	158.00	180.00
tblOffRoadEquipment	HorsePower	221.00	500.00
tblOffRoadEquipment	HorsePower	402.00	479.00
tblOffRoadEquipment	HorsePower	84.00	200.00
tblOffRoadEquipment	HorsePower	65.00	88.00
tblOffRoadEquipment	HorsePower	80.00	114.00
tblOffRoadEquipment	HorsePower	187.00	174.00
tblOffRoadEquipment	LoadFactor	0.37	0.41
tblOffRoadEquipment	LoadFactor	0.37	0.37
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	OffRoadEquipmentType		Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Rollers
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripLength	6.60	60.00
tblTripsAndVMT	VendorTripLength	6.60	60.00
tblTripsAndVMT	VendorTripLength	6.60	60.00
tblTripsAndVMT	VendorTripNumber	46.00	12.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripNumber	13.00	20.00
tblTripsAndVMT	WorkerTripNumber	5.00	10.00
tblTripsAndVMT	WorkerTripNumber	119.00	30.00

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AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

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

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	9.7125	88.5488	74.3236	0.3143	3.4124	3.0332	6.4456	0.9179	2.8586	3.7765	0.0000	30,501.6912	30,501.6912	5.8140	0.3499	30,751.3124
2022	8.8407	74.7137	71.7287	0.3122	3.4124	2.5434	5.9557	0.9179	2.3979	3.3157	0.0000	30,301.7882	30,301.7882	5.7643	0.3338	30,545.3692
2023	8.2472	64.9896	69.8168	0.3098	3.4124	2.1960	5.6084	0.9179	2.0711	2.9890	0.0000	30,076.1590	30,076.1590	5.7121	0.3162	30,313.1772
2024	8.0211	59.9680	68.6020	0.3089	3.4124	2.0148	5.4271	0.9179	1.8969	2.8148	0.0000	30,000.6271	30,000.6271	5.7096	0.3049	30,234.2148
Maximum	**9.7125**	**88.5488**	**74.3236**	**0.3143**	**3.4124**	**3.0332**	**6.4456**	**0.9179**	**2.8586**	**3.7765**	**0.0000**	**30,501.6912**	**30,501.6912**	**5.8140**	**0.3499**	**30,751.3124**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	5.1007	73.4331	150.6958	0.3143	3.4124	0.5097	3.9221	0.9179	0.5048	1.4227	0.0000	30,501.6912	30,501.6912	5.8140	0.3499	30,751.3124
2022	4.9597	72.4749	149.1576	0.3122	3.4124	0.4714	3.8838	0.9179	0.4682	1.3861	0.0000	30,301.7881	30,301.7881	5.7643	0.3338	30,545.3692
2023	4.8408	71.6330	147.8737	0.3098	3.4124	0.4451	3.8575	0.9179	0.4431	1.3610	0.0000	30,076.1590	30,076.1590	5.7121	0.3162	30,313.1772

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

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

2024	4.7851	71.4855	146.6658	0.3089	3.4124	0.4457	3.8581	0.9179	0.4437	1.3616	0.0000	30,000.6271	30,000.6271	5.7096	0.3049	30,234.2147
Maximum	**5.1007**	**73.4331**	**150.6958**	**0.3143**	**3.4124**	**0.5097**	**3.9221**	**0.9179**	**0.5048**	**1.4227**	**0.0000**	**30,501.6912**	**30,501.6912**	**5.8140**	**0.3499**	**30,751.3124**

	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	**43.46**	**-0.28**	**-108.95**	**0.00**	**0.00**	**80.87**	**33.77**	**0.00**	**79.84**	**57.11**	**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	Grading	Grading	12/1/2021	4/30/2024	5	630	
2	Trenching	Trenching	12/1/2021	4/30/2024	5	630	
3	Well Construction	Building Construction	12/1/2021	4/30/2024	5	630	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 6.5

Acres of Paving: 6.5

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
Grading	Off-Highway Trucks	1	4.00	479	0.38
Grading	Tractors/Loaders/Backhoes	2	1.00	313	0.41
Trenching	Excavators	2	6.00	180	0.38
Well Construction	Bore/Drill Rigs	2	24.00	500	0.50

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

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

Well Construction	Off-Highway Trucks	2	4.00	479	0.38
Well Construction	Pumps	2	24.00	200	0.74
Well Construction	Skid Steer Loaders	2	1.00	88	0.37
Well Construction	Rollers	2	1.00	114	0.38
Grading	Graders	2	6.00	174	0.41

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
Grading	5	20.00	0.00	0.00	60.00	60.00	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	2	10.00	0.00	0.00	60.00	60.00	20.00	LD_Mix	HDT_Mix	HHDT
Well Construction	10	30.00	12.00	0.00	60.00	60.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0109	0.0000	0.0109	1.1800e-003	0.0000	1.1800e-003			0.0000			0.0000
Off-Road	1.4162	13.2744	9.6234	0.0199		0.6608	0.6608		0.6079	0.6079		1,930.4000	1,930.4000	0.6243		1,946.0083
Total	**1.4162**	**13.2744**	**9.6234**	**0.0199**	**0.0109**	**0.6608**	**0.6717**	**1.1800e-003**	**0.6079**	**0.6091**		**1,930.4000**	**1,930.4000**	**0.6243**		**1,946.0083**

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AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

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

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	0.2756	0.2725	4.4357	9.1100e-003	0.9119	5.8700e-003	0.9177	0.2418	5.4000e-003	0.2472		922.6270	922.6270	0.0232	0.0232	930.1151
Total	**0.2756**	**0.2725**	**4.4357**	**9.1100e-003**	**0.9119**	**5.8700e-003**	**0.9177**	**0.2418**	**5.4000e-003**	**0.2472**		**922.6270**	**922.6270**	**0.0232**	**0.0232**	**930.1151**

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					0.0109	0.0000	0.0109	1.1800e-003	0.0000	1.1800e-003			0.0000			0.0000
Off-Road	0.2869	6.8583	12.6277	0.0199		0.0325	0.0325		0.0325	0.0325	0.0000	1,930.4000	1,930.4000	0.6243		1,946.0083
Total	**0.2869**	**6.8583**	**12.6277**	**0.0199**	**0.0109**	**0.0325**	**0.0434**	**1.1800e-003**	**0.0325**	**0.0337**	**0.0000**	**1,930.4000**	**1,930.4000**	**0.6243**		**1,946.0083**

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

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

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	0.2756	0.2725	4.4357	9.1100e-003	0.9119	5.8700e-003	0.9177	0.2418	5.4000e-003	0.2472		922.6270	922.6270	0.0232	0.0232	930.1151
Total	**0.2756**	**0.2725**	**4.4357**	**9.1100e-003**	**0.9119**	**5.8700e-003**	**0.9177**	**0.2418**	**5.4000e-003**	**0.2472**		**922.6270**	**922.6270**	**0.0232**	**0.0232**	**930.1151**

3.2 Grading - 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					0.0109	0.0000	0.0109	1.1800e-003	0.0000	1.1800e-003			0.0000			0.0000
Off-Road	1.2366	10.9894	9.3176	0.0199		0.5497	0.5497		0.5057	0.5057		1,930.7201	1,930.7201	0.6244		1,946.3309
Total	**1.2366**	**10.9894**	**9.3176**	**0.0199**	**0.0109**	**0.5497**	**0.5606**	**1.1800e-003**	**0.5057**	**0.5069**		**1,930.7201**	**1,930.7201**	**0.6244**		**1,946.3309**

Unmitigated Construction Off-Site

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AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

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	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	0.2535	0.2384	4.0121	8.8300e-003	0.9119	5.5100e-003	0.9174	0.2418	5.0800e-003	0.2468		898.2301	898.2301	0.0205	0.0210	905.0119
Total	**0.2535**	**0.2384**	**4.0121**	**8.8300e-003**	**0.9119**	**5.5100e-003**	**0.9174**	**0.2418**	**5.0800e-003**	**0.2468**		**898.2301**	**898.2301**	**0.0205**	**0.0210**	**905.0119**

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					0.0109	0.0000	0.0109	1.1800e-003	0.0000	1.1800e-003			0.0000			0.0000
Off-Road	0.2869	6.8583	12.6277	0.0199		0.0325	0.0325		0.0325	0.0325	0.0000	1,930.7201	1,930.7201	0.6244		1,946.3309
Total	**0.2869**	**6.8583**	**12.6277**	**0.0199**	**0.0109**	**0.0325**	**0.0434**	**1.1800e-003**	**0.0325**	**0.0337**	**0.0000**	**1,930.7201**	**1,930.7201**	**0.6244**		**1,946.3309**

Mitigated Construction Off-Site

Date: 9/15/2021 11:06 AM

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

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	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	0.2535	0.2384	4.0121	8.8300e-003	0.9119	5.5100e-003	0.9174	0.2418	5.0800e-003	0.2468		898.2301	898.2301	0.0205	0.0210	905.0119
Total	**0.2535**	**0.2384**	**4.0121**	**8.8300e-003**	**0.9119**	**5.5100e-003**	**0.9174**	**0.2418**	**5.0800e-003**	**0.2468**		**898.2301**	**898.2301**	**0.0205**	**0.0210**	**905.0119**

3.2 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					
Fugitive Dust					0.0109	0.0000	0.0109	1.1800e-003	0.0000	1.1800e-003			0.0000			0.0000
Off-Road	1.1219	9.5273	9.1944	0.0199		0.4722	0.4722		0.4345	0.4345		1,931.1811	1,931.1811	0.6246		1,946.7957
Total	**1.1219**	**9.5273**	**9.1944**	**0.0199**	**0.0109**	**0.4722**	**0.4832**	**1.1800e-003**	**0.4345**	**0.4356**		**1,931.1811**	**1,931.1811**	**0.6246**		**1,946.7957**

Unmitigated Construction Off-Site

Date: 9/15/2021 11:06 AM

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

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	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	0.2338	0.2093	3.6496	8.5500e-003	0.9119	5.2000e-003	0.9171	0.2418	4.7900e-003	0.2465		875.0209	875.0209	0.0181	0.0192	881.1920
Total	**0.2338**	**0.2093**	**3.6496**	**8.5500e-003**	**0.9119**	**5.2000e-003**	**0.9171**	**0.2418**	**4.7900e-003**	**0.2465**		**875.0209**	**875.0209**	**0.0181**	**0.0192**	**881.1920**

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					0.0109	0.0000	0.0109	1.1800e-003	0.0000	1.1800e-003			0.0000			0.0000
Off-Road	0.2869	6.8583	12.6277	0.0199		0.0325	0.0325		0.0325	0.0325	0.0000	1,931.1811	1,931.1811	0.6246		1,946.7957
Total	**0.2869**	**6.8583**	**12.6277**	**0.0199**	**0.0109**	**0.0325**	**0.0434**	**1.1800e-003**	**0.0325**	**0.0337**	**0.0000**	**1,931.1811**	**1,931.1811**	**0.6246**		**1,946.7957**

Mitigated Construction Off-Site

Date: 9/15/2021 11:06 AM

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

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	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	0.2338	0.2093	3.6496	8.5500e-003	0.9119	5.2000e-003	0.9171	0.2418	4.7900e-003	0.2465		875.0209	875.0209	0.0181	0.0192	881.1920
Total	**0.2338**	**0.2093**	**3.6496**	**8.5500e-003**	**0.9119**	**5.2000e-003**	**0.9171**	**0.2418**	**4.7900e-003**	**0.2465**		**875.0209**	**875.0209**	**0.0181**	**0.0192**	**881.1920**

3.2 Grading - 2024

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					0.0109	0.0000	0.0109	1.1800e-003	0.0000	1.1800e-003			0.0000			0.0000
Off-Road	1.0679	8.6844	9.1370	0.0200		0.4301	0.4301		0.3957	0.3957		1,931.8700	1,931.8700	0.6248		1,947.4902
Total	**1.0679**	**8.6844**	**9.1370**	**0.0200**	**0.0109**	**0.4301**	**0.4411**	**1.1800e-003**	**0.3957**	**0.3969**		**1,931.8700**	**1,931.8700**	**0.6248**		**1,947.4902**

Unmitigated Construction Off-Site

Date: 9/15/2021 11:06 AM

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

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	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	0.2159	0.1844	3.2587	8.3200e-003	0.9119	4.9000e-003	0.9168	0.2418	4.5100e-003	0.2463		858.5570	858.5570	0.0159	0.0176	864.1912
Total	**0.2159**	**0.1844**	**3.2587**	**8.3200e-003**	**0.9119**	**4.9000e-003**	**0.9168**	**0.2418**	**4.5100e-003**	**0.2463**		**858.5570**	**858.5570**	**0.0159**	**0.0176**	**864.1912**

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					0.0109	0.0000	0.0109	1.1800e-003	0.0000	1.1800e-003			0.0000			0.0000
Off-Road	0.2869	6.8583	12.6277	0.0200		0.0325	0.0325		0.0325	0.0325	0.0000	1,931.8700	1,931.8700	0.6248		1,947.4902
Total	**0.2869**	**6.8583**	**12.6277**	**0.0200**	**0.0109**	**0.0325**	**0.0434**	**1.1800e-003**	**0.0325**	**0.0337**	**0.0000**	**1,931.8700**	**1,931.8700**	**0.6248**		**1,947.4902**

Mitigated Construction Off-Site

Date: 9/15/2021 11:06 AM

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

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	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	0.2159	0.1844	3.2587	8.3200e-003	0.9119	4.9000e-003	0.9168	0.2418	4.5100e-003	0.2463		858.5570	858.5570	0.0159	0.0176	864.1912
Total	**0.2159**	**0.1844**	**3.2587**	**8.3200e-003**	**0.9119**	**4.9000e-003**	**0.9168**	**0.2418**	**4.5100e-003**	**0.2463**		**858.5570**	**858.5570**	**0.0159**	**0.0176**	**864.1912**

3.3 Trenching - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2946	3.0866	1.9964	8.8200e-003		0.0946	0.0946		0.0870	0.0870		853.7352	853.7352	0.2761		860.6381
Total	**0.2946**	**3.0866**	**1.9964**	**8.8200e-003**		**0.0946**	**0.0946**		**0.0870**	**0.0870**		**853.7352**	**853.7352**	**0.2761**		**860.6381**

Unmitigated Construction Off-Site

Date: 9/15/2021 11:06 AM

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

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	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	0.1378	0.1362	2.2179	4.5500e-003	0.4559	2.9300e-003	0.4589	0.1209	2.7000e-003	0.1236		461.3135	461.3135	0.0116	0.0116	465.0576
Total	**0.1378**	**0.1362**	**2.2179**	**4.5500e-003**	**0.4559**	**2.9300e-003**	**0.4589**	**0.1209**	**2.7000e-003**	**0.1236**		**461.3135**	**461.3135**	**0.0116**	**0.0116**	**465.0576**

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	0.1448	2.3343	4.7048	8.8200e-003		0.0145	0.0145		0.0145	0.0145	0.0000	853.7352	853.7352	0.2761		860.6381
Total	**0.1448**	**2.3343**	**4.7048**	**8.8200e-003**		**0.0145**	**0.0145**		**0.0145**	**0.0145**	**0.0000**	**853.7352**	**853.7352**	**0.2761**		**860.6381**

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					

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

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

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	0.1378	0.1362	2.2179	4.5500e-003	0.4559	2.9300e-003	0.4589	0.1209	2.7000e-003	0.1236		461.3135	461.3135	0.0116	0.0116	465.0576
Total	**0.1378**	**0.1362**	**2.2179**	**4.5500e-003**	**0.4559**	**2.9300e-003**	**0.4589**	**0.1209**	**2.7000e-003**	**0.1236**		**461.3135**	**461.3135**	**0.0116**	**0.0116**	**465.0576**

3.3 Trenching - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2685	2.5083	1.9753	8.8300e-003		0.0788	0.0788		0.0725	0.0725		854.1842	854.1842	0.2763		861.0907
Total	**0.2685**	**2.5083**	**1.9753**	**8.8300e-003**		**0.0788**	**0.0788**		**0.0725**	**0.0725**		**854.1842**	**854.1842**	**0.2763**		**861.0907**

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

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

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

Worker	0.1268	0.1192	2.0061	4.4100e-003	0.4559	2.7600e-003	0.4587	0.1209	2.5400e-003	0.1234		449.1150	449.1150	0.0102	0.0105	452.5059
Total	**0.1268**	**0.1192**	**2.0061**	**4.4100e-003**	**0.4559**	**2.7600e-003**	**0.4587**	**0.1209**	**2.5400e-003**	**0.1234**		**449.1150**	**449.1150**	**0.0102**	**0.0105**	**452.5059**

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	0.1448	2.3343	4.7048	8.8300e-003		0.0145	0.0145		0.0145	0.0145	0.0000	854.1842	854.1842	0.2763		861.0907
Total	**0.1448**	**2.3343**	**4.7048**	**8.8300e-003**		**0.0145**	**0.0145**		**0.0145**	**0.0145**	**0.0000**	**854.1842**	**854.1842**	**0.2763**		**861.0907**

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	0.1268	0.1192	2.0061	4.4100e-003	0.4559	2.7600e-003	0.4587	0.1209	2.5400e-003	0.1234		449.1150	449.1150	0.0102	0.0105	452.5059
Total	**0.1268**	**0.1192**	**2.0061**	**4.4100e-003**	**0.4559**	**2.7600e-003**	**0.4587**	**0.1209**	**2.5400e-003**	**0.1234**		**449.1150**	**449.1150**	**0.0102**	**0.0105**	**452.5059**

Date: 9/15/2021 11:06 AM

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

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

3.3 Trenching - 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	0.2569	2.1885	1.9718	8.8300e-003		0.0701	0.0701		0.0645	0.0645		854.4952	854.4952	0.2764		861.4042
Total	**0.2569**	**2.1885**	**1.9718**	**8.8300e-003**		**0.0701**	**0.0701**		**0.0645**	**0.0645**		**854.4952**	**854.4952**	**0.2764**		**861.4042**

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	0.1169	0.1046	1.8248	4.2800e-003	0.4559	2.6000e-003	0.4585	0.1209	2.3900e-003	0.1233		437.5104	437.5104	9.0400e-003	9.6000e-003	440.5960
Total	**0.1169**	**0.1046**	**1.8248**	**4.2800e-003**	**0.4559**	**2.6000e-003**	**0.4585**	**0.1209**	**2.3900e-003**	**0.1233**		**437.5104**	**437.5104**	**9.0400e-003**	**9.6000e-003**	**440.5960**

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

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

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	0.1448	2.3343	4.7048	8.8300e-003		0.0145	0.0145		0.0145	0.0145	0.0000	854.4952	854.4952	0.2764		861.4042
Total	**0.1448**	**2.3343**	**4.7048**	**8.8300e-003**		**0.0145**	**0.0145**		**0.0145**	**0.0145**	**0.0000**	**854.4952**	**854.4952**	**0.2764**		**861.4042**

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	0.1169	0.1046	1.8248	4.2800e-003	0.4559	2.6000e-003	0.4585	0.1209	2.3900e-003	0.1233		437.5104	437.5104	9.0400e-003	9.6000e-003	440.5960
Total	**0.1169**	**0.1046**	**1.8248**	**4.2800e-003**	**0.4559**	**2.6000e-003**	**0.4585**	**0.1209**	**2.3900e-003**	**0.1233**		**437.5104**	**437.5104**	**9.0400e-003**	**9.6000e-003**	**440.5960**

3.3 Trenching - 2024

Unmitigated Construction On-Site

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AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

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	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2513	2.0051	1.9722	8.8300e-003		0.0647	0.0647		0.0596	0.0596		854.9085	854.9085	0.2765		861.8209
Total	**0.2513**	**2.0051**	**1.9722**	**8.8300e-003**		**0.0647**	**0.0647**		**0.0596**	**0.0596**		**854.9085**	**854.9085**	**0.2765**		**861.8209**

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	0.1080	0.0922	1.6294	4.1600e-003	0.4559	2.4500e-003	0.4584	0.1209	2.2600e-003	0.1231		429.2785	429.2785	7.9600e-003	8.7900e-003	432.0956
Total	**0.1080**	**0.0922**	**1.6294**	**4.1600e-003**	**0.4559**	**2.4500e-003**	**0.4584**	**0.1209**	**2.2600e-003**	**0.1231**		**429.2785**	**429.2785**	**7.9600e-003**	**8.7900e-003**	**432.0956**

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					

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

Off-Road	0.1448	2.3343	4.7048	8.8300e-003		0.0145	0.0145		0.0145	0.0145	0.0000	854.9085	854.9085	0.2765		861.8209
Total	**0.1448**	**2.3343**	**4.7048**	**8.8300e-003**		**0.0145**	**0.0145**		**0.0145**	**0.0145**	**0.0000**	**854.9085**	**854.9085**	**0.2765**		**861.8209**

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	0.1080	0.0922	1.6294	4.1600e-003	0.4559	2.4500e-003	0.4584	0.1209	2.2600e-003	0.1231		429.2785	429.2785	7.9600e-003	8.7900e-003	432.0956
Total	**0.1080**	**0.0922**	**1.6294**	**4.1600e-003**	**0.4559**	**2.4500e-003**	**0.4584**	**0.1209**	**2.2600e-003**	**0.1231**		**429.2785**	**429.2785**	**7.9600e-003**	**8.7900e-003**	**432.0956**

3.4 Well Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	6.9953	67.1294	48.4187	0.2398		2.1804	2.1804		2.0711	2.0711		23,009.9666	23,009.9666	4.8295		23,130.7050
Total	**6.9953**	**67.1294**	**48.4187**	**0.2398**		**2.1804**	**2.1804**		**2.0711**	**2.0711**		**23,009.9666**	**23,009.9666**	**4.8295**		**23,130.7050**

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AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

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

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	0.1796	4.2410	0.9780	0.0184	0.6659	0.0799	0.7457	0.1915	0.0764	0.2679		1,939.7084	1,939.7084	0.0144	0.2804	2,023.6156
Worker	0.4134	0.4087	6.6536	0.0137	1.3678	8.8000e-003	1.3766	0.3626	8.1000e-003	0.3707		1,383.9405	1,383.9405	0.0348	0.0348	1,395.1727
Total	**0.5930**	**4.6498**	**7.6316**	**0.0321**	**2.0337**	**0.0887**	**2.1223**	**0.5541**	**0.0845**	**0.6386**		**3,323.6489**	**3,323.6489**	**0.0492**	**0.3151**	**3,418.7883**

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	3.6627	59.1819	119.0781	0.2398		0.3653	0.3653		0.3653	0.3653	0.0000	23,009.9666	23,009.9666	4.8295		23,130.7050
Total	**3.6627**	**59.1819**	**119.0781**	**0.2398**		**0.3653**	**0.3653**		**0.3653**	**0.3653**	**0.0000**	**23,009.9666**	**23,009.9666**	**4.8295**		**23,130.7050**

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AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

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

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	0.1796	4.2410	0.9780	0.0184	0.6659	0.0799	0.7457	0.1915	0.0764	0.2679		1,939.7084	1,939.7084	0.0144	0.2804	2,023.6156
Worker	0.4134	0.4087	6.6536	0.0137	1.3678	8.8000e-003	1.3766	0.3626	8.1000e-003	0.3707		1,383.9405	1,383.9405	0.0348	0.0348	1,395.1727
Total	**0.5930**	**4.6498**	**7.6316**	**0.0321**	**2.0337**	**0.0887**	**2.1223**	**0.5541**	**0.0845**	**0.6386**		**3,323.6489**	**3,323.6489**	**0.0492**	**0.3151**	**3,418.7883**

3.4 Well Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	6.4703	57.1157	47.6888	0.2391		1.8558	1.8558		1.7637	1.7637		22,941.1819	22,941.1819	4.7916		23,060.9726
Total	**6.4703**	**57.1157**	**47.6888**	**0.2391**		**1.8558**	**1.8558**		**1.7637**	**1.7637**		**22,941.1819**	**22,941.1819**	**4.7916**		**23,060.9726**

Unmitigated Construction Off-Site

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AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

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	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	0.1048	3.3852	0.7108	0.0178	0.6659	0.0427	0.7085	0.1915	0.0408	0.2323		1,881.0119	1,881.0119	0.0106	0.2707	1,961.9393
Worker	0.3803	0.3576	6.0181	0.0132	1.3678	8.2700e-003	1.3761	0.3626	7.6100e-003	0.3702		1,347.3451	1,347.3451	0.0307	0.0316	1,357.5178
Total	**0.4850**	**3.7428**	**6.7289**	**0.0311**	**2.0337**	**0.0509**	**2.0846**	**0.5541**	**0.0484**	**0.6025**		**3,228.3569**	**3,228.3569**	**0.0413**	**0.3022**	**3,319.4571**

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	3.6627	59.1819	119.0781	0.2391		0.3653	0.3653		0.3653	0.3653	0.0000	22,941.1819	22,941.1819	4.7916		23,060.9726
Total	**3.6627**	**59.1819**	**119.0781**	**0.2391**		**0.3653**	**0.3653**		**0.3653**	**0.3653**	**0.0000**	**22,941.1819**	**22,941.1819**	**4.7916**		**23,060.9726**

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					

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

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

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	0.1048	3.3852	0.7108	0.0178	0.6659	0.0427	0.7085	0.1915	0.0408	0.2323		1,881.0119	1,881.0119	0.0106	0.2707	1,961.9393
Worker	0.3803	0.3576	6.0181	0.0132	1.3678	8.2700e-003	1.3761	0.3626	7.6100e-003	0.3702		1,347.3451	1,347.3451	0.0307	0.0316	1,357.5178
Total	**0.4850**	**3.7428**	**6.7289**	**0.0311**	**2.0337**	**0.0509**	**2.0846**	**0.5541**	**0.0484**	**0.6025**		**3,228.3569**	**3,228.3569**	**0.0413**	**0.3022**	**3,319.4571**

3.4 Well Construction - 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	6.1219	50.0154	47.1875	0.2382		1.6208	1.6208		1.5412	1.5412		22,858.9137	22,858.9137	4.7494		22,977.6477
Total	**6.1219**	**50.0154**	**47.1875**	**0.2382**		**1.6208**	**1.6208**		**1.5412**	**1.5412**		**22,858.9137**	**22,858.9137**	**4.7494**		**22,977.6477**

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	0.0450	2.6306	0.5144	0.0171	0.6659	0.0173	0.6832	0.1915	0.0166	0.2080		1,806.5066	1,806.5066	7.5200e-003	0.2586	1,883.7537

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

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

Worker	0.3508	0.3139	5.4743	0.0128	1.3678	7.8000e-003	1.3756	0.3626	7.1800e-003	0.3698		1,312.5313	1,312.5313	0.0271	0.0288	1,321.7880
Total	**0.3957**	**2.9445**	**5.9887**	**0.0300**	**2.0337**	**0.0251**	**2.0588**	**0.5541**	**0.0237**	**0.5778**		**3,119.0378**	**3,119.0378**	**0.0346**	**0.2874**	**3,205.5417**

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	3.6627	59.1819	119.0781	0.2382		0.3653	0.3653		0.3653	0.3653	0.0000	22,858.9136	22,858.9136	4.7494		22,977.6477
Total	**3.6627**	**59.1819**	**119.0781**	**0.2382**		**0.3653**	**0.3653**		**0.3653**	**0.3653**	**0.0000**	**22,858.9136**	**22,858.9136**	**4.7494**		**22,977.6477**

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	0.0450	2.6306	0.5144	0.0171	0.6659	0.0173	0.6832	0.1915	0.0166	0.2080		1,806.5066	1,806.5066	7.5200e-003	0.2586	1,883.7537
Worker	0.3508	0.3139	5.4743	0.0128	1.3678	7.8000e-003	1.3756	0.3626	7.1800e-003	0.3698		1,312.5313	1,312.5313	0.0271	0.0288	1,321.7880
Total	**0.3957**	**2.9445**	**5.9887**	**0.0300**	**2.0337**	**0.0251**	**2.0588**	**0.5541**	**0.0237**	**0.5778**		**3,119.0378**	**3,119.0378**	**0.0346**	**0.2874**	**3,205.5417**

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AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

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

3.4 Well Construction - 2024

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	6.0111	46.1675	47.2375	0.2384		1.4864	1.4864		1.4101	1.4101		22,871.1321	22,871.1321	4.7533		22,989.9647
Total	**6.0111**	**46.1675**	**47.2375**	**0.2384**		**1.4864**	**1.4864**		**1.4101**	**1.4101**		**22,871.1321**	**22,871.1321**	**4.7533**		**22,989.9647**

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	0.0430	2.5577	0.4790	0.0168	0.6659	0.0188	0.6846	0.1915	0.0180	0.2094		1,767.0455	1,767.0455	7.2000e-003	0.2522	1,842.3655
Worker	0.3239	0.2767	4.8881	0.0125	1.3678	7.3500e-003	1.3751	0.3626	6.7700e-003	0.3694		1,287.8355	1,287.8355	0.0239	0.0264	1,296.2867
Total	**0.3669**	**2.8343**	**5.3671**	**0.0292**	**2.0337**	**0.0261**	**2.0598**	**0.5541**	**0.0247**	**0.5788**		**3,054.8810**	**3,054.8810**	**0.0311**	**0.2785**	**3,138.6523**

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AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

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

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	3.6627	59.1819	119.0781	0.2384		0.3653	0.3653		0.3653	0.3653	0.0000	22,871.1320	22,871.1320	4.7533		22,989.9647
Total	**3.6627**	**59.1819**	**119.0781**	**0.2384**		**0.3653**	**0.3653**		**0.3653**	**0.3653**	**0.0000**	**22,871.1320**	**22,871.1320**	**4.7533**		**22,989.9647**

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	0.0430	2.5577	0.4790	0.0168	0.6659	0.0188	0.6846	0.1915	0.0180	0.2094		1,767.0455	1,767.0455	7.2000e-003	0.2522	1,842.3655
Worker	0.3239	0.2767	4.8881	0.0125	1.3678	7.3500e-003	1.3751	0.3626	6.7700e-003	0.3694		1,287.8355	1,287.8355	0.0239	0.0264	1,296.2867
Total	**0.3669**	**2.8343**	**5.3671**	**0.0292**	**2.0337**	**0.0261**	**2.0598**	**0.5541**	**0.0247**	**0.5788**		**3,054.8810**	**3,054.8810**	**0.0311**	**0.2785**	**3,138.6523**

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

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

AVEK - Recovery Facilities

Antelope Valley APCD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	6.50	Acre	6.50	283,140.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Proposed Extraction Wells/Recovery [Recovery Facilities, Table 2.4-4]

Land Use - Per AVEK Project Description, 6.5 acres for this phase

Construction Phase - Per project schedule, estimated construction is from December 2021 through April 2024.

Off-road Equipment - Per AVEK AECOM Technical AQ Memo -
2 grader (174 hp, 6 hours per day)
2 wheeled loaders (313 hp; 1 hour per day)
1 water truck (200 hp, 1 hour per day)

Off-road Equipment - Per AVEK AECOM Technical AQ Memo -
2 hydraulic excavators (180 hp, 6 hours per day)

Off-road Equipment - Per AVEK AECOM Technical AQ Memo -
2 drilling rigs (500 HP, 24 hrs per day for 90 days)
2 off-highway trucks (479 hp, 4 hours per day)
2 Test pumps (200 hp, 60 hrs per well)
2 skip loader (88 hp, 1 hour per day)
2 small roller compactor (114 hp, 1 hour per day)

Construction Off-road Equipment Mitigation - Per AVEK AECOM 2017 technical memorandum, AQ-1 mitigation measure applied.

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AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

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

Grading - Excess spoil from excavation operations will incorporated into the recharge basin berms and thus will not be hauled off site.

Trips and VMT - Per the project description, 60 worker trips and 12 vendor trips per day at 60 miles in length.

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstructionPhase	NumDays	230.00	630.00
tblConstructionPhase	NumDays	20.00	630.00
tblConstructionPhase	PhaseEndDate	11/15/2022	4/30/2024
tblConstructionPhase	PhaseEndDate	12/28/2021	4/30/2024
tblConstructionPhase	PhaseEndDate	12/28/2021	4/30/2024
tblConstructionPhase	PhaseStartDate	12/29/2021	12/1/2021
tblConstructionPhase	PhaseStartDate	12/29/2021	12/1/2021
tblGrading	AcresOfGrading	472.50	6.50
tblOffRoadEquipment	HorsePower	402.00	479.00
tblOffRoadEquipment	HorsePower	97.00	313.00

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

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

tblOffRoadEquipment	HorsePower	158.00	180.00
tblOffRoadEquipment	HorsePower	221.00	500.00
tblOffRoadEquipment	HorsePower	402.00	479.00
tblOffRoadEquipment	HorsePower	84.00	200.00
tblOffRoadEquipment	HorsePower	65.00	88.00
tblOffRoadEquipment	HorsePower	80.00	114.00
tblOffRoadEquipment	HorsePower	187.00	174.00
tblOffRoadEquipment	LoadFactor	0.37	0.41
tblOffRoadEquipment	LoadFactor	0.37	0.37
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	OffRoadEquipmentType		Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Rollers
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripLength	6.60	60.00
tblTripsAndVMT	VendorTripLength	6.60	60.00
tblTripsAndVMT	VendorTripLength	6.60	60.00
tblTripsAndVMT	VendorTripNumber	46.00	12.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripNumber	13.00	20.00
tblTripsAndVMT	WorkerTripNumber	5.00	10.00
tblTripsAndVMT	WorkerTripNumber	119.00	30.00

2.0 Emissions Summary

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AVEK - Recovery Facilities - Antelope Valley APCD Air District, 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					
2021	9.7067	88.8078	71.1227	0.3112	3.4124	3.0332	6.4456	0.9179	2.8587	3.7765	0.0000	30,195.5994	30,195.5994	5.8059	0.3525	30,445.7813
2022	8.8392	74.9254	68.8344	0.3093	3.4124	2.5434	5.9558	0.9179	2.3979	3.3157	0.0000	30,004.9304	30,004.9304	5.7572	0.3361	30,249.0232
2023	8.2492	65.1610	67.1834	0.3070	3.4124	2.1960	5.6084	0.9179	2.0711	2.9890	0.0000	29,788.1775	29,788.1775	5.7059	0.3183	30,025.6748
2024	8.0266	60.1314	66.2603	0.3062	3.4124	2.0148	5.4271	0.9179	1.8969	2.8148	0.0000	29,719.0905	29,719.0905	5.7043	0.3068	29,953.1249
Maximum	**9.7067**	**88.8078**	**71.1227**	**0.3112**	**3.4124**	**3.0332**	**6.4456**	**0.9179**	**2.8587**	**3.7765**	**0.0000**	**30,195.5994**	**30,195.5994**	**5.8059**	**0.3525**	**30,445.7813**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	5.0949	73.6921	147.4949	0.3112	3.4124	0.5097	3.9221	0.9179	0.5049	1.4228	0.0000	30,195.5993	30,195.5993	5.8059	0.3525	30,445.7813
2022	4.9582	72.6866	146.2634	0.3093	3.4124	0.4714	3.8838	0.9179	0.4683	1.3861	0.0000	30,004.9304	30,004.9304	5.7572	0.3361	30,249.0232
2023	4.8429	71.8044	145.2403	0.3070	3.4124	0.4452	3.8575	0.9179	0.4432	1.3611	0.0000	29,788.1774	29,788.1774	5.7059	0.3183	30,025.6747
2024	4.7907	71.6489	144.3241	0.3062	3.4124	0.4457	3.8581	0.9179	0.4437	1.3616	0.0000	29,719.0905	29,719.0905	5.7043	0.3068	29,953.1249
Maximum	**5.0949**	**73.6921**	**147.4949**	**0.3112**	**3.4124**	**0.5097**	**3.9221**	**0.9179**	**0.5049**	**1.4228**	**0.0000**	**30,195.5993**	**30,195.5993**	**5.8059**	**0.3525**	**30,445.7813**

AVEK - Recovery Facilities - Antelope Valley APCD Air District, 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	**43.46**	**-0.28**	**-113.36**	**0.00**	**0.00**	**80.87**	**33.77**	**0.00**	**79.84**	**57.11**	**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	Grading	Grading	12/1/2021	4/30/2024	5	630	
2	Trenching	Trenching	12/1/2021	4/30/2024	5	630	
3	Well Construction	Building Construction	12/1/2021	4/30/2024	5	630	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 6.5

Acres of Paving: 6.5

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
Grading	Off-Highway Trucks	1	4.00	479	0.38
Grading	Tractors/Loaders/Backhoes	2	1.00	313	0.41
Trenching	Excavators	2	6.00	180	0.38
Well Construction	Bore/Drill Rigs	2	24.00	500	0.50
Well Construction	Off-Highway Trucks	2	4.00	479	0.38
Well Construction	Pumps	2	24.00	200	0.74
Well Construction	Skid Steer Loaders	2	1.00	88	0.37
Well Construction	Rollers	2	1.00	114	0.38

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

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

Grading	Graders	2	6.00	174	0.41

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
Grading	5	20.00	0.00	0.00	60.00	60.00	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	2	10.00	0.00	0.00	60.00	60.00	20.00	LD_Mix	HDT_Mix	HHDT
Well Construction	10	30.00	12.00	0.00	60.00	60.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0109	0.0000	0.0109	1.1800e-003	0.0000	1.1800e-003			0.0000			0.0000
Off-Road	1.4162	13.2744	9.6234	0.0199		0.6608	0.6608		0.6079	0.6079		1,930.4000	1,930.4000	0.6243		1,946.0083
Total	**1.4162**	**13.2744**	**9.6234**	**0.0199**	**0.0109**	**0.6608**	**0.6717**	**1.1800e-003**	**0.6079**	**0.6091**		**1,930.4000**	**1,930.4000**	**0.6243**		**1,946.0083**

Unmitigated Construction Off-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, 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	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	0.2738	0.2873	3.3687	8.1000e-003	0.9119	5.8700e-003	0.9177	0.2418	5.4000e-003	0.2472		820.5080	820.5080	0.0205	0.0239	828.1525
Total	**0.2738**	**0.2873**	**3.3687**	**8.1000e-003**	**0.9119**	**5.8700e-003**	**0.9177**	**0.2418**	**5.4000e-003**	**0.2472**		**820.5080**	**820.5080**	**0.0205**	**0.0239**	**828.1525**

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					0.0109	0.0000	0.0109	1.1800e-003	0.0000	1.1800e-003			0.0000			0.0000
Off-Road	0.2869	6.8583	12.6277	0.0199		0.0325	0.0325		0.0325	0.0325	0.0000	1,930.4000	1,930.4000	0.6243		1,946.0083
Total	**0.2869**	**6.8583**	**12.6277**	**0.0199**	**0.0109**	**0.0325**	**0.0434**	**1.1800e-003**	**0.0325**	**0.0337**	**0.0000**	**1,930.4000**	**1,930.4000**	**0.6243**		**1,946.0083**

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

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

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

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	0.2738	0.2873	3.3687	8.1000e-003	0.9119	5.8700e-003	0.9177	0.2418	5.4000e-003	0.2472		820.5080	820.5080	0.0205	0.0239	828.1525
Total	**0.2738**	**0.2873**	**3.3687**	**8.1000e-003**	**0.9119**	**5.8700e-003**	**0.9177**	**0.2418**	**5.4000e-003**	**0.2472**		**820.5080**	**820.5080**	**0.0205**	**0.0239**	**828.1525**

3.2 Grading - 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					0.0109	0.0000	0.0109	1.1800e-003	0.0000	1.1800e-003			0.0000			0.0000
Off-Road	1.2366	10.9894	9.3176	0.0199		0.5497	0.5497		0.5057	0.5057		1,930.7201	1,930.7201	0.6244		1,946.3309
Total	**1.2366**	**10.9894**	**9.3176**	**0.0199**	**0.0109**	**0.5497**	**0.5606**	**1.1800e-003**	**0.5057**	**0.5069**		**1,930.7201**	**1,930.7201**	**0.6244**		**1,946.3309**

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					

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

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

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	0.2532	0.2513	3.0470	7.8600e-003	0.9119	5.5100e-003	0.9174	0.2418	5.0800e-003	0.2468		799.1556	799.1556	0.0181	0.0217	806.0794
Total	**0.2532**	**0.2513**	**3.0470**	**7.8600e-003**	**0.9119**	**5.5100e-003**	**0.9174**	**0.2418**	**5.0800e-003**	**0.2468**		**799.1556**	**799.1556**	**0.0181**	**0.0217**	**806.0794**

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					0.0109	0.0000	0.0109	1.1800e-003	0.0000	1.1800e-003			0.0000			0.0000
Off-Road	0.2869	6.8583	12.6277	0.0199		0.0325	0.0325		0.0325	0.0325	0.0000	1,930.7201	1,930.7201	0.6244		1,946.3309
Total	**0.2869**	**6.8583**	**12.6277**	**0.0199**	**0.0109**	**0.0325**	**0.0434**	**1.1800e-003**	**0.0325**	**0.0337**	**0.0000**	**1,930.7201**	**1,930.7201**	**0.6244**		**1,946.3309**

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

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

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

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	0.2532	0.2513	3.0470	7.8600e-003	0.9119	5.5100e-003	0.9174	0.2418	5.0800e-003	0.2468		799.1556	799.1556	0.0181	0.0217	806.0794
Total	**0.2532**	**0.2513**	**3.0470**	**7.8600e-003**	**0.9119**	**5.5100e-003**	**0.9174**	**0.2418**	**5.0800e-003**	**0.2468**		**799.1556**	**799.1556**	**0.0181**	**0.0217**	**806.0794**

3.2 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					
Fugitive Dust					0.0109	0.0000	0.0109	1.1800e-003	0.0000	1.1800e-003			0.0000			0.0000
Off-Road	1.1219	9.5273	9.1944	0.0199		0.4722	0.4722		0.4345	0.4345		1,931.1811	1,931.1811	0.6246		1,946.7957
Total	**1.1219**	**9.5273**	**9.1944**	**0.0199**	**0.0109**	**0.4722**	**0.4832**	**1.1800e-003**	**0.4345**	**0.4356**		**1,931.1811**	**1,931.1811**	**0.6246**		**1,946.7957**

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

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

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

Worker	0.2348	0.2206	2.7715	7.6100e-003	0.9119	5.2000e-003	0.9171	0.2418	4.7900e-003	0.2465		778.8140	778.8140	0.0161	0.0198	785.1146
Total	**0.2348**	**0.2206**	**2.7715**	**7.6100e-003**	**0.9119**	**5.2000e-003**	**0.9171**	**0.2418**	**4.7900e-003**	**0.2465**		**778.8140**	**778.8140**	**0.0161**	**0.0198**	**785.1146**

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					0.0109	0.0000	0.0109	1.1800e-003	0.0000	1.1800e-003			0.0000			0.0000
Off-Road	0.2869	6.8583	12.6277	0.0199		0.0325	0.0325		0.0325	0.0325	0.0000	1,931.1811	1,931.1811	0.6246		1,946.7957
Total	**0.2869**	**6.8583**	**12.6277**	**0.0199**	**0.0109**	**0.0325**	**0.0434**	**1.1800e-003**	**0.0325**	**0.0337**	**0.0000**	**1,931.1811**	**1,931.1811**	**0.6246**		**1,946.7957**

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	0.2348	0.2206	2.7715	7.6100e-003	0.9119	5.2000e-003	0.9171	0.2418	4.7900e-003	0.2465		778.8140	778.8140	0.0161	0.0198	785.1146

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

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

Total	**0.2348**	**0.2206**	**2.7715**	**7.6100e-003**	**0.9119**	**5.2000e-003**	**0.9171**	**0.2418**	**4.7900e-003**	**0.2465**		**778.8140**	**778.8140**	**0.0161**	**0.0198**	**785.1146**

3.2 Grading - 2024

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					0.0109	0.0000	0.0109	1.1800e-003	0.0000	1.1800e-003			0.0000			0.0000
Off-Road	1.0679	8.6844	9.1370	0.0200		0.4301	0.4301		0.3957	0.3957		1,931.8700	1,931.8700	0.6248		1,947.4902
Total	**1.0679**	**8.6844**	**9.1370**	**0.0200**	**0.0109**	**0.4301**	**0.4411**	**1.1800e-003**	**0.3957**	**0.3969**		**1,931.8700**	**1,931.8700**	**0.6248**		**1,947.4902**

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	0.2180	0.1944	2.4776	7.4100e-003	0.9119	4.9000e-003	0.9168	0.2418	4.5100e-003	0.2463		764.5000	764.5000	0.0142	0.0181	770.2551
Total	**0.2180**	**0.1944**	**2.4776**	**7.4100e-003**	**0.9119**	**4.9000e-003**	**0.9168**	**0.2418**	**4.5100e-003**	**0.2463**		**764.5000**	**764.5000**	**0.0142**	**0.0181**	**770.2551**

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AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

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

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					0.0109	0.0000	0.0109	1.1800e-003	0.0000	1.1800e-003			0.0000			0.0000
Off-Road	0.2869	6.8583	12.6277	0.0200		0.0325	0.0325		0.0325	0.0325	0.0000	1,931.8700	1,931.8700	0.6248		1,947.4902
Total	**0.2869**	**6.8583**	**12.6277**	**0.0200**	**0.0109**	**0.0325**	**0.0434**	**1.1800e-003**	**0.0325**	**0.0337**	**0.0000**	**1,931.8700**	**1,931.8700**	**0.6248**		**1,947.4902**

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	0.2180	0.1944	2.4776	7.4100e-003	0.9119	4.9000e-003	0.9168	0.2418	4.5100e-003	0.2463		764.5000	764.5000	0.0142	0.0181	770.2551
Total	**0.2180**	**0.1944**	**2.4776**	**7.4100e-003**	**0.9119**	**4.9000e-003**	**0.9168**	**0.2418**	**4.5100e-003**	**0.2463**		**764.5000**	**764.5000**	**0.0142**	**0.0181**	**770.2551**

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

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

3.3 Trenching - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2946	3.0866	1.9964	8.8200e-003		0.0946	0.0946		0.0870	0.0870		853.7352	853.7352	0.2761		860.6381
Total	**0.2946**	**3.0866**	**1.9964**	**8.8200e-003**		**0.0946**	**0.0946**		**0.0870**	**0.0870**		**853.7352**	**853.7352**	**0.2761**		**860.6381**

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	0.1369	0.1437	1.6844	4.0500e-003	0.4559	2.9300e-003	0.4589	0.1209	2.7000e-003	0.1236		410.2540	410.2540	0.0103	0.0120	414.0762
Total	**0.1369**	**0.1437**	**1.6844**	**4.0500e-003**	**0.4559**	**2.9300e-003**	**0.4589**	**0.1209**	**2.7000e-003**	**0.1236**		**410.2540**	**410.2540**	**0.0103**	**0.0120**	**414.0762**

Mitigated Construction On-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, 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	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1448	2.3343	4.7048	8.8200e-003		0.0145	0.0145		0.0145	0.0145	0.0000	853.7352	853.7352	0.2761		860.6381
Total	**0.1448**	**2.3343**	**4.7048**	**8.8200e-003**		**0.0145**	**0.0145**		**0.0145**	**0.0145**	**0.0000**	**853.7352**	**853.7352**	**0.2761**		**860.6381**

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	0.1369	0.1437	1.6844	4.0500e-003	0.4559	2.9300e-003	0.4589	0.1209	2.7000e-003	0.1236		410.2540	410.2540	0.0103	0.0120	414.0762
Total	**0.1369**	**0.1437**	**1.6844**	**4.0500e-003**	**0.4559**	**2.9300e-003**	**0.4589**	**0.1209**	**2.7000e-003**	**0.1236**		**410.2540**	**410.2540**	**0.0103**	**0.0120**	**414.0762**

3.3 Trenching - 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

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AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

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

Category	lb/day										lb/day					
Off-Road	0.2685	2.5083	1.9753	8.8300e-003		0.0788	0.0788		0.0725	0.0725		854.1842	854.1842	0.2763		861.0907
Total	**0.2685**	**2.5083**	**1.9753**	**8.8300e-003**		**0.0788**	**0.0788**		**0.0725**	**0.0725**		**854.1842**	**854.1842**	**0.2763**		**861.0907**

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	0.1266	0.1257	1.5235	3.9300e-003	0.4559	2.7600e-003	0.4587	0.1209	2.5400e-003	0.1234		399.5778	399.5778	9.0700e-003	0.0109	403.0397
Total	**0.1266**	**0.1257**	**1.5235**	**3.9300e-003**	**0.4559**	**2.7600e-003**	**0.4587**	**0.1209**	**2.5400e-003**	**0.1234**		**399.5778**	**399.5778**	**9.0700e-003**	**0.0109**	**403.0397**

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	0.1448	2.3343	4.7048	8.8300e-003		0.0145	0.0145		0.0145	0.0145	0.0000	854.1842	854.1842	0.2763		861.0907

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

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

Total	**0.1448**	**2.3343**	**4.7048**	**8.8300e-003**		**0.0145**	**0.0145**		**0.0145**	**0.0145**	**0.0000**	**854.1842**	**854.1842**	**0.2763**		**861.0907**

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	0.1266	0.1257	1.5235	3.9300e-003	0.4559	2.7600e-003	0.4587	0.1209	2.5400e-003	0.1234		399.5778	399.5778	9.0700e-003	0.0109	403.0397
Total	**0.1266**	**0.1257**	**1.5235**	**3.9300e-003**	**0.4559**	**2.7600e-003**	**0.4587**	**0.1209**	**2.5400e-003**	**0.1234**		**399.5778**	**399.5778**	**9.0700e-003**	**0.0109**	**403.0397**

3.3 Trenching - 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	0.2569	2.1885	1.9718	8.8300e-003		0.0701	0.0701		0.0645	0.0645		854.4952	854.4952	0.2764		861.4042
Total	**0.2569**	**2.1885**	**1.9718**	**8.8300e-003**		**0.0701**	**0.0701**		**0.0645**	**0.0645**		**854.4952**	**854.4952**	**0.2764**		**861.4042**

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AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

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

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	0.1174	0.1103	1.3857	3.8000e-003	0.4559	2.6000e-003	0.4585	0.1209	2.3900e-003	0.1233		389.4070	389.4070	8.0300e-003	9.9000e-003	392.5573
Total	**0.1174**	**0.1103**	**1.3857**	**3.8000e-003**	**0.4559**	**2.6000e-003**	**0.4585**	**0.1209**	**2.3900e-003**	**0.1233**		**389.4070**	**389.4070**	**8.0300e-003**	**9.9000e-003**	**392.5573**

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	0.1448	2.3343	4.7048	8.8300e-003		0.0145	0.0145		0.0145	0.0145	0.0000	854.4952	854.4952	0.2764		861.4042
Total	**0.1448**	**2.3343**	**4.7048**	**8.8300e-003**		**0.0145**	**0.0145**		**0.0145**	**0.0145**	**0.0000**	**854.4952**	**854.4952**	**0.2764**		**861.4042**

Mitigated Construction Off-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, 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	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	0.1174	0.1103	1.3857	3.8000e-003	0.4559	2.6000e-003	0.4585	0.1209	2.3900e-003	0.1233		389.4070	389.4070	8.0300e-003	9.9000e-003	392.5573
Total	**0.1174**	**0.1103**	**1.3857**	**3.8000e-003**	**0.4559**	**2.6000e-003**	**0.4585**	**0.1209**	**2.3900e-003**	**0.1233**		**389.4070**	**389.4070**	**8.0300e-003**	**9.9000e-003**	**392.5573**

3.3 Trenching - 2024

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	0.2513	2.0051	1.9722	8.8300e-003		0.0647	0.0647		0.0596	0.0596		854.9085	854.9085	0.2765		861.8209
Total	**0.2513**	**2.0051**	**1.9722**	**8.8300e-003**		**0.0647**	**0.0647**		**0.0596**	**0.0596**		**854.9085**	**854.9085**	**0.2765**		**861.8209**

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

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AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

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

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	0.1090	0.0972	1.2388	3.7100e-003	0.4559	2.4500e-003	0.4584	0.1209	2.2600e-003	0.1231		382.2500	382.2500	7.0900e-003	9.0600e-003	385.1275
Total	**0.1090**	**0.0972**	**1.2388**	**3.7100e-003**	**0.4559**	**2.4500e-003**	**0.4584**	**0.1209**	**2.2600e-003**	**0.1231**		**382.2500**	**382.2500**	**7.0900e-003**	**9.0600e-003**	**385.1275**

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	0.1448	2.3343	4.7048	8.8300e-003		0.0145	0.0145		0.0145	0.0145	0.0000	854.9085	854.9085	0.2765		861.8209
Total	**0.1448**	**2.3343**	**4.7048**	**8.8300e-003**		**0.0145**	**0.0145**		**0.0145**	**0.0145**	**0.0000**	**854.9085**	**854.9085**	**0.2765**		**861.8209**

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

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

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

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	0.1090	0.0972	1.2388	3.7100e-003	0.4559	2.4500e-003	0.4584	0.1209	2.2600e-003	0.1231		382.2500	382.2500	7.0900e-003	9.0600e-003	385.1275
Total	**0.1090**	**0.0972**	**1.2388**	**3.7100e-003**	**0.4559**	**2.4500e-003**	**0.4584**	**0.1209**	**2.2600e-003**	**0.1231**		**382.2500**	**382.2500**	**7.0900e-003**	**9.0600e-003**	**385.1275**

3.4 Well Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	6.9953	67.1294	48.4187	0.2398		2.1804	2.1804		2.0711	2.0711		23,009.9666	23,009.9666	4.8295		23,130.7050
Total	**6.9953**	**67.1294**	**48.4187**	**0.2398**		**2.1804**	**2.1804**		**2.0711**	**2.0711**		**23,009.9666**	**23,009.9666**	**4.8295**		**23,130.7050**

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	0.1792	4.4555	0.9781	0.0184	0.6659	0.0799	0.7458	0.1915	0.0764	0.2679		1,939.9737	1,939.9737	0.0143	0.2807	2,023.9726
Worker	0.4107	0.4310	5.0531	0.0122	1.3678	8.8000e-003	1.3766	0.3626	8.1000e-003	0.3707		1,230.7620	1,230.7620	0.0308	0.0359	1,242.2287

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

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

Total	**0.5899**	**4.8865**	**6.0312**	**0.0305**	**2.0337**	**0.0887**	**2.1224**	**0.5541**	**0.0845**	**0.6386**		**3,170.7356**	**3,170.7356**	**0.0451**	**0.3166**	**3,266.2013**

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	3.6627	59.1819	119.0781	0.2398		0.3653	0.3653		0.3653	0.3653	0.0000	23,009.9666	23,009.9666	4.8295		23,130.7050
Total	**3.6627**	**59.1819**	**119.0781**	**0.2398**		**0.3653**	**0.3653**		**0.3653**	**0.3653**	**0.0000**	**23,009.9666**	**23,009.9666**	**4.8295**		**23,130.7050**

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	0.1792	4.4555	0.9781	0.0184	0.6659	0.0799	0.7458	0.1915	0.0764	0.2679		1,939.9737	1,939.9737	0.0143	0.2807	2,023.9726
Worker	0.4107	0.4310	5.0531	0.0122	1.3678	8.8000e-003	1.3766	0.3626	8.1000e-003	0.3707		1,230.7620	1,230.7620	0.0308	0.0359	1,242.2287
Total	**0.5899**	**4.8865**	**6.0312**	**0.0305**	**2.0337**	**0.0887**	**2.1224**	**0.5541**	**0.0845**	**0.6386**		**3,170.7356**	**3,170.7356**	**0.0451**	**0.3166**	**3,266.2013**

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AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

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

3.4 Well Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	6.4703	57.1157	47.6888	0.2391		1.8558	1.8558		1.7637	1.7637		22,941.1819	22,941.1819	4.7916		23,060.9726
Total	**6.4703**	**57.1157**	**47.6888**	**0.2391**		**1.8558**	**1.8558**		**1.7637**	**1.7637**		**22,941.1819**	**22,941.1819**	**4.7916**		**23,060.9726**

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	0.1042	3.5581	0.7119	0.0178	0.6659	0.0427	0.7085	0.1915	0.0408	0.2323		1,881.3773	1,881.3773	0.0105	0.2710	1,962.3909
Worker	0.3798	0.3770	4.5704	0.0118	1.3678	8.2700e-003	1.3761	0.3626	7.6100e-003	0.3702		1,198.7335	1,198.7335	0.0272	0.0326	1,209.1191
Total	**0.4840**	**3.9351**	**5.2823**	**0.0296**	**2.0337**	**0.0509**	**2.0846**	**0.5541**	**0.0484**	**0.6025**		**3,080.1108**	**3,080.1108**	**0.0377**	**0.3036**	**3,171.5099**

Mitigated Construction On-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, 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	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6627	59.1819	119.0781	0.2391		0.3653	0.3653		0.3653	0.3653	0.0000	22,941.1819	22,941.1819	4.7916		23,060.9726
Total	**3.6627**	**59.1819**	**119.0781**	**0.2391**		**0.3653**	**0.3653**		**0.3653**	**0.3653**	**0.0000**	**22,941.1819**	**22,941.1819**	**4.7916**		**23,060.9726**

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	0.1042	3.5581	0.7119	0.0178	0.6659	0.0427	0.7085	0.1915	0.0408	0.2323		1,881.3773	1,881.3773	0.0105	0.2710	1,962.3909
Worker	0.3798	0.3770	4.5704	0.0118	1.3678	8.2700e-003	1.3761	0.3626	7.6100e-003	0.3702		1,198.7335	1,198.7335	0.0272	0.0326	1,209.1191
Total	**0.4840**	**3.9351**	**5.2823**	**0.0296**	**2.0337**	**0.0509**	**2.0846**	**0.5541**	**0.0484**	**0.6025**		**3,080.1108**	**3,080.1108**	**0.0377**	**0.3036**	**3,171.5099**

3.4 Well Construction - 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

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AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

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

Category	lb/day										lb/day					
Off-Road	6.1219	50.0154	47.1875	0.2382		1.6208	1.6208		1.5412	1.5412		22,858.9137	22,858.9137	4.7494		22,977.6477
Total	**6.1219**	**50.0154**	**47.1875**	**0.2382**		**1.6208**	**1.6208**		**1.5412**	**1.5412**		**22,858.9137**	**22,858.9137**	**4.7494**		**22,977.6477**

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	0.0443	2.7681	0.5153	0.0171	0.6659	0.0173	0.6832	0.1915	0.0166	0.2080		1,807.1454	1,807.1454	7.4300e-003	0.2589	1,884.4833
Worker	0.3521	0.3309	4.1572	0.0114	1.3678	7.8000e-003	1.3756	0.3626	7.1800e-003	0.3698		1,168.2211	1,168.2211	0.0241	0.0297	1,177.6720
Total	**0.3964**	**3.0990**	**4.6725**	**0.0285**	**2.0337**	**0.0251**	**2.0588**	**0.5541**	**0.0238**	**0.5778**		**2,975.3665**	**2,975.3665**	**0.0315**	**0.2886**	**3,062.1553**

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	3.6627	59.1819	119.0781	0.2382		0.3653	0.3653		0.3653	0.3653	0.0000	22,858.9136	22,858.9136	4.7494		22,977.6477

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

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

Total	**3.6627**	**59.1819**	**119.0781**	**0.2382**		**0.3653**	**0.3653**		**0.3653**	**0.3653**	**0.0000**	**22,858.9136**	**22,858.9136**	**4.7494**		**22,977.6477**

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	0.0443	2.7681	0.5153	0.0171	0.6659	0.0173	0.6832	0.1915	0.0166	0.2080		1,807.1454	1,807.1454	7.4300e-003	0.2589	1,884.4833
Worker	0.3521	0.3309	4.1572	0.0114	1.3678	7.8000e-003	1.3756	0.3626	7.1800e-003	0.3698		1,168.2211	1,168.2211	0.0241	0.0297	1,177.6720
Total	**0.3964**	**3.0990**	**4.6725**	**0.0285**	**2.0337**	**0.0251**	**2.0588**	**0.5541**	**0.0238**	**0.5778**		**2,975.3665**	**2,975.3665**	**0.0315**	**0.2886**	**3,062.1553**

3.4 Well Construction - 2024

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	6.0111	46.1675	47.2375	0.2384		1.4864	1.4864		1.4101	1.4101		22,871.1321	22,871.1321	4.7533		22,989.9647
Total	**6.0111**	**46.1675**	**47.2375**	**0.2384**		**1.4864**	**1.4864**		**1.4101**	**1.4101**		**22,871.1321**	**22,871.1321**	**4.7533**		**22,989.9647**

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AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

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

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	0.0423	2.6911	0.4808	0.0168	0.6659	0.0188	0.6847	0.1915	0.0180	0.2094		1,767.6799	1,767.6799	7.1200e-003	0.2524	1,843.0839
Worker	0.3270	0.2916	3.7164	0.0111	1.3678	7.3500e-003	1.3751	0.3626	6.7700e-003	0.3694		1,146.7500	1,146.7500	0.0213	0.0272	1,155.3826
Total	**0.3693**	**2.9827**	**4.1972**	**0.0279**	**2.0337**	**0.0261**	**2.0598**	**0.5541**	**0.0247**	**0.5788**		**2,914.4299**	**2,914.4299**	**0.0284**	**0.2796**	**2,998.4665**

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	3.6627	59.1819	119.0781	0.2384		0.3653	0.3653		0.3653	0.3653	0.0000	22,871.1320	22,871.1320	4.7533		22,989.9647
Total	**3.6627**	**59.1819**	**119.0781**	**0.2384**		**0.3653**	**0.3653**		**0.3653**	**0.3653**	**0.0000**	**22,871.1320**	**22,871.1320**	**4.7533**		**22,989.9647**

Mitigated Construction Off-Site

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AVEK - Recovery Facilities - Antelope Valley APCD Air District, 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	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	0.0423	2.6911	0.4808	0.0168	0.6659	0.0188	0.6847	0.1915	0.0180	0.2094		1,767.6799	1,767.6799	7.1200e-003	0.2524	1,843.0839
Worker	0.3270	0.2916	3.7164	0.0111	1.3678	7.3500e-003	1.3751	0.3626	6.7700e-003	0.3694		1,146.7500	1,146.7500	0.0213	0.0272	1,155.3826
Total	**0.3693**	**2.9827**	**4.1972**	**0.0279**	**2.0337**	**0.0261**	**2.0598**	**0.5541**	**0.0247**	**0.5788**		**2,914.4299**	**2,914.4299**	**0.0284**	**0.2796**	**2,998.4665**

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

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

AVEK - Recovery Facilities

Antelope Valley APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	6.50	Acre	6.50	283,140.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Proposed Extraction Wells/Recovery [Recovery Facilities, Table 2.4-4]

Land Use - Per AVEK Project Description, 6.5 acres for this phase

Construction Phase - Per project schedule, estimated construction is from December 2021 through April 2024.

Off-road Equipment - Per AVEK AECOM Technical AQ Memo -
2 grader (174 hp, 6 hours per day)
2 wheeled loaders (313 hp; 1 hour per day)
1 water truck (200 hp, 1 hour per day)

Off-road Equipment - Per AVEK AECOM Technical AQ Memo -
2 hydraulic excavators (180 hp, 6 hours per day)

Off-road Equipment - Per AVEK AECOM Technical AQ Memo -
2 drilling rigs (500 HP, 24 hrs per day for 90 days)
2 off-highway trucks (479 hp, 4 hours per day)
2 Test pumps (200 hp, 60 hrs per well)
2 skip loader (88 hp, 1 hour per day)
2 small roller compactor (114 hp, 1 hour per day)

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AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

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

Construction Off-road Equipment Mitigation - Per AVEK AECOM 2017 technical memorandum, AQ-1 mitigation measure applied.

Grading - Excess spoil from excavation operations will incorporated into the recharge basin berms and thus will not be hauled off site.

Trips and VMT - Per the project description, 60 worker trips and 12 vendor trips per day at 60 miles in length.

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstructionPhase	NumDays	230.00	630.00
tblConstructionPhase	NumDays	20.00	630.00
tblConstructionPhase	PhaseEndDate	11/15/2022	4/30/2024
tblConstructionPhase	PhaseEndDate	12/28/2021	4/30/2024
tblConstructionPhase	PhaseEndDate	12/28/2021	4/30/2024
tblConstructionPhase	PhaseStartDate	12/29/2021	12/1/2021
tblConstructionPhase	PhaseStartDate	12/29/2021	12/1/2021
tblGrading	AcresOfGrading	472.50	6.50
tblOffRoadEquipment	HorsePower	402.00	479.00

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tblOffRoadEquipment	HorsePower	97.00	313.00
tblOffRoadEquipment	HorsePower	158.00	180.00
tblOffRoadEquipment	HorsePower	221.00	500.00
tblOffRoadEquipment	HorsePower	402.00	479.00
tblOffRoadEquipment	HorsePower	84.00	200.00
tblOffRoadEquipment	HorsePower	65.00	88.00
tblOffRoadEquipment	HorsePower	80.00	114.00
tblOffRoadEquipment	HorsePower	187.00	174.00
tblOffRoadEquipment	LoadFactor	0.37	0.41
tblOffRoadEquipment	LoadFactor	0.37	0.37
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	OffRoadEquipmentType		Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Rollers
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripLength	6.60	60.00
tblTripsAndVMT	VendorTripLength	6.60	60.00
tblTripsAndVMT	VendorTripLength	6.60	60.00
tblTripsAndVMT	VendorTripNumber	46.00	12.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripNumber	13.00	20.00
tblTripsAndVMT	WorkerTripNumber	5.00	10.00
tblTripsAndVMT	WorkerTripNumber	119.00	30.00

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

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.1109	1.0226	0.8266	3.5900e-003	0.0418	0.0349	0.0767	0.0107	0.0329	0.0436	0.0000	315.7532	315.7532	0.0606	3.7100e-003	318.3741
2022	1.1411	9.7520	9.0369	0.0403	0.4372	0.3306	0.7679	0.1175	0.3117	0.4292	0.0000	3,546.6429	3,546.6429	0.6792	0.0400	3,575.5405
2023	1.0647	8.4802	8.8144	0.0400	0.4372	0.2855	0.7227	0.1175	0.2692	0.3867	0.0000	3,520.8282	3,520.8282	0.6731	0.0379	3,548.9369
2024	0.3467	2.6185	2.9063	0.0133	0.1486	0.0876	0.2362	0.0396	0.0825	0.1221	0.0000	1,175.3377	1,175.3377	0.2252	0.0122	1,184.6036
Maximum	**1.1411**	**9.7520**	**9.0369**	**0.0403**	**0.4372**	**0.3306**	**0.7679**	**0.1175**	**0.3117**	**0.4292**	**0.0000**	**3,546.6429**	**3,546.6429**	**0.6792**	**0.0400**	**3,575.5405**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0579	0.8487	1.7048	3.5900e-003	0.0418	5.8600e-003	0.0477	0.0107	5.8100e-003	0.0165	0.0000	315.7529	315.7529	0.0606	3.7100e-003	318.3738
2022	0.6365	9.4609	19.1026	0.0403	0.4372	0.0613	0.4985	0.1175	0.0609	0.1784	0.0000	3,546.6393	3,546.6393	0.6792	0.0400	3,575.5369
2023	0.6219	9.3438	18.9618	0.0400	0.4372	0.0579	0.4951	0.1175	0.0576	0.1751	0.0000	3,520.8246	3,520.8246	0.6731	0.0379	3,548.9332

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2024	0.2059	3.1196	6.3021	0.0133	0.1486	0.0194	0.1680	0.0396	0.0193	0.0589	0.0000	1,175.3365	1,175.3365	0.2252	0.0122	1,184.6024
Maximum	**0.6365**	**9.4609**	**19.1026**	**0.0403**	**0.4372**	**0.0613**	**0.4985**	**0.1175**	**0.0609**	**0.1784**	**0.0000**	**3,546.6393**	**3,546.6393**	**0.6792**	**0.0400**	**3,575.5369**

	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	**42.85**	**-4.11**	**-113.45**	**0.00**	**0.00**	**80.45**	**32.95**	**0.00**	**79.38**	**56.31**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**12-1-2021**	**2-28-2022**	2.8557	2.5084
2	**3-1-2022**	**5-31-2022**	2.7477	2.5466
3	**6-1-2022**	**8-31-2022**	2.7454	2.5443
4	**9-1-2022**	**11-30-2022**	2.7201	2.5212
5	**12-1-2022**	**2-28-2023**	2.4743	2.4747
6	**3-1-2023**	**5-31-2023**	2.4083	2.5146
7	**6-1-2023**	**8-31-2023**	2.4064	2.5127
8	**9-1-2023**	**11-30-2023**	2.3840	2.4892
9	**12-1-2023**	**2-29-2024**	2.2733	2.4866
10	**3-1-2024**	**5-31-2024**	1.4831	1.6635
		Highest	2.8557	2.5466

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	12/1/2021	4/30/2024	5	630	
2	Trenching	Trenching	12/1/2021	4/30/2024	5	630	
3	Well Construction	Building Construction	12/1/2021	4/30/2024	5	630	

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Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 6.5

Acres of Paving: 6.5

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
Grading	Off-Highway Trucks	1	4.00	479	0.38
Grading	Tractors/Loaders/Backhoes	2	1.00	313	0.41
Trenching	Excavators	2	6.00	180	0.38
Well Construction	Bore/Drill Rigs	2	24.00	500	0.50
Well Construction	Off-Highway Trucks	2	4.00	479	0.38
Well Construction	Pumps	2	24.00	200	0.74
Well Construction	Skid Steer Loaders	2	1.00	88	0.37
Well Construction	Rollers	2	1.00	114	0.38
Grading	Graders	2	6.00	174	0.41

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
Grading	5	20.00	0.00	0.00	60.00	60.00	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	2	10.00	0.00	0.00	60.00	60.00	20.00	LD_Mix	HDT_Mix	HHDT
Well Construction	10	30.00	12.00	0.00	60.00	60.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Grading - 2021

Unmitigated Construction On-Site

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.4500e-003	0.0000	3.4500e-003	3.7000e-004	0.0000	3.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0163	0.1527	0.1107	2.3000e-004		7.6000e-003	7.6000e-003		6.9900e-003	6.9900e-003	0.0000	20.1391	20.1391	6.5100e-003	0.0000	20.3020
Total	**0.0163**	**0.1527**	**0.1107**	**2.3000e-004**	**3.4500e-003**	**7.6000e-003**	**0.0111**	**3.7000e-004**	**6.9900e-003**	**7.3600e-003**	**0.0000**	**20.1391**	**20.1391**	**6.5100e-003**	**0.0000**	**20.3020**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9000e-003	3.5100e-003	0.0416	1.0000e-004	0.0103	7.0000e-005	0.0104	2.7300e-003	6.0000e-005	2.7900e-003	0.0000	8.8052	8.8052	2.2000e-004	2.6000e-004	8.8886
Total	**2.9000e-003**	**3.5100e-003**	**0.0416**	**1.0000e-004**	**0.0103**	**7.0000e-005**	**0.0104**	**2.7300e-003**	**6.0000e-005**	**2.7900e-003**	**0.0000**	**8.8052**	**8.8052**	**2.2000e-004**	**2.6000e-004**	**8.8886**

Mitigated Construction On-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

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	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.4500e-003	0.0000	3.4500e-003	3.7000e-004	0.0000	3.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.3000e-003	0.0789	0.1452	2.3000e-004		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004	0.0000	20.1391	20.1391	6.5100e-003	0.0000	20.3020
Total	**3.3000e-003**	**0.0789**	**0.1452**	**2.3000e-004**	**3.4500e-003**	**3.7000e-004**	**3.8200e-003**	**3.7000e-004**	**3.7000e-004**	**7.4000e-004**	**0.0000**	**20.1391**	**20.1391**	**6.5100e-003**	**0.0000**	**20.3020**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9000e-003	3.5100e-003	0.0416	1.0000e-004	0.0103	7.0000e-005	0.0104	2.7300e-003	6.0000e-005	2.7900e-003	0.0000	8.8052	8.8052	2.2000e-004	2.6000e-004	8.8886
Total	**2.9000e-003**	**3.5100e-003**	**0.0416**	**1.0000e-004**	**0.0103**	**7.0000e-005**	**0.0104**	**2.7300e-003**	**6.0000e-005**	**2.7900e-003**	**0.0000**	**8.8052**	**8.8052**	**2.2000e-004**	**2.6000e-004**	**8.8886**

3.2 Grading - 2022

Unmitigated Construction On-Site

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.4500e-003	0.0000	3.4500e-003	3.7000e-004	0.0000	3.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1608	1.4286	1.2113	2.5900e-003		0.0715	0.0715		0.0657	0.0657	0.0000	227.6976	227.6976	0.0736	0.0000	229.5386
Total	**0.1608**	**1.4286**	**1.2113**	**2.5900e-003**	**3.4500e-003**	**0.0715**	**0.0749**	**3.7000e-004**	**0.0657**	**0.0661**	**0.0000**	**227.6976**	**227.6976**	**0.0736**	**0.0000**	**229.5386**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0303	0.0347	0.4258	1.0500e-003	0.1162	7.2000e-004	0.1169	0.0309	6.6000e-004	0.0315	0.0000	96.9365	96.9365	2.2000e-003	2.6800e-003	97.7896
Total	**0.0303**	**0.0347**	**0.4258**	**1.0500e-003**	**0.1162**	**7.2000e-004**	**0.1169**	**0.0309**	**6.6000e-004**	**0.0315**	**0.0000**	**96.9365**	**96.9365**	**2.2000e-003**	**2.6800e-003**	**97.7896**

Mitigated Construction On-Site

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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	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.4500e-003	0.0000	3.4500e-003	3.7000e-004	0.0000	3.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0373	0.8916	1.6416	2.5900e-003		4.2200e-003	4.2200e-003		4.2200e-003	4.2200e-003	0.0000	227.6973	227.6973	0.0736	0.0000	229.5384
Total	**0.0373**	**0.8916**	**1.6416**	**2.5900e-003**	**3.4500e-003**	**4.2200e-003**	**7.6700e-003**	**3.7000e-004**	**4.2200e-003**	**4.5900e-003**	**0.0000**	**227.6973**	**227.6973**	**0.0736**	**0.0000**	**229.5384**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0303	0.0347	0.4258	1.0500e-003	0.1162	7.2000e-004	0.1169	0.0309	6.6000e-004	0.0315	0.0000	96.9365	96.9365	2.2000e-003	2.6800e-003	97.7896
Total	**0.0303**	**0.0347**	**0.4258**	**1.0500e-003**	**0.1162**	**7.2000e-004**	**0.1169**	**0.0309**	**6.6000e-004**	**0.0315**	**0.0000**	**96.9365**	**96.9365**	**2.2000e-003**	**2.6800e-003**	**97.7896**

3.2 Grading - 2023

Unmitigated Construction On-Site

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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	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.4500e-003	0.0000	3.4500e-003	3.7000e-004	0.0000	3.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1459	1.2386	1.1953	2.5900e-003		0.0614	0.0614		0.0565	0.0565	0.0000	227.7519	227.7519	0.0737	0.0000	229.5934
Total	**0.1459**	**1.2386**	**1.1953**	**2.5900e-003**	**3.4500e-003**	**0.0614**	**0.0648**	**3.7000e-004**	**0.0565**	**0.0569**	**0.0000**	**227.7519**	**227.7519**	**0.0737**	**0.0000**	**229.5934**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0280	0.0305	0.3873	1.0200e-003	0.1162	6.8000e-004	0.1169	0.0309	6.2000e-004	0.0315	0.0000	94.4597	94.4597	1.9500e-003	2.4400e-003	95.2359
Total	**0.0280**	**0.0305**	**0.3873**	**1.0200e-003**	**0.1162**	**6.8000e-004**	**0.1169**	**0.0309**	**6.2000e-004**	**0.0315**	**0.0000**	**94.4597**	**94.4597**	**1.9500e-003**	**2.4400e-003**	**95.2359**

Mitigated Construction On-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

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	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.4500e-003	0.0000	3.4500e-003	3.7000e-004	0.0000	3.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0373	0.8916	1.6416	2.5900e-003		4.2200e-003	4.2200e-003		4.2200e-003	4.2200e-003	0.0000	227.7517	227.7517	0.0737	0.0000	229.5932
Total	**0.0373**	**0.8916**	**1.6416**	**2.5900e-003**	**3.4500e-003**	**4.2200e-003**	**7.6700e-003**	**3.7000e-004**	**4.2200e-003**	**4.5900e-003**	**0.0000**	**227.7517**	**227.7517**	**0.0737**	**0.0000**	**229.5932**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0280	0.0305	0.3873	1.0200e-003	0.1162	6.8000e-004	0.1169	0.0309	6.2000e-004	0.0315	0.0000	94.4597	94.4597	1.9500e-003	2.4400e-003	95.2359
Total	**0.0280**	**0.0305**	**0.3873**	**1.0200e-003**	**0.1162**	**6.8000e-004**	**0.1169**	**0.0309**	**6.2000e-004**	**0.0315**	**0.0000**	**94.4597**	**94.4597**	**1.9500e-003**	**2.4400e-003**	**95.2359**

3.2 Grading - 2024

Unmitigated Construction On-Site

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AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

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	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.4500e-003	0.0000	3.4500e-003	3.7000e-004	0.0000	3.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0465	0.3778	0.3975	8.7000e-004		0.0187	0.0187		0.0172	0.0172	0.0000	76.2365	76.2365	0.0247	0.0000	76.8529
Total	**0.0465**	**0.3778**	**0.3975**	**8.7000e-004**	**3.4500e-003**	**0.0187**	**0.0222**	**3.7000e-004**	**0.0172**	**0.0176**	**0.0000**	**76.2365**	**76.2365**	**0.0247**	**0.0000**	**76.8529**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.6600e-003	8.9900e-003	0.1158	3.3000e-004	0.0389	2.1000e-004	0.0391	0.0103	2.0000e-004	0.0105	0.0000	31.0230	31.0230	5.8000e-004	7.5000e-004	31.2602
Total	**8.6600e-003**	**8.9900e-003**	**0.1158**	**3.3000e-004**	**0.0389**	**2.1000e-004**	**0.0391**	**0.0103**	**2.0000e-004**	**0.0105**	**0.0000**	**31.0230**	**31.0230**	**5.8000e-004**	**7.5000e-004**	**31.2602**

Mitigated Construction On-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

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	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.4500e-003	0.0000	3.4500e-003	3.7000e-004	0.0000	3.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0125	0.2983	0.5493	8.7000e-004		1.4100e-003	1.4100e-003		1.4100e-003	1.4100e-003	0.0000	76.2364	76.2364	0.0247	0.0000	76.8528
Total	**0.0125**	**0.2983**	**0.5493**	**8.7000e-004**	**3.4500e-003**	**1.4100e-003**	**4.8600e-003**	**3.7000e-004**	**1.4100e-003**	**1.7800e-003**	**0.0000**	**76.2364**	**76.2364**	**0.0247**	**0.0000**	**76.8528**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.6600e-003	8.9900e-003	0.1158	3.3000e-004	0.0389	2.1000e-004	0.0391	0.0103	2.0000e-004	0.0105	0.0000	31.0230	31.0230	5.8000e-004	7.5000e-004	31.2602
Total	**8.6600e-003**	**8.9900e-003**	**0.1158**	**3.3000e-004**	**0.0389**	**2.1000e-004**	**0.0391**	**0.0103**	**2.0000e-004**	**0.0105**	**0.0000**	**31.0230**	**31.0230**	**5.8000e-004**	**7.5000e-004**	**31.2602**

3.3 Trenching - 2021

Unmitigated Construction On-Site

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AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

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	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.3900e-003	0.0355	0.0230	1.0000e-004		1.0900e-003	1.0900e-003		1.0000e-003	1.0000e-003	0.0000	8.9067	8.9067	2.8800e-003	0.0000	8.9787
Total	**3.3900e-003**	**0.0355**	**0.0230**	**1.0000e-004**		**1.0900e-003**	**1.0900e-003**		**1.0000e-003**	**1.0000e-003**	**0.0000**	**8.9067**	**8.9067**	**2.8800e-003**	**0.0000**	**8.9787**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4500e-003	1.7600e-003	0.0208	5.0000e-005	5.1400e-003	3.0000e-005	5.1700e-003	1.3600e-003	3.0000e-005	1.4000e-003	0.0000	4.4026	4.4026	1.1000e-004	1.3000e-004	4.4443
Total	**1.4500e-003**	**1.7600e-003**	**0.0208**	**5.0000e-005**	**5.1400e-003**	**3.0000e-005**	**5.1700e-003**	**1.3600e-003**	**3.0000e-005**	**1.4000e-003**	**0.0000**	**4.4026**	**4.4026**	**1.1000e-004**	**1.3000e-004**	**4.4443**

Mitigated Construction On-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

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	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.6600e-003	0.0268	0.0541	1.0000e-004		1.7000e-004	1.7000e-004		1.7000e-004	1.7000e-004	0.0000	8.9067	8.9067	2.8800e-003	0.0000	8.9787
Total	**1.6600e-003**	**0.0268**	**0.0541**	**1.0000e-004**		**1.7000e-004**	**1.7000e-004**		**1.7000e-004**	**1.7000e-004**	**0.0000**	**8.9067**	**8.9067**	**2.8800e-003**	**0.0000**	**8.9787**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4500e-003	1.7600e-003	0.0208	5.0000e-005	5.1400e-003	3.0000e-005	5.1700e-003	1.3600e-003	3.0000e-005	1.4000e-003	0.0000	4.4026	4.4026	1.1000e-004	1.3000e-004	4.4443
Total	**1.4500e-003**	**1.7600e-003**	**0.0208**	**5.0000e-005**	**5.1400e-003**	**3.0000e-005**	**5.1700e-003**	**1.3600e-003**	**3.0000e-005**	**1.4000e-003**	**0.0000**	**4.4026**	**4.4026**	**1.1000e-004**	**1.3000e-004**	**4.4443**

3.3 Trenching - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

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

Off-Road	0.0349	0.3261	0.2568	1.1500e-003		0.0102	0.0102		9.4200e-003	9.4200e-003	0.0000	100.7374	100.7374	0.0326	0.0000	101.5519
Total	**0.0349**	**0.3261**	**0.2568**	**1.1500e-003**		**0.0102**	**0.0102**		**9.4200e-003**	**9.4200e-003**	**0.0000**	**100.7374**	**100.7374**	**0.0326**	**0.0000**	**101.5519**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0151	0.0174	0.2129	5.3000e-004	0.0581	3.6000e-004	0.0585	0.0154	3.3000e-004	0.0158	0.0000	48.4683	48.4683	1.1000e-003	1.3400e-003	48.8948
Total	**0.0151**	**0.0174**	**0.2129**	**5.3000e-004**	**0.0581**	**3.6000e-004**	**0.0585**	**0.0154**	**3.3000e-004**	**0.0158**	**0.0000**	**48.4683**	**48.4683**	**1.1000e-003**	**1.3400e-003**	**48.8948**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0188	0.3035	0.6116	1.1500e-003		1.8800e-003	1.8800e-003		1.8800e-003	1.8800e-003	0.0000	100.7373	100.7373	0.0326	0.0000	101.5518
Total	**0.0188**	**0.3035**	**0.6116**	**1.1500e-003**		**1.8800e-003**	**1.8800e-003**		**1.8800e-003**	**1.8800e-003**	**0.0000**	**100.7373**	**100.7373**	**0.0326**	**0.0000**	**101.5518**

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

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

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0151	0.0174	0.2129	5.3000e-004	0.0581	3.6000e-004	0.0585	0.0154	3.3000e-004	0.0158	0.0000	48.4683	48.4683	1.1000e-003	1.3400e-003	48.8948
Total	**0.0151**	**0.0174**	**0.2129**	**5.3000e-004**	**0.0581**	**3.6000e-004**	**0.0585**	**0.0154**	**3.3000e-004**	**0.0158**	**0.0000**	**48.4683**	**48.4683**	**1.1000e-003**	**1.3400e-003**	**48.8948**

3.3 Trenching - 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	tons/yr										MT/yr					
Off-Road	0.0334	0.2845	0.2563	1.1500e-003		9.1100e-003	9.1100e-003		8.3800e-003	8.3800e-003	0.0000	100.7741	100.7741	0.0326	0.0000	101.5889
Total	**0.0334**	**0.2845**	**0.2563**	**1.1500e-003**		**9.1100e-003**	**9.1100e-003**		**8.3800e-003**	**8.3800e-003**	**0.0000**	**100.7741**	**100.7741**	**0.0326**	**0.0000**	**101.5889**

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

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0140	0.0152	0.1936	5.1000e-004	0.0581	3.4000e-004	0.0584	0.0154	3.1000e-004	0.0157	0.0000	47.2298	47.2298	9.7000e-004	1.2200e-003	47.6180
Total	**0.0140**	**0.0152**	**0.1936**	**5.1000e-004**	**0.0581**	**3.4000e-004**	**0.0584**	**0.0154**	**3.1000e-004**	**0.0157**	**0.0000**	**47.2298**	**47.2298**	**9.7000e-004**	**1.2200e-003**	**47.6180**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0188	0.3035	0.6116	1.1500e-003		1.8800e-003	1.8800e-003		1.8800e-003	1.8800e-003	0.0000	100.7739	100.7739	0.0326	0.0000	101.5887
Total	**0.0188**	**0.3035**	**0.6116**	**1.1500e-003**		**1.8800e-003**	**1.8800e-003**		**1.8800e-003**	**1.8800e-003**	**0.0000**	**100.7739**	**100.7739**	**0.0326**	**0.0000**	**101.5887**

Mitigated Construction Off-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

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	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0140	0.0152	0.1936	5.1000e-004	0.0581	3.4000e-004	0.0584	0.0154	3.1000e-004	0.0157	0.0000	47.2298	47.2298	9.7000e-004	1.2200e-003	47.6180
Total	**0.0140**	**0.0152**	**0.1936**	**5.1000e-004**	**0.0581**	**3.4000e-004**	**0.0584**	**0.0154**	**3.1000e-004**	**0.0157**	**0.0000**	**47.2298**	**47.2298**	**9.7000e-004**	**1.2200e-003**	**47.6180**

3.3 Trenching - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0109	0.0872	0.0858	3.8000e-004		2.8200e-003	2.8200e-003		2.5900e-003	2.5900e-003	0.0000	33.7369	33.7369	0.0109	0.0000	34.0096
Total	**0.0109**	**0.0872**	**0.0858**	**3.8000e-004**		**2.8200e-003**	**2.8200e-003**		**2.5900e-003**	**2.5900e-003**	**0.0000**	**33.7369**	**33.7369**	**0.0109**	**0.0000**	**34.0096**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

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

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.3300e-003	4.4900e-003	0.0579	1.7000e-004	0.0194	1.1000e-004	0.0196	5.1600e-003	1.0000e-004	5.2600e-003	0.0000	15.5115	15.5115	2.9000e-004	3.7000e-004	15.6301
Total	**4.3300e-003**	**4.4900e-003**	**0.0579**	**1.7000e-004**	**0.0194**	**1.1000e-004**	**0.0196**	**5.1600e-003**	**1.0000e-004**	**5.2600e-003**	**0.0000**	**15.5115**	**15.5115**	**2.9000e-004**	**3.7000e-004**	**15.6301**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.3000e-003	0.1015	0.2047	3.8000e-004		6.3000e-004	6.3000e-004		6.3000e-004	6.3000e-004	0.0000	33.7368	33.7368	0.0109	0.0000	34.0096
Total	**6.3000e-003**	**0.1015**	**0.2047**	**3.8000e-004**		**6.3000e-004**	**6.3000e-004**		**6.3000e-004**	**6.3000e-004**	**0.0000**	**33.7368**	**33.7368**	**0.0109**	**0.0000**	**34.0096**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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

Worker	4.3300e-003	4.4900e-003	0.0579	1.7000e-004	0.0194	1.1000e-004	0.0196	5.1600e-003	1.0000e-004	5.2600e-003	0.0000	15.5115	15.5115	2.9000e-004	3.7000e-004	15.6301
Total	**4.3300e-003**	**4.4900e-003**	**0.0579**	**1.7000e-004**	**0.0194**	**1.1000e-004**	**0.0196**	**5.1600e-003**	**1.0000e-004**	**5.2600e-003**	**0.0000**	**15.5115**	**15.5115**	**2.9000e-004**	**3.7000e-004**	**15.6301**

3.4 Well Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0805	0.7720	0.5568	2.7600e-003		0.0251	0.0251		0.0238	0.0238	0.0000	240.0543	240.0543	0.0504	0.0000	241.3140
Total	**0.0805**	**0.7720**	**0.5568**	**2.7600e-003**		**0.0251**	**0.0251**		**0.0238**	**0.0238**	**0.0000**	**240.0543**	**240.0543**	**0.0504**	**0.0000**	**241.3140**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.0500e-003	0.0519	0.0112	2.1000e-004	7.5300e-003	9.2000e-004	8.4500e-003	2.1700e-003	8.8000e-004	3.0500e-003	0.0000	20.2373	20.2373	1.5000e-004	2.9300e-003	21.1138
Worker	4.3500e-003	5.2700e-003	0.0625	1.4000e-004	0.0154	1.0000e-004	0.0155	4.0900e-003	9.0000e-005	4.1900e-003	0.0000	13.2079	13.2079	3.3000e-004	3.9000e-004	13.3328
Total	**6.4000e-003**	**0.0572**	**0.0737**	**3.5000e-004**	**0.0230**	**1.0200e-003**	**0.0240**	**6.2600e-003**	**9.7000e-004**	**7.2400e-003**	**0.0000**	**33.4452**	**33.4452**	**4.8000e-004**	**3.3200e-003**	**34.4467**

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AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

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

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0421	0.6806	1.3694	2.7600e-003		4.2000e-003	4.2000e-003		4.2000e-003	4.2000e-003	0.0000	240.0541	240.0541	0.0504	0.0000	241.3137
Total	**0.0421**	**0.6806**	**1.3694**	**2.7600e-003**		**4.2000e-003**	**4.2000e-003**		**4.2000e-003**	**4.2000e-003**	**0.0000**	**240.0541**	**240.0541**	**0.0504**	**0.0000**	**241.3137**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.0500e-003	0.0519	0.0112	2.1000e-004	7.5300e-003	9.2000e-004	8.4500e-003	2.1700e-003	8.8000e-004	3.0500e-003	0.0000	20.2373	20.2373	1.5000e-004	2.9300e-003	21.1138
Worker	4.3500e-003	5.2700e-003	0.0625	1.4000e-004	0.0154	1.0000e-004	0.0155	4.0900e-003	9.0000e-005	4.1900e-003	0.0000	13.2079	13.2079	3.3000e-004	3.9000e-004	13.3328
Total	**6.4000e-003**	**0.0572**	**0.0737**	**3.5000e-004**	**0.0230**	**1.0200e-003**	**0.0240**	**6.2600e-003**	**9.7000e-004**	**7.2400e-003**	**0.0000**	**33.4452**	**33.4452**	**4.8000e-004**	**3.3200e-003**	**34.4467**

3.4 Well Construction - 2022

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AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

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

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.8411	7.4250	6.1995	0.0311		0.2413	0.2413		0.2293	0.2293	0.0000	2,705.5457	2,705.5457	0.5651	0.0000	2,719.6731
Total	**0.8411**	**7.4250**	**6.1995**	**0.0311**		**0.2413**	**0.2413**		**0.2293**	**0.2293**	**0.0000**	**2,705.5457**	**2,705.5457**	**0.5651**	**0.0000**	**2,719.6731**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0135	0.4680	0.0920	2.3200e-003	0.0852	5.5500e-003	0.0907	0.0246	5.3000e-003	0.0299	0.0000	221.8527	221.8527	1.2400e-003	0.0320	231.4081
Worker	0.0454	0.0521	0.6386	1.5800e-003	0.1743	1.0700e-003	0.1754	0.0463	9.9000e-004	0.0473	0.0000	145.4048	145.4048	3.3000e-003	4.0200e-003	146.6844
Total	**0.0589**	**0.5201**	**0.7306**	**3.9000e-003**	**0.2595**	**6.6200e-003**	**0.2661**	**0.0708**	**6.2900e-003**	**0.0771**	**0.0000**	**367.2575**	**367.2575**	**4.5400e-003**	**0.0360**	**378.0925**

Mitigated Construction On-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

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	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4762	7.6936	15.4801	0.0311		0.0475	0.0475		0.0475	0.0475	0.0000	2,705.5425	2,705.5425	0.5651	0.0000	2,719.6699
Total	**0.4762**	**7.6936**	**15.4801**	**0.0311**		**0.0475**	**0.0475**		**0.0475**	**0.0475**	**0.0000**	**2,705.5425**	**2,705.5425**	**0.5651**	**0.0000**	**2,719.6699**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0135	0.4680	0.0920	2.3200e-003	0.0852	5.5500e-003	0.0907	0.0246	5.3000e-003	0.0299	0.0000	221.8527	221.8527	1.2400e-003	0.0320	231.4081
Worker	0.0454	0.0521	0.6386	1.5800e-003	0.1743	1.0700e-003	0.1754	0.0463	9.9000e-004	0.0473	0.0000	145.4048	145.4048	3.3000e-003	4.0200e-003	146.6844
Total	**0.0589**	**0.5201**	**0.7306**	**3.9000e-003**	**0.2595**	**6.6200e-003**	**0.2661**	**0.0708**	**6.2900e-003**	**0.0771**	**0.0000**	**367.2575**	**367.2575**	**4.5400e-003**	**0.0360**	**378.0925**

3.4 Well Construction - 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	tons/yr										MT/yr					

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

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

Off-Road	0.7959	6.5020	6.1344	0.0310		0.2107	0.2107		0.2004	0.2004	0.0000	2,695.8435	2,695.8435	0.5601	0.0000	2,709.8463
Total	**0.7959**	**6.5020**	**6.1344**	**0.0310**		**0.2107**	**0.2107**		**0.2004**	**0.2004**	**0.0000**	**2,695.8435**	**2,695.8435**	**0.5601**	**0.0000**	**2,709.8463**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.7200e-003	0.3637	0.0666	2.2300e-003	0.0852	2.2500e-003	0.0874	0.0246	2.1500e-003	0.0267	0.0000	213.0797	213.0797	8.8000e-004	0.0305	222.2005
Worker	0.0419	0.0457	0.5809	1.5300e-003	0.1743	1.0100e-003	0.1753	0.0463	9.3000e-004	0.0472	0.0000	141.6895	141.6895	2.9200e-003	3.6600e-003	142.8539
Total	**0.0477**	**0.4094**	**0.6475**	**3.7600e-003**	**0.2595**	**3.2600e-003**	**0.2628**	**0.0708**	**3.0800e-003**	**0.0739**	**0.0000**	**354.7692**	**354.7692**	**3.8000e-003**	**0.0342**	**365.0544**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4762	7.6936	15.4801	0.0310		0.0475	0.0475		0.0475	0.0475	0.0000	2,695.8403	2,695.8403	0.5601	0.0000	2,709.8431
Total	**0.4762**	**7.6936**	**15.4801**	**0.0310**		**0.0475**	**0.0475**		**0.0475**	**0.0475**	**0.0000**	**2,695.8403**	**2,695.8403**	**0.5601**	**0.0000**	**2,709.8431**

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

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.7200e-003	0.3637	0.0666	2.2300e-003	0.0852	2.2500e-003	0.0874	0.0246	2.1500e-003	0.0267	0.0000	213.0797	213.0797	8.8000e-004	0.0305	222.2005
Worker	0.0419	0.0457	0.5809	1.5300e-003	0.1743	1.0100e-003	0.1753	0.0463	9.3000e-004	0.0472	0.0000	141.6895	141.6895	2.9200e-003	3.6600e-003	142.8539
Total	**0.0477**	**0.4094**	**0.6475**	**3.7600e-003**	**0.2595**	**3.2600e-003**	**0.2628**	**0.0708**	**3.0800e-003**	**0.0739**	**0.0000**	**354.7692**	**354.7692**	**3.8000e-003**	**0.0342**	**365.0544**

3.4 Well Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2615	2.0083	2.0548	0.0104		0.0647	0.0647		0.0613	0.0613	0.0000	902.5529	902.5529	0.1876	0.0000	907.2423
Total	**0.2615**	**2.0083**	**2.0548**	**0.0104**		**0.0647**	**0.0647**		**0.0613**	**0.0613**	**0.0000**	**902.5529**	**902.5529**	**0.1876**	**0.0000**	**907.2423**

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

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.8300e-003	0.1183	0.0208	7.3000e-004	0.0285	8.2000e-004	0.0293	8.2100e-003	7.8000e-004	8.9900e-003	0.0000	69.7425	69.7425	2.8000e-004	9.9600e-003	72.7181
Worker	0.0130	0.0135	0.1737	5.0000e-004	0.0583	3.2000e-004	0.0587	0.0155	2.9000e-004	0.0158	0.0000	46.5345	46.5345	8.6000e-004	1.1200e-003	46.8903
Total	**0.0148**	**0.1318**	**0.1945**	**1.2300e-003**	**0.0868**	**1.1400e-003**	**0.0880**	**0.0237**	**1.0700e-003**	**0.0248**	**0.0000**	**116.2770**	**116.2770**	**1.1400e-003**	**0.0111**	**119.6084**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1593	2.5744	5.1799	0.0104		0.0159	0.0159		0.0159	0.0159	0.0000	902.5518	902.5518	0.1876	0.0000	907.2412
Total	**0.1593**	**2.5744**	**5.1799**	**0.0104**		**0.0159**	**0.0159**		**0.0159**	**0.0159**	**0.0000**	**902.5518**	**902.5518**	**0.1876**	**0.0000**	**907.2412**

Mitigated Construction Off-Site

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AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

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	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.8300e-003	0.1183	0.0208	7.3000e-004	0.0285	8.2000e-004	0.0293	8.2100e-003	7.8000e-004	8.9900e-003	0.0000	69.7425	69.7425	2.8000e-004	9.9600e-003	72.7181
Worker	0.0130	0.0135	0.1737	5.0000e-004	0.0583	3.2000e-004	0.0587	0.0155	2.9000e-004	0.0158	0.0000	46.5345	46.5345	8.6000e-004	1.1200e-003	46.8903
Total	**0.0148**	**0.1318**	**0.1945**	**1.2300e-003**	**0.0868**	**1.1400e-003**	**0.0880**	**0.0237**	**1.0700e-003**	**0.0248**	**0.0000**	**116.2770**	**116.2770**	**1.1400e-003**	**0.0111**	**119.6084**

Appendix C
Biological Resources Evaluation

ANTELOPE VALLEY-EAST KERN WATER AGENCY'S HIGH DESERT WATER BANK PROJECT

LOS ANGELES COUNTY, CALIFORNIA

Biological Resources Analysis

Prepared For:

Antelope Valley-East Kern Water Agency
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September 2021

ANTELOPE VALLEY-EAST KERN WATER AGENCY'S HIGH DESERT WATER BANK PROJECT

LOS ANGELES COUNTY, CALIFORNIA

Biological Resources Analysis

The undersigned certify that the statements furnished in this report and exhibits present data and information required for this biological evaluation, and the facts, statements, and information presented is a complete and accurate account of the findings and conclusions to the best of our knowledge and beliefs.

Travis J. McGill
Director/Biologist

Thomas J. McGill, Ph.D.
Managing Director

September 2021

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Appendix A Site Plans
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Section 1 Introduction

This report contains the findings of ELMT Consulting's (ELMT) updated habitat and jurisdictional assessment for Antelope Valley-East Kern Water Agency's (Agency) High Desert Water Bank Project (Project) located west of the City of Lancaster, near the community of Neenach in unincorporated Los Angeles County, California.

In 2017, the Agency evaluated the Project under the California Environmental Quality Act (CEQA) and adopted a Mitigated Negative Declaration (MND). The Project involved the development and operation of a groundwater bank on approximately 1,500 acres with 322 acres designated for habitat management. Recharge would occur through the development of low, shallow berms over approximately 1,200 acres, with approximately 400 acres being used for recharge at any given time. Recharge activities would be similar to the agricultural practice of flooding where the low berms would constantly be re-established.

Since the time of the MND adoption, several design components changed, including the recharge areas and methods and the location of the habitat management area. Under the new design, recharge would occur over 890 acres of fixed, engineered basins. Low, shallow berms would be used in the two large drainages that traverse the site. The location of the 322 acres designated for habitat management also was revised.

The original habitat assessment and associated mitigation measures were identified in a 2017 report by AECOM, "Antelope Valley-East Kern Water Agency, High Desert Water Bank Project, Revised Biological Technical Report." This updated habitat assessment was conducted to:

- Update existing site conditions since the time of the 2017 biological assessment;
- Assess the probability of occurrence of special-status[1] plant and wildlife species that could pose a constraint to project implementation under the new design;
- Provide an analysis of the new habitat management locations to ensure that the revised locations of the habitat management lands were of equal or greater value;
- Assess if the mitigation measures provided in the previous biological assessment were adequate based on the revised design;
- Evaluate the site's natural drainage features, ponded areas, and/or water bodies previously identified to determine areas under the new design that have the potential to fall under the regulatory authority of the of the United States Army Corps of Engineers (Corps), Regional Water Quality Control Board (Regional Board), or California Department of Fish and Wildlife (CDFW) pursuant to Sections 401 and 404 of the Federal Clean Water Act (CWA), the California Porter-Cologne Water Quality Control Act, and Section 1600 *et seq.* of the Fish and Game Code.

[1] As used in this report, "special-status" refers to plant and wildlife species that are federally or State listed, proposed, or candidates; plant species that have been designated a California Native Plant Society (CNPS) Rare Plant Rank; and wildlife species that are designated by the California Department of Fish and Wildlife (CDFW) as fully protected, species of special concern, or watch list species.

For this evaluation, ELMT biologists Travis J. McGill and Jacob H. Lloyd Davies conducted a field survey and evaluated the condition of the habitat within the project site on August 19, 2021.

1.1 PROJECT LOCATION

The project site is generally located north of State Route 138, east of Interstate 5, south of the Tehachapi Mountains, and west of State Route 14 in unincorporated Los Angeles County, California (Exhibit 1, *Regional Vicinity*). The site is depicted on the La Liebre Ranch quadrangle of the United States Geological Survey's (USGS) 7.5-minute topographic map series within Sections 1, 2, 11, and 12 of Township 8 North, Range 17 West (Exhibit 2, *Site Vicinity*). Specifically, the project site is bounded to the north by West Avenue A, to the west by 300th Street West, to the south by the California Aqueduct, and to the west by 180th Street West within the following Assessor Parcel Numbers (APNs) (Exhibit 3, *Project Site*):

3275-002-001	3275-003-002	3275-021-009	3275-021-029
3275-002-002	3275-003-003	3275-021-010	3275-021-030
3275-002-003	3275-003-004	3275-021-011	3275-021-031
3275-002-004	3275-003-005	3275-021-012	3275-021-032
3275-002-005	3275-003-006	3275-021-013	3275-021-033
3275-002-006	3275-003-007	3275-021-014	3275-021-034
3275-002-007	3275-003-008	3275-021-015	3275-021-035
3275-002-008	3275-003-009	3275-021-016	3275-021-036
3275-002-009	3275-003-010	3275-021-017	3275-021-037
3275-002-010	3275-006-007	3275-021-018	3275-021-038
3275-002-011	3275-006-905	3275-021-019	3275-021-039
3275-002-012	3275-007-011	3275-021-020	3275-021-040
3275-002-013	3275-021-001	3275-021-021	3275-021-041
3275-002-014	3275-021-002	3275-021-022	3275-021-042
3275-002-015	3275-021-003	3275-021-023	3275-021-043
3275-002-016	3275-021-004	3275-021-024	3275-021-044
3275-002-017	3275-021-005	3275-021-025	3275-021-045
3275-002-018	3275-021-006	3275-021-026	3275-021-046
3275-002-019	3275-021-007	3275-021-027	
3275-002-020	3275-021-008	3275-021-028	

1.2 PROJECT DESCRIPTON

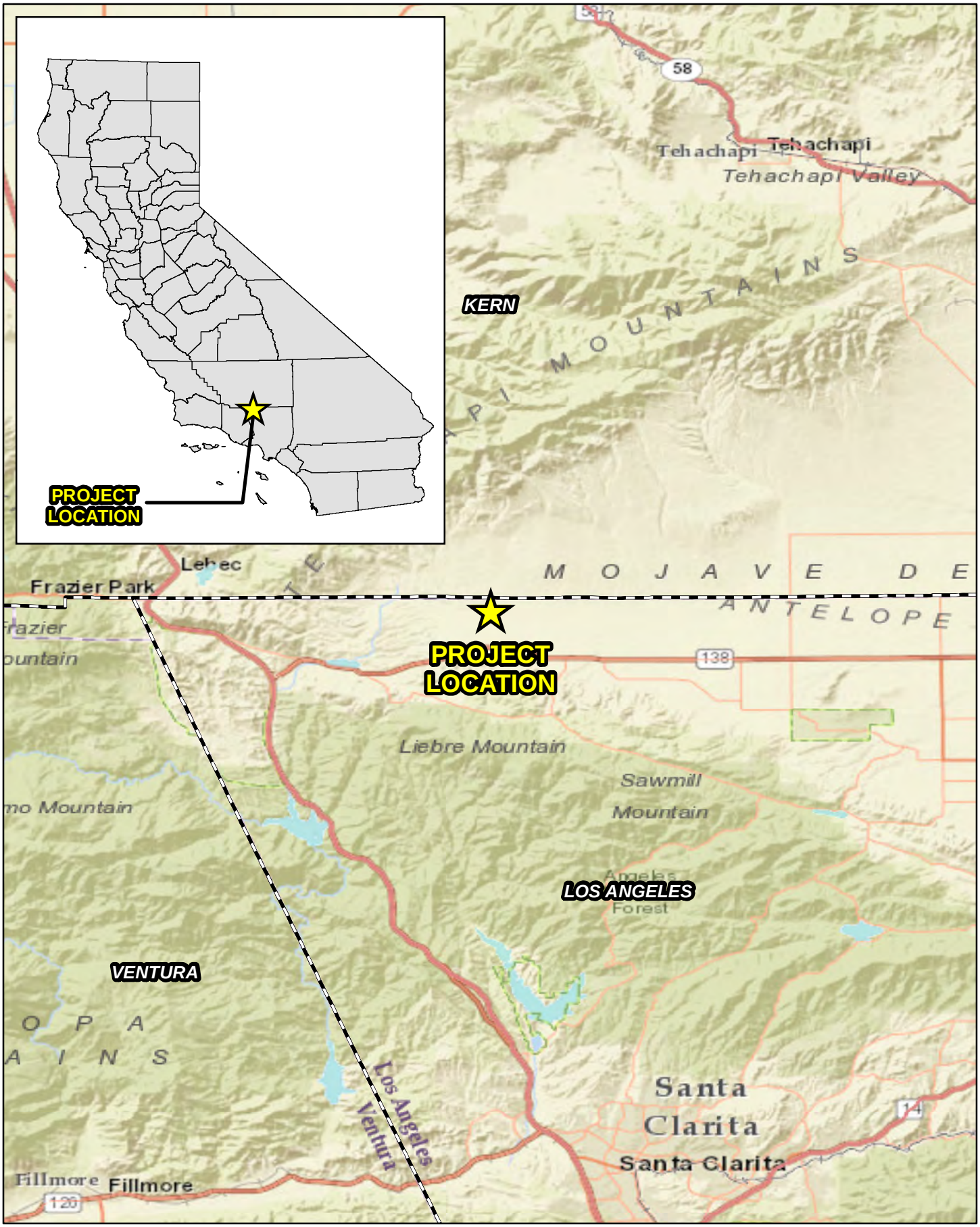
The Project involves the development and operation of a groundwater bank on approximately 1,500 acres of land in the western edges of the Antelope Valley. The project would store State Water Project (SWP) water supplies from the Agency and other banking participants during wet weather year periods when supplies exceed demands and would recover the water for use by the Agency and its partners during dry weather years when demands exceed supplies and other times when there are disruptions to State Water Project supplies. Implementation of this project will require the construction of monitoring and production

water wells, turnout(s) from the California Aqueduct, East Branch, underground and above ground pipelines, recharge basins, and water storage and booster pump facilities.

Since the time of the MND adoption in 2017, various components of the Project design were changed. The following table identifies the various components, the original design and the changes that occurred.

Feature	**2017 Original Project Design**	**2021 Revised Project Design**
Capacity	280,000 AF groundwater Bank 70,000 AF/Yr Recharge/Recovery	No change
Aqueduct Turnout	1 new 150 cfs; rehab existing	1 new 250 cfs; no rehab of existing
Recharge Facilities	1,200 acres low earthen berms with 400 acres inundated annually, rotating throughout site; berms designed to be sacrificial during large storm events and reconstructed.	890 acres consisting of 42 engineered and flood-protected basins defined by engineered, compacted berms, with 890 acres available for use annually, with 890 acres anticipated to be inundated over eight months.
Recovery Facilities	18 (2,500 gpm each)	28 (1,800 to 2,200 gpm each)
Transmission Facilities	Above ground: 3.5 miles Below ground: 9.5 miles	Above ground: 0 Below ground: 11.5 miles
Monitoring Wells	5	No change
Pump Station and pump station building, storage tank, maintenance	Included	Storage tank or Pump Station Building no longer required
Habitat Management Lands	322 Acres	No change to acreage; location change only

Refer to Appendix A, Site Plans.



ANTELOPE VALLEY-EAST KERN WATER AGENCY'S HIGH DESERT WATER BANK PROJECT
BIOLOGICAL RESOURCES REPORT

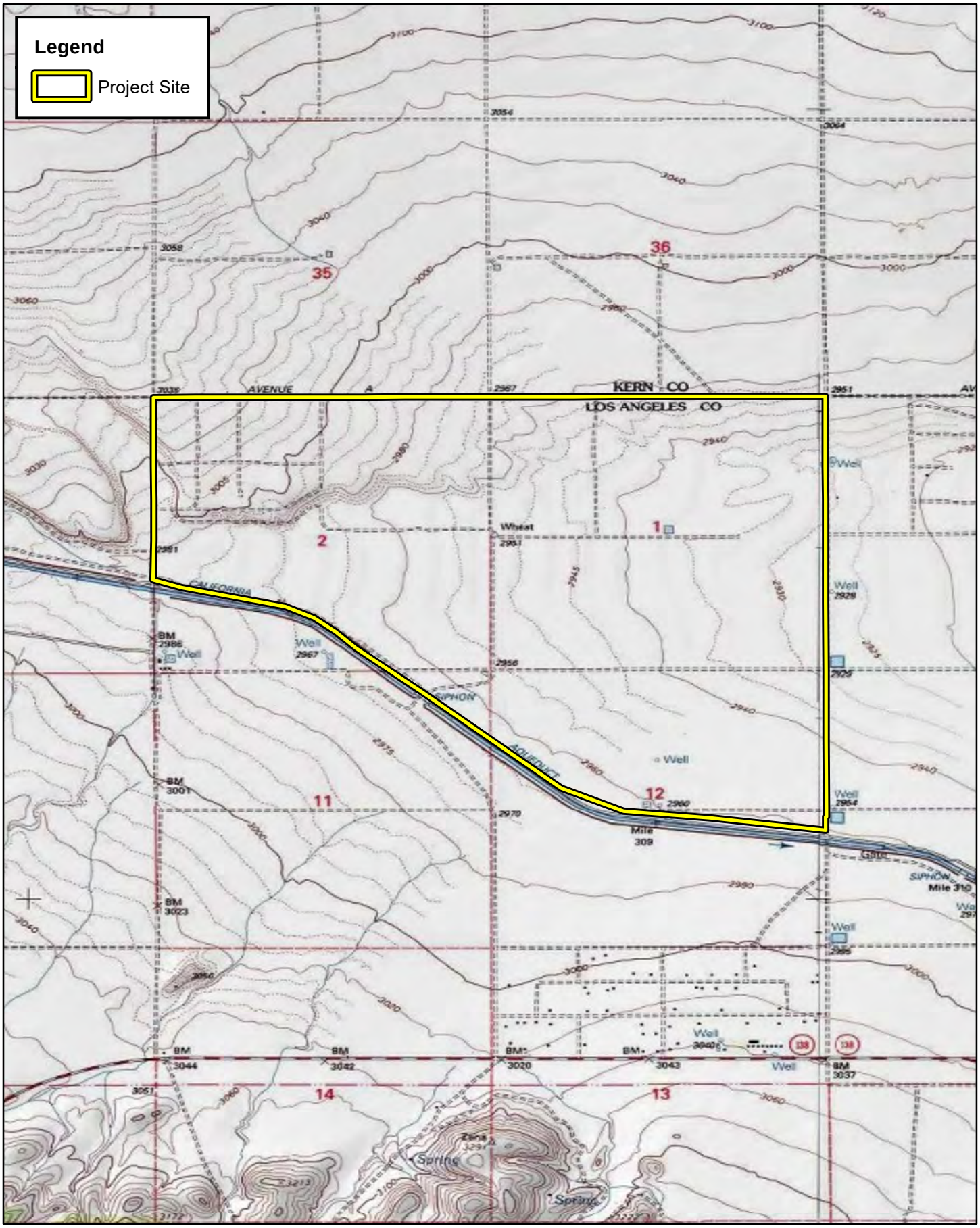
ELMT CONSULTING

0 2.5 5 10 Miles

Source: World Street Map, Los Angeles County

Regional Vicinity

Exhibit 1



ANTELOPE VALLEY-EAST KERN WATER AGENCY'S HIGH DESERT WATER BANK PROJECT
BIOLOGICAL RESOURCES REPORT

ELMT CONSULTING

0 1,000 2,000 4,000 Feet

Source: USA Topographic Map, Los Angeles County

Site Vicinity

Exhibit 2

ANTELOPE VALLEY-EAST KERN WATER AGENCY'S HIGH DESERT WATER BANK PROJECT
BIOLOGICAL RESOURCES REPORT

ELMT CONSULTING

0 625 1,250 2,500 Feet

Source: ESRI Aerial Imagery, World Transportation, Los Angeles County

Project Site

Exhibit 3

Section 2 Methodology

A literature review and records search were conducted to determine which special-status biological resources have the potential to occur on or within the general vicinity of the project site. In addition to the literature review, a general habitat assessment or field investigation of the project site was conducted. The field investigation was conducted to document existing conditions within the project site and assess the potential for special-status biological resources to occur.

2.1 LITERATURE REVIEW

Prior to conducting the field investigation, a literature review and records search was conducted for special-status biological resources potentially occurring on or within the vicinity of the project site. Previously recorded occurrences of special-status plant and wildlife species and their proximity to the project site were determined through a query of the CDFW QuickView Tool in the Biogeographic Information and Observation System (BIOS), CNDDB Rarefind 5, the California Native Plant Society's (CNPS) Electronic Inventory of Rare and Endangered Vascular Plants of California, Calflora Database, compendia of special-status species published by CDFW, and the United States Fish and Wildlife Service (USFWS) species listings.

All available reports, survey results, and literature detailing the biological resources previously observed on or within the vicinity of the project site were reviewed to understand existing site conditions and note the extent of any disturbances that have occurred on the project site that would otherwise limit the distribution of special-status biological resources. Standard field guides and texts were reviewed for specific habitat requirements of special-status and non-special-status biological resources, as well as the following resources:

- Google Earth Pro historic aerial imagery (1985-2018);
- United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS), Soil Survey[2];
- USFWS Critical Habitat designations for Threatened and Endangered Species; and
- USFWS National Wetlands Inventory (NWI).
- AECOM, 2017, Antelope Valley-East Kern Water Agency, High Desert Water Bank Project, Revised Biological Technical Report

The literature review provided a baseline from which to inventory the biological resources potentially occurring on the subject property. The CNDDB database was used, in conjunction with ArcGIS software, to locate the nearest recorded occurrences of special-status species and determine the distance from the project site.

[2] A soil series is defined as a group of soils with similar profiles developed from similar parent materials under comparable climatic and vegetation conditions. These profiles include major horizons with similar thickness, arrangement, and other important characteristics, which may promote favorable conditions for certain biological resources.

2.2 FIELD INVESTIGATION

ELMT biologists Travis J. McGill and Jacob H. Lloyd Davies evaluated the extent and conditions of the plant communities found within the boundaries of the project site on August 19, 2021. Plant communities identified on aerial photographs during the literature review were verified in the field by walking meandering transects through the on-site plant communities and along boundaries between plant communities. The plant communities were evaluated for their potential to support special-status plant and wildlife species. In addition, field staff identified any natural corridors and linkages that may support the movement of wildlife through the area. Special attention was given to special-status habitats and/or undeveloped areas, which have higher potentials to support special-status plant and wildlife species.

All plant and wildlife species observed, as well as dominant plant species within each plant community, were recorded. Wildlife detections were made through observation of scat, trails, tracks, burrows, nests, and/or visual and aural observation. In addition, site characteristics such as soil condition, topography, hydrology, anthropogenic disturbances, indicator species, condition of on-site plant communities, and presence of potential jurisdictional drainage and/or wetland features were noted.

2.3 SOIL SERIES ASSESSMENT

On-site and adjoining soils were researched prior to the field survey using the USDA NRCS Soil Survey for Los Angeles County, Antelope Valley Area. In addition, a review of the local geological conditions and historical aerial photographs was conducted to assess the ecological changes that the project site has undergone.

2.4 PLANT COMMUNITIES

Plant communities were mapped using 7.5-minute USGS topographic base maps and aerial photography. The plant communities were classified in accordance with Sawyer, Keeler-Wolf and Evens (2009), CDFW (2010) and Holland (1986), delineated on an aerial photograph, and then digitized into ArcGIS. The ArcGIS application was used to compute the area of each plant community in acres.

2.5 PLANTS

Common plant species observed during the field survey were identified by visual characteristics and morphology in the field and recorded in a field notebook. Unusual and less familiar plants were photographed in the field and identified in the laboratory using taxonomic guides. Taxonomic nomenclature used in this study follows the 2012 Jepson Manual (Hickman 2012). In this report, scientific names are provided immediately following common names of plant species (first reference only).

2.6 WILDLIFE

Wildlife species detected during field surveys by sight, calls, tracks, scat, or other sign were recorded during surveys in a field notebook. Field guides were used to assist with identification of wildlife species during the survey included The Sibley Field Guide to the Birds of Western North America (Sibley 2003), A Field

Guide to Western Reptiles and Amphibians (Stebbins 2003), and A Field Guide to Mammals of North America (Reid 2006). Although common names of wildlife species are fairly well standardized, scientific names are provided immediately following common names in this report (first reference only).

2.7 JURISDICTIONAL DRAINAGES AND WETLANDS

Aerial photography was reviewed prior to conducting a field investigation in order to locate and inspect any potential natural drainage features, ponded areas, or water bodies that may fall under the jurisdiction of the Corps, Regional Board, and/or CDFW. In general, surface drainage features indicated as blue-line streams on USGS maps that are observed or expected to exhibit evidence of flow are considered potential riparian/riverine habitat and are also subject to state and federal regulatory jurisdiction. In addition, ELMT reviewed jurisdictional waters information through examining historical aerial photographs to gain an understanding of the impact of land-use on natural drainage patterns in the area. The USFWS NWI and Environmental Protection Agency (EPA) Water Program “My Waters” data layers were also reviewed to determine whether any hydrologic features and wetland areas have been documented on or within the vicinity of the project site.

Section 3 Existing Conditions

3.1 LOCAL CLIMATE

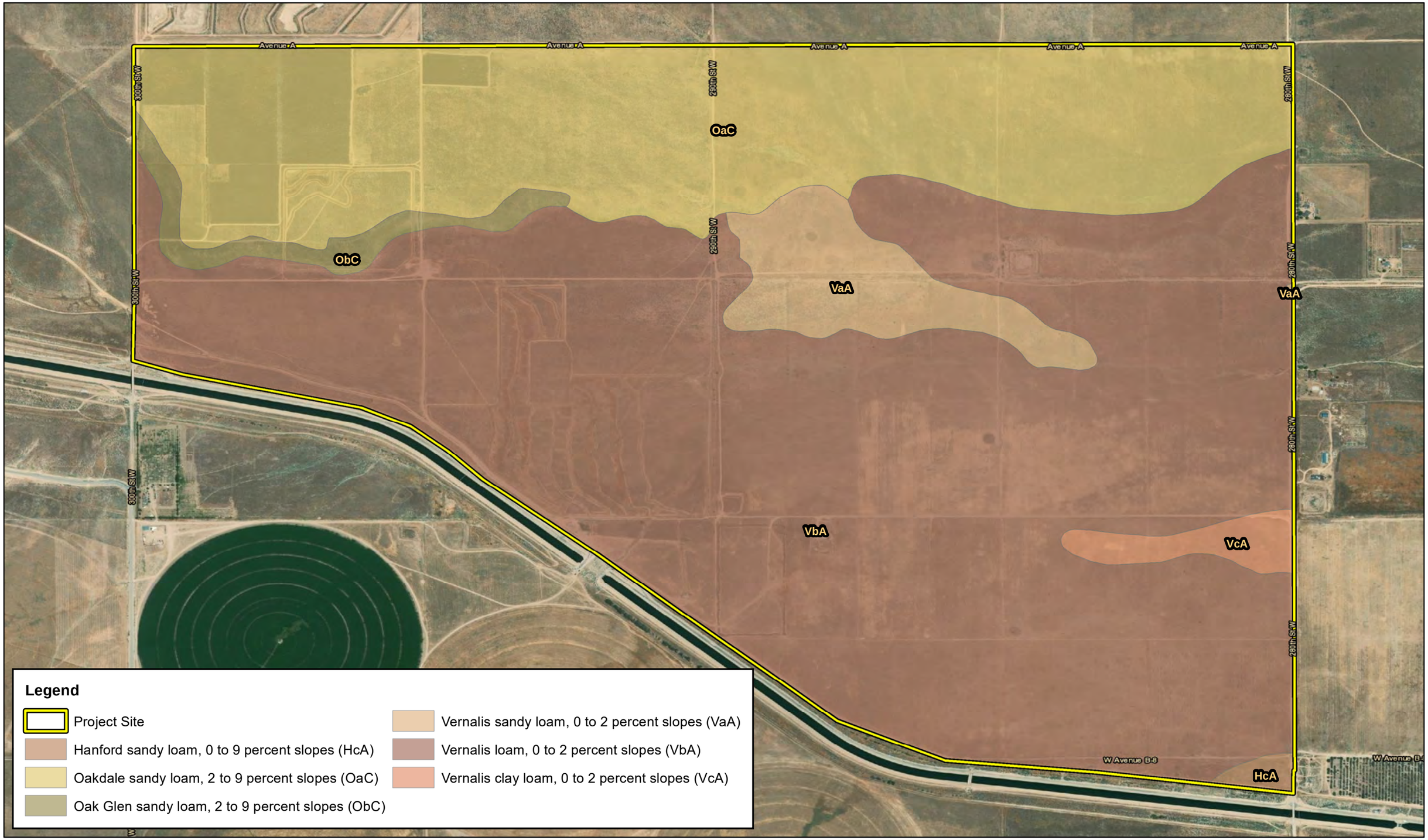
The Mojave Desert is found at elevations of 2,000 to 5,000 feet above mean sea level and is characterized by cool winter temperatures and warm summer temperatures, with its rainfall occurring almost entirely in the winter. Climatological data obtained for the City of Lancaster indicates the annual precipitation averages 7.38 inches per year. Almost all of the precipitation in the form of rain occurs in the months between October and April, with hardly any occurring between the months of May and September. The wettest month is February, with a monthly average total precipitation of 1.78 inches. The average minimum and maximum temperatures for the region are 47 and 77 degrees Fahrenheit (°F) respectively with December (monthly average 30° F) being the coldest month and July and August being the hottest (monthly average 98° F). Temperatures during the site visit were in the low-60s to mid-70s (° F).

3.2 TOPOGRAPHY AND SOILS

On-site surface elevation ranges from approximately 2,930 to 3,040 feet above mean sea level. The highest elevation occurs in the northwest corner, with the rest of the site generally sloping from west to east. According to the NRCS Custom Soil Resource Report, the project site is underlain by the following soil units: Hanford sandy loam (0 to 2 percent slopes), Oakdale sandy loam (2 to 9 percent slopes), Oak Glen sandy loam (0 to 9 percent slopes), Vernalis sandy loam (0 to 2 percent slopes), Vernalis loam (0 to 2 percent slopes), and Vernalis clay loam (0 to 2 percent slopes). (Exhibit 4, *Soils*). Soils supported by the project site have been compacted and disturbed by decades of agricultural land uses and ranching and grazing activities.

3.3 SURROUNDING LAND USES

The project site is located in a primarily undeveloped area in unincorporated Los Angeles County. The site is surrounded immediately by undeveloped, land to the west, north, and east, and the California Aqueduct to the south with undeveloped land beyond. Immediate land uses in the vicinity of the site include agricultural activities in all directions, water detention basins immediately north of the northwest portion of the site, and residential parcels scattered throughout the area. A network of dirt trails and access roads traverse the site and surrounding area, both north and south of the Aqueduct.



ANTELOPE VALLEY-EAST KERN WATER AGENCY'S HIGH DESERT WATER BANK PROJECT
BIOLOGICAL RESOURCES REPORT

ELMT CONSULTING

0 625 1,250 2,500 Feet

Source: ESRI Aerial Imagery, Soil Survey Geographic Database, World Transportation, Los Angeles County

Soils

Exhibit 4

Section 4 Discussion

4.1 SITE CONDITIONS

The project site encompasses an area that historically supported agricultural and grazing activities. The site is primarily composed of undeveloped, vacant land with varying degrees of disturbance, along with developed land associated with historic and recent land uses. Site conditions appear to be unchanged since the time of the 2017 evaluation.

4.2 VEGETATION

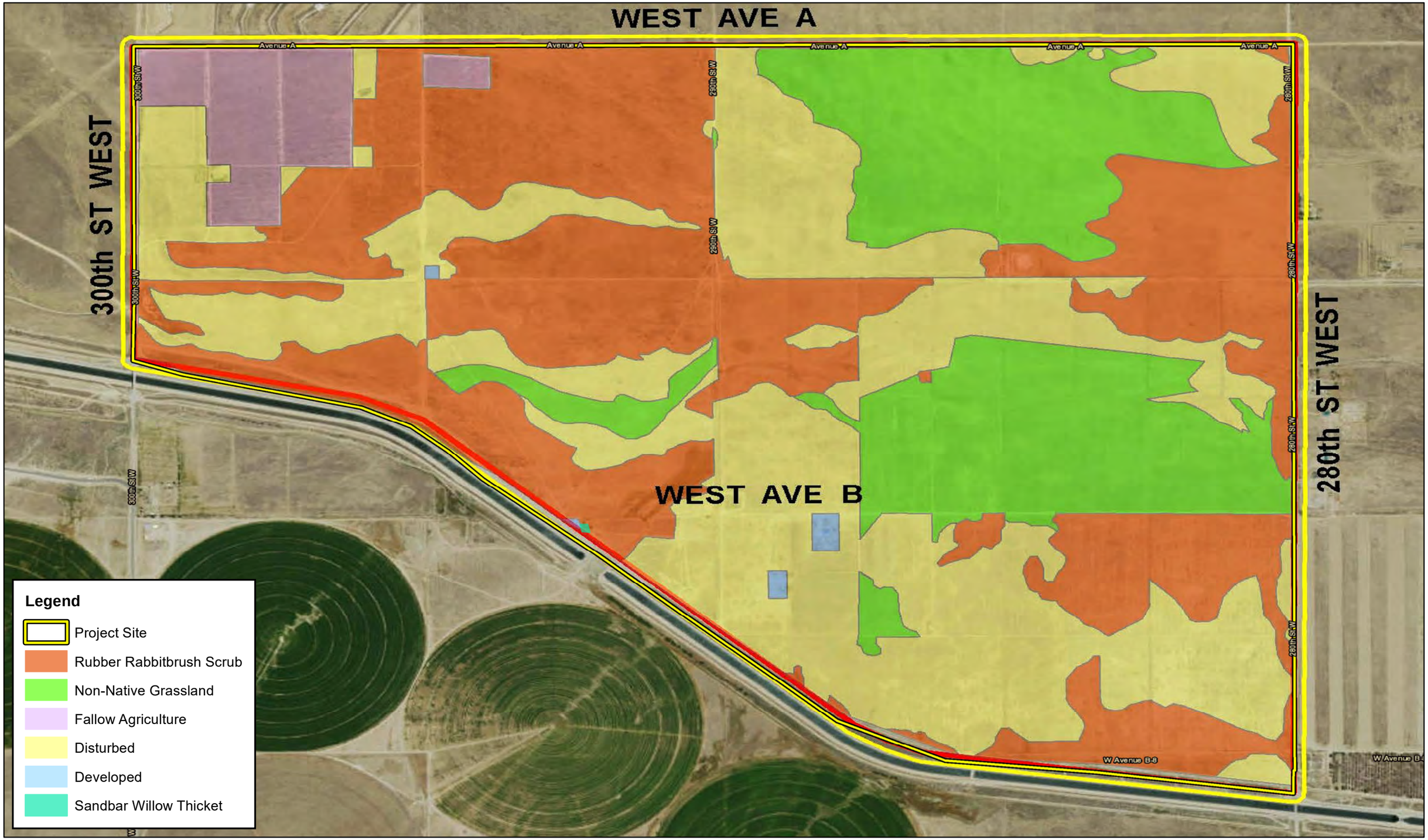
Three (3) native vegetation communities and two (2) anthropogenic land cover types were documented in AECOM's 2017 report: fiddleneck fields, non-native annual grassland, rubber rabbitbrush scrub, fallow agriculture, and developed. During the 2021 field investigation four (4) plant communities were observed within the boundary of the project site: rubber rabbitbrush scrub, sandbar willow thicket, fallow agriculture, and non-native grassland (Exhibit 5, *Vegetation*). In addition, two (2) land cover types that would be classified as disturbed and developed were observed. The fiddleneck fields documented onsite in the 2017 report were renamed as disturbed areas in this report since large stands of fiddleneck were not observed. Additionally, a new plant community was identified in this report, sandbar willow thicket, that was not identified in the 2017 report. The vegetation communities and land cover types are described in further detail below.

4.3.1 Rubber Rabbitbrush Scrub

The rubber rabbitbrush scrub plant community occurs commonly throughout the project site where the prevailing shrubby perennials native to the area have revegetated naturally. This plant community corresponds with the rubber rabbitbrush scrub habitat documented in the 2017 report. This plant community is dominated by rubber rabbitbrush (*Ericameria nauseosa*) in varying densities and supports a sparse herbaceous later. Common plant species observed in this plant community include bladderpod (*Peritoma arboera*), saltbushes (*Atriplex canescens* & *A. polycarpa*), fiddleneck (*Amsinckia* spp.), annual sunflower (*Helianthus annuus*), heliotrope (*Heliotropium curassavicum*), jimsonweed (*Datura wrightii*), California mustard (*Caulanthus lasiophyllus*), Mediterranean mustard (*Hirschfeldia incana*), dove weed (*Croton setiger*), slender buckwheat (*Eriogonum* sp.), and non-native grasses (*Bromus* spp. & *Hordeum murinum*).

4.3.2 Fallow Agriculture

The northwest corner of the project site supports fallow agriculture, remnant from historic land uses. This plant community corresponds with the fallow agriculture habitat documented in the 2017 report. This plant community is composed almost uniformly of dead and mostly dead peach trees (*Prunus persica*), with an often-dense herbaceous layer composed primarily of weedy/early successional species such as Mediterranean mustard, fiddleneck, filaree (*Erodium* spp.), and non-native grasses.



ANTELOPE VALLEY-EAST KERN WATER AGENCY'S HIGH DESERT WATER BANK PROJECT
BIOLOGICAL RESOURCES REPORT

Vegetation

Source: ESRI Aerial Imagery, AECOM 2017 Biological Technical Report, World Transportation, Los Angeles County

Exhibit 5

4.3.3 Non-Native Annual Grassland

A non-native grassland plant community is found throughout the project site. This plant community corresponds with the non-native annual grassland habitat documented in the 2017 report. This plant community often occurs where agricultural activities or other anthropogenic disturbances are no longer present, and land is revegetated and becomes dominated by non-native grasses. The non-native grassland plant community supported by the project site is dominated by brome species such as bromes and mouse barley. Other common plant species that occur in Mediterranean mustard, western ragweed (*Ambrosia psilostachya*), fiddleneck, dove weed, Russian thistle (*Salsola tragus*), filaree, rubber rabbitbrush, four o'clock (*Mirabilis multiflora* var. *glandulosa* & *A. m. pubescens*), and beard grass.

4.3.4 Disturbed

The majority of the project site supports disturbed land as a result of decades of agricultural activities followed by land abandonment. This land cover type corresponds with the fiddleneck fields habitat documented in the 2017 report. Large stands of fiddleneck were not observed during the 2021. In addition, furrows and low berms have been constructed throughout the site in recent years. Further, an array of dirt roads and trails exists within the site as a result of regular and off-highway vehicle use throughout the area. Disturbed areas supported by the project site vary in vegetation density from barren to dense monoculture. Common plant species observed in the disturbed portions of the site include tumbleweed (*Amaranthus albus*), Russian thistle, Mediterranean mustard, non-native grasses, filaree, Canada horseweed, wire lettuce (*Stephanomeria pauciflora*), horse nettle (*Solanum eleagnifolium*), coyote melon (*Cucurbita palmata*), and fiddleneck.

4.3.5 Developed

Developed areas generally encompass all buildings/structures, parks, and paved, impervious surfaces. Within the boundaries of the project site, developed areas include existing residential structures and buildings, pump stations and other pipeline infrastructure, ornamental landscaping, paved roads, and unpaved roads used frequently enough to ensure substantial soil compaction. Developed areas are largely devoid of vegetation or support only weedy/early successional species adapted to growing in heavily compacted soils. This land cover type corresponds with the disturbed areas documented in the 2017 report.

4.3.6 Sandbar Willow Thicket

The sandbar willow thicket plant community is found only within and near a pump discharge basin near the middle of the southern boundary of the project site. This plant community was not documented in the 2017 report, but was mentioned in the water features section of the 2017 report. This area is fed constantly by water from the adjacent pump station and also supports a small pond feature as a result of overflow within the pump station. This plant community is dominated by sandbar willow (*Salix exigua*) that occurs in high enough density as to form a thicket. Additional plant species observed in the sandbar willow thicket include Fremont cottonwood (*Populus fremontii*), cattail (*Typha* sp.), toad rush (*Juncus bufonius*), salt cedar (*Tamarix ramossisima*), beard grass (*Polypogon* sp.), sprangletop (*Leptochloa fusca*), and water speedwell (*Veronica anagallis-aquatica*).

4.3 GENERAL WILDLIFE

Plant communities provide foraging habitat, nesting and denning sites, and shelter from adverse weather or predation. This section provides a discussion of those wildlife species that were observed during the field survey or that are expected to occur within the project site. The discussion is to be used as a general reference and is limited by the season, time of day, and weather condition in which the field survey was conducted. Wildlife detections were based on calls, songs, scat, tracks, burrows, and direct observation.

4.4.1 Fish

The only hydrogeomorphic feature (e.g., perennial creeks, ponds, lakes, reservoirs) supported by the project site that has marginal potential to support fish species is the pond feature that occurs near the middle of the southern boundary. No fish were observed within the pond feature. Since the only upstream flows to the feature must first pass through the pump station, no naturally-occurring fish species are expected to occur. The only fish species that may be expected to occur would be mosquitofish (*Gambusia affinis*), a small non-native species that is commonly introduced to aquatic systems as a vector control measure. No special-status fish species are expected to occur within the pond feature.

4.4.2 Amphibians

The only hydrogeomorphic feature supported by the project site that is capable of providing suitable habitat for amphibian species is the pond feature that occurs near the middle of the southern boundary. No amphibians were observed within the pond feature. Since the only direct upstream flows to the feature must first pass through the pump station, no amphibians are expected to be introduced via the pump station. However, amphibian species adapted to extremely disturbed conditions that are capable of migrating via flows during storm events may be able to migrate from nearby areas. Common amphibian species that have the potential to occur on-site include western toad (*Anaxyrus boreas*) and chorus frog (*Pseudacris hypochondriaca*). No special-status amphibian species are expected to occur within the pond feature.

4.4.3 Reptiles

The plant communities supported by the project site provide suitable foraging and cover habitat for a variety of reptilian species adapted to conditions within the Mojave Desert. No reptilian species were observed during the field investigation. Common reptilian species that may be expected to occur include side-blotched lizard (*Uta stansburiana elegans*) and Great Basin gopher snake (*Pituophis catenifer deserticola*), desert horned lizard (*Phrynosoma platyrhinos calidiarum*), great basin whiptail (*Aspidoscelis tigris tigris*), southwestern speckled rattlesnake (*Crotalus mitchellii pyrrhus*), western zebra-tailed lizard (*Callisaurus draconoides rhodostictus*), and northern Mohave rattlesnake (*Crotalus scutulatus scutulatus*).

4.4.4 Birds

The plant communities supported by the project site provide suitable foraging and nesting habitat for a variety of resident and migrant bird species adapted to conditions within the Mojave Desert. Avian species detected during the survey included common raven (*Corvus corax*), mourning dove (*Zenaida macroura*), horned lark (*Eremophila alpestris actia*), American kestrel (*Falco sparverius*), western meadowlark

(*Sturnella neglecta*), barn swallow (*Hirundo rustica*), loggerhead shrike (*Lanius ludovicianus*), and black-crowned night-heron (*Nycticorax nycticorax*).

4.4.5 Mammals

The plant communities surrounding and supported by the project site provide limited foraging and denning habitat for a variety of mammalian species adapted to conditions within the Mojave Desert. Most mammal species are nocturnal and are difficult to observe during a diurnal field visit. Mammalian species observed or detected during the field investigation were coyote (*Canis latrans*), black-tailed jackrabbit (*Lepus californicus*) and California ground squirrel (*Otospermophilus beecheyi*). Common mammalian species that could be expected to occur on-site include white-tailed antelope ground squirrel (*Ammospermophilus leucurus*), and desert cottontail (*Sylvilagus audubonii*). No bat species are expected to occur due to a lack of suitable roosting habitat (i.e., trees, crevices, abandoned structures) within and surrounding the project site.

4.4 NESTING BIRDS

No active nests or birds exhibiting nesting behaviors were observed during the field survey, which was conducted during the nesting season. The plant communities supported on-site provide suitable foraging and nesting habitat for year-round and seasonal avian residents, as well as migrating songbirds that have adapted to conditions in the Mojave Desert. In addition, the open areas on-site also provides nesting opportunities for ground-nesting species such as killdeer (*Charadrius vociferus*). No raptors are expected to nest on-site due to lack of suitable nesting opportunities.

Nesting birds are protected pursuant to the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code (Sections 3503, 3503.5, 3511, and 3513 prohibit the take, possession, or destruction of birds, their nests or eggs). If construction occurs between February 1st and August 31st, a pre-construction clearance survey for nesting birds should be conducted within three (3) days of the start of any vegetation removal or ground disturbing activities to ensure that no nesting birds will be disturbed during construction.

4.5 WILDLIFE CORRIDORS AND LINKAGES

Habitat linkages provide links between larger undeveloped habitat areas that are separated by development. Wildlife corridors are similar to linkages but provide specific opportunities for animals to disperse or migrate between areas. A corridor can be defined as a linear landscape feature of sufficient width to allow animal movement between two comparatively undisturbed habitat fragments. Adequate cover is essential for a corridor to function as a wildlife movement area. It is possible for a habitat corridor to be adequate for one species yet inadequate for others. Wildlife corridors are significant features for dispersal, seasonal migration, breeding, and foraging. Additionally, open space can provide a buffer against both human disturbance and natural fluctuations in resources.

According to the Los Angeles County Department of Regional Planning, the project site does not occur within a Significant Ecological Area (SEA) or CDFW designated Essential Connectivity Area (ECA). As such, the site does not occur within any designated open space and has not been identified as a wildlife

corridor or linkage. Therefore, no impacts to areas deemed essential for regional habitat connectivity and wildlife migration will occur due to project-related activities.

As documented in the 2017 report, and verified during the 2021 field investigation, the project site, consists of wide, relatively flat, unobstructed lands, that has the provide to support transitory and dispersal habitat for wildlife species moving between adjacent habitats. Habitat in the vicinity of the project site on the north side of the California Aqueduct is largely continuous and consists of habitats similar to those found on the project site. Only the California Aqueduct acts as a significant barrier to wildlife migration in the vicinity of the project site, partially obstructing movement between habitats north and south of the canal. However, there are canal crossing that allow for north to south wildlife movement, including those at 280th Street W and 300th Street W, and one at the approximate mid-point along the southern boundary of the project site. The proposed project will not impact these crossings. The construction of raised, native earthen berms over approximately 1,200 acres of the project site will have the potential to reduce the quality of the overall transitory and dispersal habitat, but will still allow movements opportunities across the project site and larger region.

Flooding of the basins will temporarily obstruct dispersal and overland movement opportunities in those localized areas on the project site, but will also create watering holes for wildlife to use. However, adjacent suitable properties will remain viable for transitory movements and overland dispersal. The reduction of dispersal habitat quality and intermittent long-term temporary removal of overland dispersal habitat is not expected to significantly impact wildlife movement in the region. Project impacts to wildlife movement and habitat connectivity are expected to be less than significant.

4.6 STATE AND FEDERAL JURISDICTIONAL AREAS

There are three key agencies that regulate activities within inland streams, wetlands, and riparian areas in California. The Corps Regulatory Branch regulates discharge of dredge and/or fill materials into “waters of the United States” pursuant to Section 404 of the Federal Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act. Of the State agencies, the Regional Board regulates discharges into surface waters pursuant to Section 401 of the CWA and the California Porter-Cologne Water Quality Control Act and the CDFW regulates alterations to streambed and associated plant communities pursuant to Section 1602 of the California Fish and Game Code.

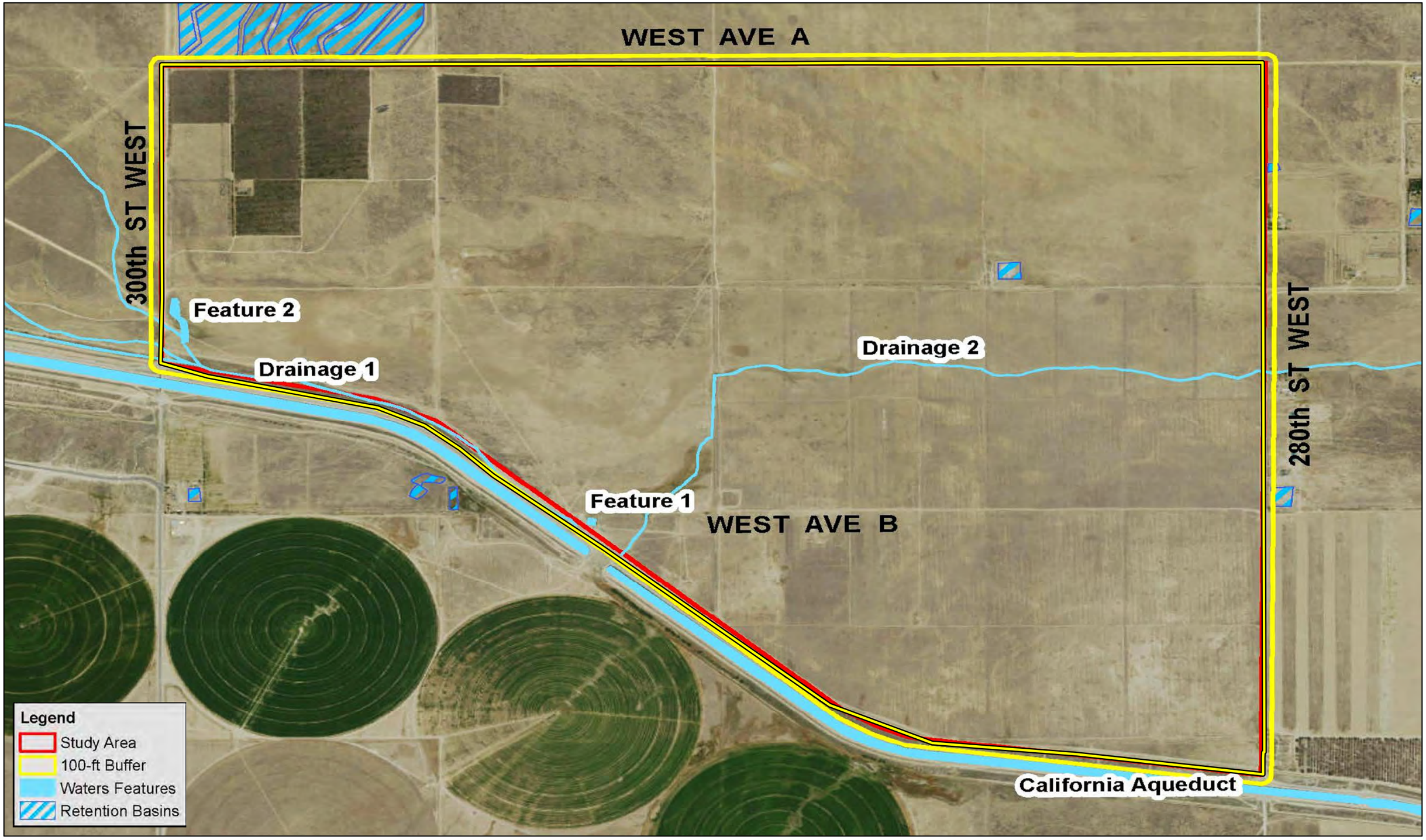
The USFWS NWI and the USGS National Hydrography Dataset were reviewed to determine if any blueline streams or riverine resources have been documented within or immediate surrounding the project site. Based on this review, three (3) riverine resources, four (4) freshwater ponds, and one (1) freshwater emergent wetland were identified within the survey area. No changes to these features were noted between the 2017 and 2021 surveys.

Of the four freshwater ponds documented by the NWI, two of these features are associated with man-made retention basins that were determined to have been destroyed prior to 2004 based on a review of historic aerial imagery; these features within the Project site that were no longer extant. The third freshwater pond documented on the NWI on the southwest corner of the project site was no longer extant. The fourth freshwater pond is located in the middle of the southern boundary of the project site and is associated near a pump discharge basin. This freshwater ponded area supports a sandbar will thicket that is fed constantly

by water from the adjacent pump station and also supports a small pond feature as a result of overflow within the pump station. The NWI also documents a freshwater emergent wetland in the middle of the southern boundary of the project site that was no longer extant; no emergent or hydrophytic vegetation and no topographic depression were observed.

Four features, documented in the 2017 report continue to be observed onsite (refer to Exhibit 6, *Drainage Features*):

- Feature 1: A single, raised retention basin with approximately 5-foot-tall dirt embankments is located in the middle of the southern boundary of the project site, north of the aqueduct crossing. This feature is relatively small, encompassing approximately 0.1 acres, and contained surface waters approximately 8-10 inches in depth during the field survey. The feature is fed by a buried discharge pipe at the northwest corner of the basin, which appears to originate at the pump station immediately west of the feature. Substrate and banks were of native soils. This feature supports the narrowleaf willow thicket plant community. Since this feature is man-made, does not possess a surface hydrologic connection to downstream waters, and was created as a retention basin in the uplands, it will likely not be considered jurisdictional by the Corps, Regional Board, and/or CDFW.
- Feature 2: Documented as a potential seasonal wetland feature on the southwest corner of the project site in the 2017 report, this feature was further degraded during the 2021 field investigation with little to no evidence of water ponding. This feature will likely be considered jurisdictional by the Corps, Regional Board, and/or CDFW.
- Drainage 1: An unnamed drainage feature conveys flows onto the southwest corner through a set of culverts that convey flows under 300th Street West. No water was present during the 2017 or 2021 field surveys. Two pairs of culverts appear to contribute flows; the southern pair is approximately 12 inches in diameter each and show direct hydrological linkage to the channel. The norther set of culverts are approximately 36 inches in diameter, and open into a deep plunge pool that may overflow into the channel during high flow events. From 300th Street W, flows are conveyed southwest roughly parallel to the unnamed access road north of the California Aqueduct. Flows cross over one existing road and disperse into upland habitat at the downstream end of the drainage in the middle of the southern boundary of the project site with no apparent connection to other features. Drainage 1 is approximately 3,880 feet, with an average width of 2 to 4 feet. This feature will likely be considered jurisdictional by the Corps, Regional Board, and/or CDFW.
- Drainage 2: A second unnamed drainage feature, referred to as Oso Canyon Floodway on the revised engineering plans, was previously documented as forming in the middle of the southern boundary of the project site from overland flows and roadway run-off near the crossing of the California Aqueduct. No surface water was present in the channel during the field surveys. The channel loses its defined banks as it continues northeast, becoming wide, poorly defined, and well-vegetated with upland species (i.e., overland sheet flow). The drainage is modified in several places, including areas where the channel has been filled in to build roadway crossings and flows pour over the road and enter the channel on the other side. At one point, flows appear to travel along an existing dirt roadway for approximately 920 feet, before crossing and continuing east as overland sheet flow across the grasslands. At the downstream end, flows from the grassland collect into a deep, wide, incised channel for the last 425 feet before crossing 280th Street W and continuing east



ELMT CONSULTING

0 625 1,250 2,500 Feet

Source: ESRI Aerial Imagery, AECOM 2017 Biological Technical Report, World Transportation, Los Angeles County

ANTELOPE VALLEY-EAST KERN WATER AGENCY'S HIGH DESERT WATER BANK PROJECT
BIOLOGICAL RESOURCES REPORT

Drainage Features

Exhibit 6

- out of the project site, eventually connecting with an unnamed ephemeral drainage that conveys flows eastward before dispersing in the uplands. Drainage 2 is approximately 7,880 feet long with an average width between 8 and 20 feet. This feature will likely be considered jurisdictional by the Corps, Regional Board, and/or CDFW.

4.7 SPECIAL-STATUS BIOLOGICAL RESOURCES

The CNDDB Rarefind 5, CNDDB Quickview Tool in BIOS and the CNPS Electronic Inventory of Rare and Endangered Vascular Plants of California were queried for reported locations of special-status plant and wildlife species as well as special-status natural plant communities in the La Liebre Ranch and Neenach School USGS 7.5-minute quadrangles. These two quadrangles were queried due to the proximity of the project site to quadrangle boundaries, on-site conditions, and regional topography. The habitat assessment evaluated the conditions of the habitat(s) within the boundaries of the project site to determine if the existing plant communities, at the time of the survey, have the potential to provide suitable habitat(s) for special-status plant and wildlife species.

The updated literature search identified ten (10) special-status plant species, fourteen (14) special-status wildlife species, and four (4) special-status plant communities as having the potential to occur within the La Liebre Ranch and Neenach School quadrangles. Special-status plant and wildlife species were evaluated for their potential to occur within the project boundaries based on habitat requirements, availability and quality of suitable habitat, and known distributions. Species determined to have the potential to occur within the general vicinity are presented in *Table C-1: Potentially Occurring Special-Status Biological Resources*, provided in Appendix C. Refer to Table C-1 for a determination regarding the potential occurrence of special-status plant and wildlife species within the project site.

4.8.1 Special-Status Plants

According to the updated review of the CNDDB and CNPS, ten (10) special-status plant species have been recorded in La Liebre Ranch and Neenach School quadrangles (refer to Appendix C). No special-status plant species were observed on-site during the field investigation. The project site has been sufficiently degraded by decades of agricultural activities and no longer supports naturally-occurring plant communities and unmixed soils required by special-status plant species. Based on habitat requirements for the identified special-status species, and known distributions, it was determined that the plant communities found on-site do not have the potential to support any of the special-status species known to occur within the vicinity of the project site.

The 2017 report determined that three special-status plant species [round-leaved filaree (*California macrophylla*), Tracy's eriastrum (*Eriastrum tracyi*), and Piute Mountains navarretia (*Navarretia setiloba*)] had a low potential to occur onsite due to soil types within the project site and the distance from known occurrences. These three species are no longer identified in the updated literature review as having the potential to occur within the La Liebre Ranch and Neenach School quadrangles. As previously noted, due to decades of agricultural activities, no special-status plant species are expected to occur onsite and are presumed absent.

4.8.2 Special-Status Wildlife

According to the updated review of the CNDDB, fourteen (14) special-status wildlife species have been reported in the La Liebre Ranch and Neenach School quadrangles (refer to Appendix C). The only special-status wildlife species observed onsite during the field surveys was California horned lark (*Eremophila alpestris actia*) and loggerhead shrike (*Lanius ludovicianus*). Based on habitat requirements for specific species and the availability and quality of on-site and adjacent habitats, it was determined that the proposed project site has a high potential to support burrowing owl (*Athene cunicularia*) and ferruginous hawk (*Buteo regalis*); a moderate potential to support tricolored blackbird (*Agelaius tricolor*); and a low potential to support golden eagle (*Aquila chrysaetos*), coastal whiptail (*Aspidoscelis tigris stejnegeri*), coast horned lizard (*Phrynosoma blainvillii*), white-faced ibis (*Plegadis chihi*), American badger (*Taxidea taxus*), and yellow-headed blackbird (*Xanthocephalus xanthocephalus*). Additionally, the Crotch bumble bee (*Bombus crotchii*), Tehachapi pocket mouse (*Perognathus alticolus inexpectatus*), desert kit fox (*Vulpes macrotis*), and Swainson's hawk (*Buteo swainsoni*), desert tortoise (*Gopherus agassizii*) listed in the 2017 biological technical report were determined to have a low potential to occur onsite or are presumed absent. It was further determined that the project site does not have the potential to support any of the other special-status wildlife species known to occur in the vicinity of the project site.

Based on the results of the updated literature review and field investigation, the following describes the potential for the special-species listed in the 2017 biological technical report to occur onsite.

Crotch Bumble Bee

No bumble bee species were observed during the 2017 or 2021 field surveys. However, as noted in the 2017 report, the project site continues to have a low potential to provide suitable habitat for this species. Suitable food plants including phaecelia (*Phaecelia* sp.) and lupines (*Lupinus* sp.) are present at low to moderate densities. Other wildflowers occur at higher densities, including fiddlenecks, but it is unknown if Crotch bumble bee will feed on these species.

Tricolored Blackbird

The project site does not support suitable nesting habitat for tricolored blackbirds since aquatic habitats are very limited. Even though the sandbar willow thicket, associated with the retention basin, supports willows and emergent riparian vegetation, it does not support large stands of dense of cattails or bulrushes needed to provide suitable nesting opportunities. However, the project site has the potential to provide suitable foraging habitat for tricolored blackbirds in the grasslands. Since tricolored blackbirds have been observed in the area, it was determined that this species has a moderate potential to occur onsite.

Burrowing Owl

No burrowing owls were observed within the project site during the 2017 or 2021 field surveys. The project site is unvegetated and/or vegetated with a variety of low-growing plant species that allow for line-of-sight observation favored by burrowing owls and the site supports suitable burrows (>4 inches in diameter) capable of providing roosting and nesting opportunities.

Tehachapi Pocket Mouse

No Tehachapi pocket mice were observed during the 2017 or 2021 field surveys. Potentially suitable habitat is present within the project site and small mammal burrowing activity was common. However, the project site occurs just below the documented elevation range for this species is not expected to occur onsite.

American Badger

No American badgers or signs of American badger, including burrows or evidence of predation attempts, were observed during the field surveys. The project site was determined to support low quality habitat for this species. Suitable prey species including kangaroo rats, rabbits, and California ground squirrels, as well as nesting birds, were observed at sufficient densities to support American badgers.

Desert Kit Fox

No desert kit fox or sign of desert kit fox were observed during field surveys. However, the project site does occur within the range for this species and provides low quality habitat. Suitable prey species, including kangaroo rats, desert cottontail, and black-tailed jackrabbits, were observed in sufficient densities to support desert kit fox.

Swainson's Hawk

There are no Swainson's hawk records within the Study Area 7.5-minute quadrangle or any adjacent 7.5-minute quadrangle, or within a 15-mile radius of the Study Area (CDFW 2017a). No Swainson's hawks or potential Swainson's hawk nests were observed within the project site during the 2017 or 2021 field surveys. However, the project site occurs within the range of Swainson's hawk, at the western edge of this species' extent within the Antelope Valley. Potential nesting habitat is extremely limited within the Study Area, although utility poles and snags and a few larger trees do occur. Potentially suitable foraging habitat that supports suitable prey species including burrowing mammals is present in the open shrubland and grassland habitats that are common throughout the Study Area. Although Swainson's hawks were not observed, this species does was determine to have a low to moderate potential to utilize the project site for foraging opportunities.

Desert Tortoise

No desert tortoises, or their sign, including scat, tracks, burrows, egg shell fragments, pallets, courtship rings, etc., were observed during the 2017 or 2021 field surveys. Given the distance from any documented occurrences, the absence of observed sign during surveys, and the fact that the project site occurs outside the USFWS-accepted current range and outside the bounds of suitable habitat as modelled by Nussear *et al.*, this species is not expected to occur within the project site.

4.8 CRITICAL HABITAT

Under the federal Endangered Species Act, "Critical Habitat" is designated at the time of listing of a species or within one year of listing. Critical Habitat refers to specific areas within the geographical range of a species at the time it is listed that include the physical or biological features that are essential to the survival and eventual recovery of that species. Maintenance of these physical and biological features requires special management considerations or protection, regardless of whether individuals or the species are present or

not. All federal agencies are required to consult with the United States Fish and Wildlife Service (USFWS) regarding activities they authorize, fund, or permit which may affect a federally listed species or its designated Critical Habitat. The purpose of the consultation is to ensure that projects will not jeopardize the continued existence of the listed species or adversely modify or destroy its designated Critical Habitat. The designation of Critical Habitat does not affect private landowners, unless a project they are proposing is on federal lands, uses federal funds, or requires federal authorization or permits (e.g., funding from the Federal Highways Administration or a CWA Permit from the Corps). If a there is a federal nexus, then the federal agency that is responsible for providing the funding or permit would consult with the USFWS.

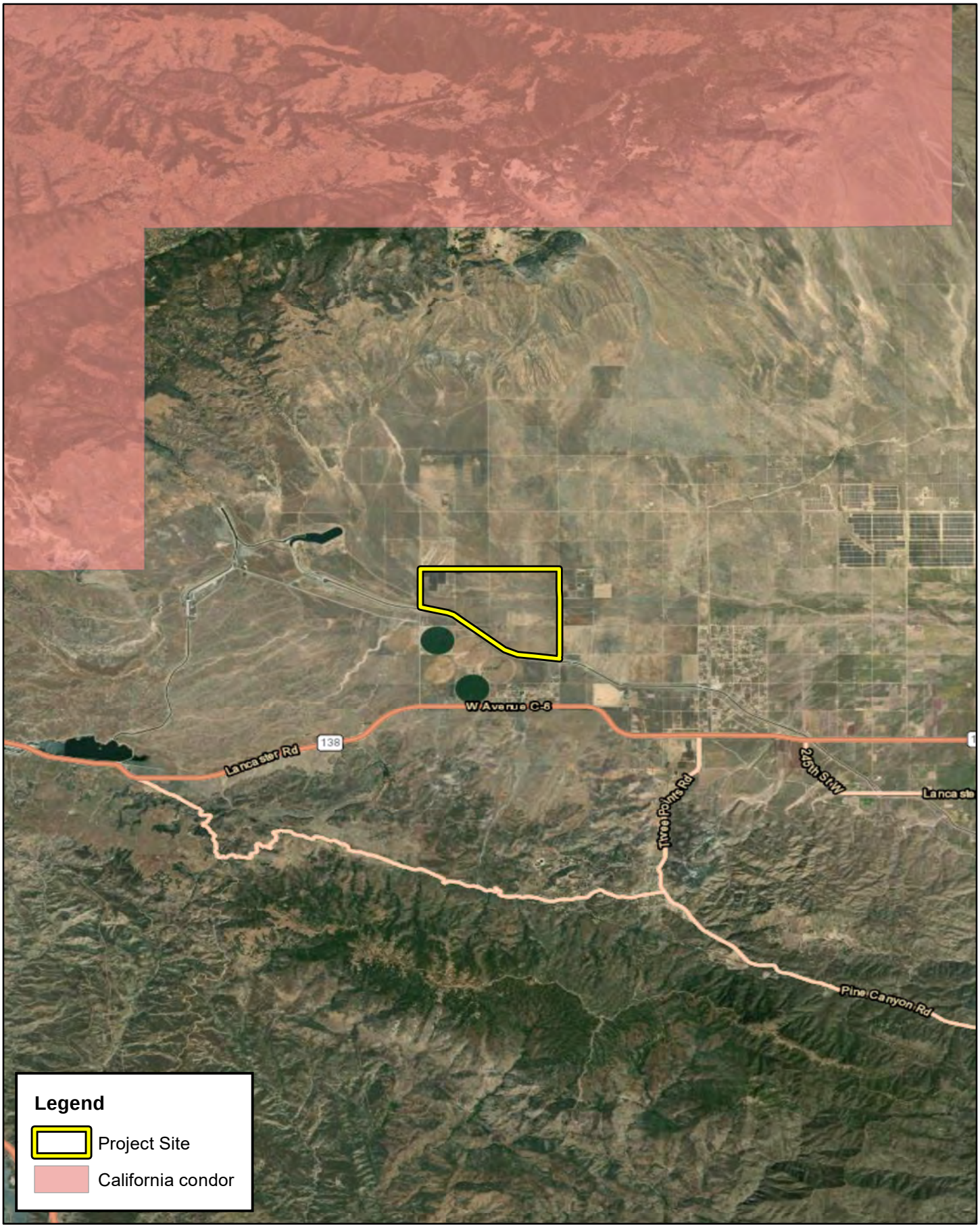
The project site is not located within federally designated Critical Habitat. The nearest Critical Habitat designation is located approximately 4 miles west of the project site for California condor (*Gymnogyps californianus*) (Exhibit 7, *Critical Habitat*). Therefore, no impacts to federally designated Critical Habitat will occur from implementation of the proposed project.

4.9 HABITAT MANAGEMENT LANDS

The proposed project includes onsite habitat management lands encompassing approximately 322 acres of the 1,500-acre site. Habitat management lands will include undisturbed areas of native and naturalized habitats, as well as areas encompassing onsite waters features, and will provide foraging, sheltering, transitory, and breeding habitat for native wildlife and plant species.

The previous project design identified the 322 acres of conservation lands along the southern boundary of the project site, and on the southeast and northwest corners of the project site. Additionally, the previous design covered Drainage 2 in the middle of the project site. The new project design identifies the lands as primarily occurring along the southern boundary of the project site, paralleling the California Aqueduct, a larger swath in the middle of the project site encompassing Drainage 2, and a smaller area on the northwest corner of the project site. Refer to Appendix A for the location of the previous and current conservation lands.

Even though the location of the 322 acres of conservation lands was redesigned, the two larger blocks of habitat along the southern boundary (adjacent to the California Aqueduct) and in the middle of the project site (encompassing Drainage 2) provide higher quality habitat for wildlife movement and foraging opportunities. Instead of the conservation lands begin confined to the southern boundary and northwest and southeast corners. The larger blocks of habitat, along with the constructed basins, provide higher quality local wildlife movement opportunities across the site, while providing potential watering holes.



ANTELOPE VALLEY-EAST KERN WATER AGENCY'S HIGH DESERT WATER BANK PROJECT
BIOLOGICAL RESOURCES REPORT

ELMT CONSULTING

0 1.25 2.5 5 Miles

Critical Habitat

Source: ESRI Aerial Imagery, USFWS Critical Habitat, Los Angeles County

Exhibit 7

Section 5 Conclusion and Recommendations

The revised project design will allow recharge to occur in wet years over approximately eight months within 890 acres of fixed engineered basins, as opposed to only 400 acres for 12 months in wet years in the previous design. However, overall, while the original design would only utilize 400 acres annually for recharge, the design including rotating the 400 acre recharge area throughout the approximately 1,200 acre site, similar to agricultural farming thus disturbing all of the 1,200 acres over time. With the revised design being fixed basins of approximately 890 acres, and recharge occurring over a shorter time frame, wildlife will have a fixed, consistent landscape in which to forage and nest as well as fixed areas for water sources. Overall, this would provide a benefit of stability to the on-site wildlife.

Further, the re-location of the 322 acres designated for habitat management (conservation lands) was also evaluated. The former location provided larger blocks of habitat in the northern and southern portions of the property with narrow pathways of refuge and movement in Drainage 1 and Drainage 2. The revised design essentially eliminates the southern block and reduces the northern block but provides a wider corridor of preservation in Drainage 2 as well as a wider strip along the aqueduct to facilitate wildlife movement between the northern and southern portions of the site, as well as good habitat in the central drainage area. The larger blocks of habitat, along with the constructed basins, provide higher quality local wildlife movement opportunities across the site, while providing potential watering holes.

Based on the result of the updated literature review and field investigation, and revised project design, the conclusions and recommendations provided in AECOM's 2017 Biological Technical Report remain valid. Impacts to special-status plant and wildlife species will be less than significant with incorporation of the mitigation measures (BIO-1 thru 12) detailed in the 2017 report and summarized below. Appendix D, *Mitigation Monitoring and Reporting Program*, provides the detailed list of the biological mitigation measures.

Special-Status Plant Species

No special-status plant species were observed during the field investigation. Based on habitat requirements for the identified special-status species, known species distributions, and the quality and availability of habitats present, it was determined that the project site does not have the potential to support any of the special-status plant species known to occur in the vicinity of the site. The project site spent the majority of the last century supporting agricultural and grazing activities, and natural plant communities are no longer present.

Even though no special-status plant species are expected to occur onsite dur to previous anthropogenic disturbances, Mitigation Measure BIO-7 (refer to Appendix D) from the 2017 biological report will be implemented to ensure that no impacts to special-status plant species will occur prior to project implementation.

Special-Status Wildlife Species

In order to ensure impacts to special-status wildlife species do not occur from implementation of the project, Mitigation Measures BIO-1, -2, -3, -4, -5, -8, and -8 (refer to Appendix D) from the 2017 biological report

will be implemented to ensure that impacts to jurisdictional drainage features, if any occur, are quantified and permitted through the appropriate regulatory agencies.

Jurisdictional Drainages, Riparian Habitat, and Special-Status Natural Communities

As documented in the 2017 biological report, and verified during the 2021 field investigation, several ephemeral drainage features, occur within the project site. The proposed Project includes habitat management lands encompassing the drainage features. Inundation containment berms will be constructed around drainages in order to avoid intrusion on jurisdictional boundaries and maintain adequate areas for flows. The freshwater emergent wetland (Feature 1) occurs outside the disturbance footprint of the proposed Project and is associated with existing infrastructure and will not be disturbed. No impacts to waters features are anticipated. If the proposed project will impact any of the features onsite, or if berms will be pushed to the banks of these features, further review will be required, and regulatory approvals will need to be obtained prior to project implementation.

Further, no sensitive habitats were identified within the project site. Thus, no sensitive natural communities will be impacted from project implementation.

Mitigation Measures BIO-6 and BIO-10 (refer to Appendix D) from the 2017 biological report will be implemented to ensure that impacts to jurisdictional drainage features, if any occur, are quantified, and permitted through the appropriate regulatory agencies (i.e., Corps, Regional Board, and/or CDFW).

Wildlife Corridors

Implementation of the proposed project will have temporary impacts to local wildlife dispersal and overland movement opportunities but will not have a significant impact regional habitat connectivity or wildlife migration.

Mitigation Measure BIO-11 (refer to Appendix D) from the 2017 biological report will be implemented to ensure that the onsite conservation lands continue to provide foraging, nesting, and denning opportunities for special-status and general wildlife species.

Local, Regional, and State Plans

The project site is not located within an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state Habitat Conservation Plan. Therefore, impacts to any local, regional, or state habitat conservation plans are not expected to occur from development of the proposed project, and mitigation is not required.

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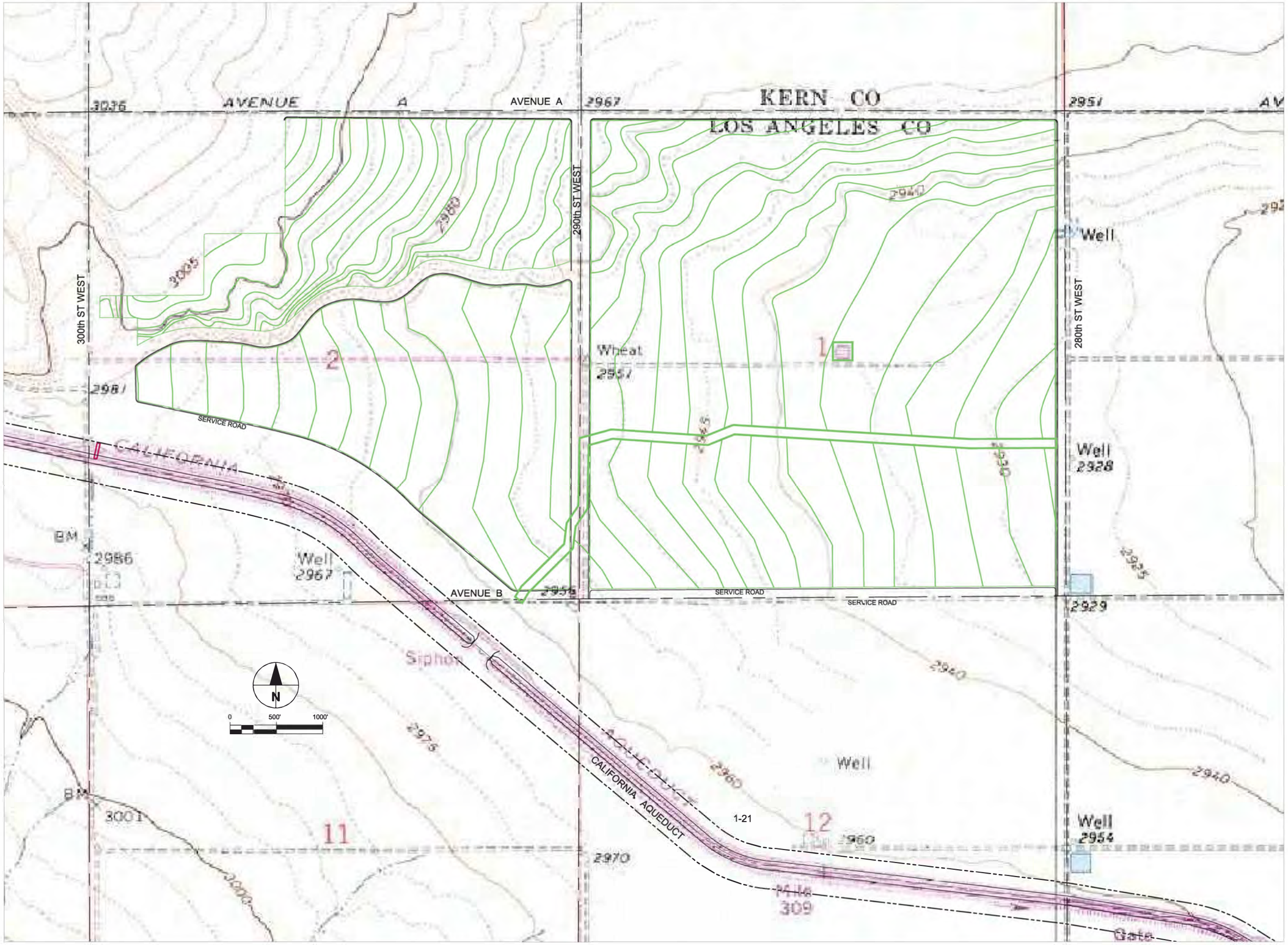
Appendix A Site Plans



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A PUBLIC AGENCY

ISSUE/REVISION

I/R	DATE	DESCRIPTION
	YYYY-MM-DD	

PROJECT

HIGH DESERT WATER
BANK

PROJECT NUMBER

60537613

SHEET TITLE

ORIGINAL SCHEMATIC FLOOD
RECHARGE OPERATIONS

SHEET NUMBER

FIGURE 2

ANSI D 22" x 34"

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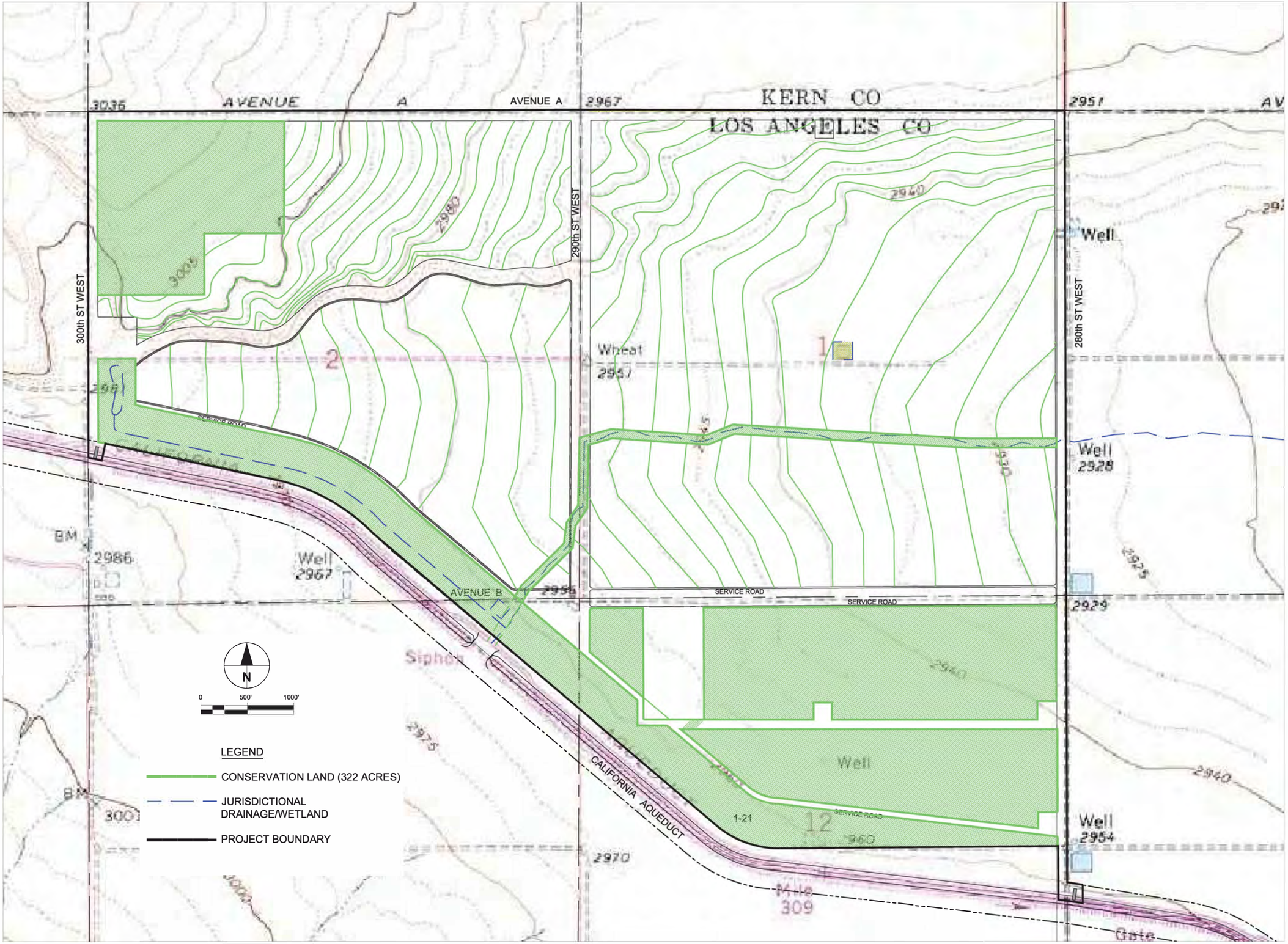

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REGISTRATION

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A PUBLIC AGENCY

ISSUE/REVISION

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PROJECT

HIGH DESERT WATER BANK

PROJECT NUMBER

60537613

SHEET TITLE

ORIGINAL CONSERVATION PLAN

SHEET NUMBER

FIGURE 13

ANSI D 22" x 34"

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Appendix B Site Photographs

Photograph 1: From the northeast corner of the project site looking west along the northern boundary.

Photograph 2: From the northeast corner of the project site looking south along the eastern boundary.

Photograph 3: From the southeast corner of the project site looking north along the eastern boundary.

Photograph 4: From the southeast corner of the project site looking west along the southern boundary.

Photograph 5: From the southwest corner of the project site looking east along the southern boundary.

Photograph 6: From the southeast corner of the project site looking north along the western boundary.

Photograph 7: Representative photograph of the fallow agriculture supported in the northwest portion of the project site.

Photograph 8: Rubber rabbitbrush scrub occurs throughout the project site in varying densities.

Photograph 9: A small patch of sandbar willow thicket grows adjacent to the pump station water basin.

Photograph 10: Non-native grassland occurs throughout the project site.

Photograph 11: Disturbed land occurs throughout the site. This area supports suitable burrows for roosting by burrowing owls.

Photograph 12: Rubber rabbitbrush scrub surrounding remnant foundations from historic agricultural activities.

Appendix C Potentially Occurring Special-Status Biological Resources

Table C-1: Potentially Occurring Special-Status Biological Resources

Scientific Name Common Name	**Status**	**Habitat Description**	**Observed On-site**	**Potential to Occur**
SPECIAL-STATUS WILDLIFE SPECIES				
Agelaius tricolor tricolored blackbird	Fed: None CA: **THR**; SSC	Highly colonial yearlong resident of California that frequents emergent wetlands, croplands, grassy fields, flooded land and along edges of ponds. Usually nests near fresh water, preferably in emergent wetland with tall, dense cattails (*Typha sp.*) or tules (*Schoenoplectus sp.*), but also in thickets of willow (*Salix sp.*), blackberry (*Rubus sp.*), and tall herbs.	No	**Low** There is no suitable habitat present within the project site; however, suitable habitat is present outside of site boundaries beyond the California Aqueduct. No suitable nesting habitat is present on-site.
Anniella pulchra northern California legless lizard	Fed: None CA: SSC	Occurs primarily in areas with sandy or loose loamy soils under sparse vegetation of beaches, chaparral, or pine-oak woodland; or near sycamores, oaks, or cottonwoods that grow on stream terraces. Often found under or in the close vicinity of logs, rocks, old boards, and the compacted debris of woodrat nests.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.
Aquila chrysaetos golden eagle	Fed: None CA: FP; WL	Occupies nearly all terrestrial habitats of the western states except densely forested areas. Favors secluded cliffs with overhanging ledges and large trees for nesting and cover. Hilly or mountainous country where takeoff and soaring are supported by updrafts is generally preferred to flat habitats. Deeply cut canyons rising to open mountain slopes and crags are ideal habitat.	No	**Low** The project site provides limited foraging habitat. Suitable nesting habitat may be found in the mountains to the south.
Aspidoscelis tigris stejnegeri coastal whiptail	Fed: None CA: SSC	Found in a variety of ecosystems, primarily hot and dry open areas with sparse foliage such as chaparral, woodland, and riparian areas.	No	**Low** The project site provides limited foraging and cover habitat.
Athene cunicularia burrowing owl	Fed: None CA: SSC	Prefers habitat with short, sparse vegetation with few shrubs and well-drained soils in grassland, shrub steppe, and desert habitats. Primarily a grassland species, but it persists and even thrives in some landscapes highly altered by human activity. Occurs in open, annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. The overriding characteristics of suitable habitat appear to be burrows for roosting and nesting and relatively short vegetation with only sparse shrubs and taller vegetation.	No	**High** The project site provides line-of-sight opportunities favored by burrowing owls. In addition, the site supports suitable burrows (>4 inches in diameter) for roosting. No burrowing owls and/or sign were observed during the field investigation.

Scientific Name Common Name	**Status**	**Habitat Description**	**Observed On-site**	**Potential to Occur**
Bombus crotchii Crotch bumble bee	Fed: None CA: CE	Colonial species that lives almost exclusively from coastal California east towards the Sierra-Cascade Crest and can be found uncommonly in western Nevada and south through Baja California. Inhabits grassland and scrub habitats in hotter and drier climates than most other bumblebee species and is only capable of tolerating a narrow range of climatic conditions. Feeds on a variety of annual and perennial plant species, classifying it as a dietary generalist. This species usually nests underground, often in abandoned rodent dens.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.
Buteo regalis ferruginous hawk	Fed: None CA: WL	Occurs primarily in open grasslands and fields, but may be found in sagebrush flats, desert scrub, low foothills, or along the edges of pinyon-juniper woodland. Feeds primarily on small mammals and typically found in agricultural or open fields.	No	**High** The project site provides suitable foraging habitat. Suitable nesting habitat may be found in the mountains to the south.
Lanius ludovicianus loggerhead shrike	Fed: None CA: SSC	Prefers open habitats with bare ground, scattered shrubs, and areas with low or sparse herbaceous cover including open-canopied valley foothill hardwood, riparian, pinyon-juniper, desert riparian, creosote bush scrub, and Joshua tree woodland. Requires suitable perches including trees, posts, fences, utility lines, or other perches.	Yes	**Present** Suitable foraging and nesting habitat are present within the project site.
Perognathus alticola inexpectatus Tehachapi pocket mouse	Fed: None CA: SSC	Occurs in native and non-native grasslands, Joshua tree woodland, pinyon-juniper woodland, yellow pone woodland, and oak savannah. Constructs burrows in loose, sandy soil.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.
Phrynosoma blainvillii coast horned lizard	Fed: None CA: SSC	Occurs in a wide variety of vegetation types including coastal sage scrub, annual grassland, chaparral, oak woodland, riparian woodland and coniferous forest. In inland areas, this species is restricted to areas with pockets of open microhabitat, created by disturbance (i.e. fire, floods, roads, grazing, fire breaks). The key elements of such habitats are loose, fine soils with a high sand fraction; an abundance of native ants or other insects; and open areas with limited overstory for basking and low, but relatively dense shrubs for refuge.	No	**Low** The project site provides suitable foraging habitat and limited burrowing habitat. Soils on-site are generally too compact and rocky, for burrowing.
Plegadis chihi white-faced ibis	Fed: None CA: WL	Prefers to feed in fresh emergent wetland, shallow lacustrine waters, muddy ground of wet meadows, and irrigated or flooded partures and croplands. Nests in dense, fresh emergent wetland.	No	**Low** There is no suitable habitat present within the project site; however, suitable habitat is present outside of site boundaries beyond the California Aqueduct. No suitable nesting habitat is present on-site.

Scientific Name Common Name	**Status**	**Habitat Description**	**Observed On-site**	**Potential to Occur**
Setophaga petechia yellow warbler	Fed: None CA: SSC	Nests over all of California except the Central Valley, the Mojave Desert region, and high altitudes and the eastern side of the Sierra Nevada. Winters along the Colorado River and in parts of Imperial and Riverside Counties. Nests in riparian areas dominated by willows, cottonwoods, sycamores, or alders or in mature chaparral. May also use oaks, conifers, and urban areas near stream courses.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.
Taxidea taxus American badger	Fed: None CA: SSC	Primarily occupy grasslands, parklands, farms, tallgrass and shortgrass prairies, meadows, shrub-steppe communities and other treeless areas with sandy loam soils where it can dig more easily for its prey. Occasionally found in open chaparral (with less than 50% plant cover) and riparian zones.	No	**Low** The project site provides limited foraging and burrowing habitat.
Xanthocephalus xanthocephalus yellow-headed blackbird	Fed: None CA: SSC	Uncommon yearlong resident of southern California throughout freshwater emergent wetlands, and moist, open areas along agricultural areas, and mudflats of lacustrine habitats. Prefers to nest in dense wetland vegetation characterized by cattails, tules, or other similar plant species along the border of lakes and ponds.	No	**Low** There is no suitable habitat present within the project site; however, suitable habitat is present outside of site boundaries beyond the California Aqueduct. No suitable nesting habitat is present on-site.
SPECIAL-STATUS PLANT SPECIES				
Androsace elongata* ssp. *acuta California androsace	Fed: None CA: None CNPS: 4.2	Occurs in chaparral, cismontane woodland, coastal scrub, meadows and seeps, pinyon and juniper woodland, and valley and foothill grasslands. Found at elevations ranging from 492 to 4,280 feet. Blooming period is from March to June.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.
Calochortus palmeri* var. *palmeri Palmer's mariposa-lily	Fed: None CA: None CNPS: 1B.2	Occurs in meadows and seeps, chaparral, and lower montane coniferous forest in vernally moist places. From 3,281 to 7,841 feet in elevation. Blooming period is from April to July.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site. The project site occurs outside of the known elevation range for this species.
Chorizanthe spinosa Mojave spineflower	Fed: None CA: None CNPS: 4.2	Grows in alkaline or non-alkaline soils in chenopod scrub, Joshua tree woodland, Mojavean desert scrub, and playas. Found at elevations ranging from 20 to 4,265 feet. Blooming period is from March to July.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.
Delphinium parryi* ssp. *purpureum Mt. Pinos larkspur	Fed: None CA: None CNPS: 4.3	Grows in chaparral, Mojavean desert scrub, and pinyon and juniper woodlands. Found at elevations ranging from 3,280 to 8,530 feet. Blooming period is from May to June.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site. The project site occurs outside of the known elevation range for this species.
Goodmania luteola golden goodmania	Fed: None CA: None CNPS: 4.2	Grows on alkaline or clay soils within Mojavean desert scrub, meadows and seeps, playas, and valley and foothill grassland habitats. Found at elevations ranging from 70 to 7,220 feet. Blooming period is from April to August.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.

Scientific Name Common Name	**Status**	**Habitat Description**	**Observed On-site**	**Potential to Occur**
Microseris sylvatica sylvan microseris	Fed: None CA: None CNPS: 4.2	Grows within chaparral, cismontane woodland, Great Basin scrub, pinyon and juniper woodland and valley and foothill grassland (serpentine) habitats. Found at elevations ranging from 150 to 4,920 feet. Blooming period is from March to June.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.
Muhlenbergia utilis aparego grass	Fed: None CA: None CNPS: 2B.2	Native to north and central America. Grows in wet habitats, including riverbanks and meadows, sometimes alkaline soils. Found at elevations ranging from 25 to 2,325 feet. Blooming period is from October to March.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.
Perideridia pringlei adobe yampah	Fed: None CA: None CNPS: 4.3	Grows in serpentinite, often clay soils in chaparral, cismontane woodland, coastal scrub, and pinyon-juniper woodlands. Blooming period is from April to June or July, depending on seasonal rainfall. Grows in elevation from 984 to 5,906 feet.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.
Syntrichopappus lemmonii Lemmon's syntrichopappus	Fed: None CA: None CNPS: 4.3	Occurs in sandy or gravelly soils within chaparral, Joshua tree woodland, and Pinyon and juniper woodland habitats. Found at elevations ranging from 1,640 to 6,004 feet above msl. Blooming period is from April to May (June).	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.
Yucca brevifolia western Joshua tree	Fed: None CA: **CE** CNPS: N/A	Occurs in a variety of arid habitats within the Mojave Desert. Found at elevations ranging from 1,600 to 6,600 feet. Blooming period is from March to June.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.
SPECIAL-STATUS PLANT COMMUNITIES				
Southern Cottonwood Willow Riparian Forest	CDFW Sensitive Habitat	Dominated by cottonwood (*Populus* sp.) and willow (*Salix* sp.) trees and shrubs. Considered to be an early successional stage as both species are known to germinate almost exclusively on recently deposited or exposed alluvial soils.	No	**Absent**
Southern Riparian Scrub	CDFW Sensitive Habitat	Riparian zones dominated by small trees or shrubs, lacking taller riparian trees.	No	**Absent**
Valley Needlegrass Grassland	CDFW Sensitive Habitat	Occur as patches of native grasslands within valleys. Dominated by perennial bunch grasses with herbaceous annuals intermixed. Supports early successional sub-shrub and suffrutescent species.	No	**Absent**
Valley Oak Woodland	CDFW Sensitive Habitat	Habitat varies from savanna-like to forest-like with partially closed canopies. Dominated almost exclusively by valley oak and comprised mostly of winder-deciduous, broad-leaved species.	No	**Absent**

U.S. Fish and Wildlife Service (Fed) - Federal
END – Federal Endangered
THR – Federal Threatened
DL - Delisted

California Department of Fish and Wildlife (CA) - California
END – California Endangered
THR – California Threatened
CTHR – California Candidate Threatened
DL - Delisted

California Native Plant Society (CNPS) - *California Rare Plant Rank*
1B Plants Rare, Threatened, or Endangered in California and Elsewhere
2B Plants Rare, Threatened, or Endangered in California, but More Common

Threat Ranks
0.2- Moderately threatened in California
0.3- Not very threatened in California

FP – California Fully Protected
SSC – California Species of Special Concern
WL – California Watch List
CE – Candidate Endangered

Elsewhere
4 Plants of Limited Distribution – A Watch List

Appendix D Mitigation Monitoring and Reporting Program

Antelope Valley – East Kern Water Agency

High Desert Water Bank

California Environmental Quality Act (CEQA)

Mitigated Negative Declaration

SCH No. 2017061030

Mitigation Monitoring and Reporting Program

December 2017

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1. General

The Mitigated Negative Declaration (MND) for the Antelope Valley – East Kern Water Agency (AVEK or Agency) High Desert Water Bank (the Project) specified a number of mitigation measures to be undertaken during implementation of the proposed project. During implementation, it is essential that all of these be fully complied with and that compliance be documented in a timely manner. Failure to comply with and or document compliance could result in a challenge to the project that could result in project delays.

This Mitigation Monitoring and Reporting Program (MMRP) has been prepared for the project and has been adopted concurrently with the findings of the Initial Study and Mitigated Negative Declaration. This plan is intended to track compliance of all of the mitigation measures adopted with the Mitigated Negative Declaration.

2. Responsibility for Compliance and Documentation

Implementation of the MMRP will be the responsibility of the Agency. The Agency will assign a project manager to oversee all aspects of implementation of the proposed project and ensure that the mitigation and monitoring commitments made in the MND are carried out in a timely and effective manner. In implementing the MMRP, the Agency will often rely on the expertise of outside consultants and contractors. To ensure the effectiveness of this mitigation and monitoring, the Agency will:

- Make the MMRP an element of all project-related requests for proposals and contract specifications, specifying that construction contractors will be responsible for appropriate acquisition of permits for construction and implementation of relevant mitigation and monitoring elements, as specified in this MMRP;
- Independently review contractor compliance on a regular basis and require corrective actions in a timely manner when the Agency determines that such actions are required;
- Maintain files, open to the public for inspection, documenting compliance with the MMRP;
- Designate an Agency staff member to receive and respond to all public and Agency comments, complaints, and/or questions regarding compliance with the MMRP; and
- Provide regulatory agencies with appropriate and timely documentation of compliance as specified in regulatory permits issued for the proposed project.

Additionally, the Agency will require that construction contractors designate a principal mitigation and monitoring manager (Principal) and back-up mitigation and monitoring manager (Alternate) and shall ensure that at least one of these is on-site during all phases of construction. These persons may perform other tasks, but shall have adequate time, training, and expertise to perform the required monitoring and documentation. The Principal shall be the contractor's construction field supervisor or assistant field supervisor. The Principal or Alternate shall independently verify compliance with required mitigation measures and shall indicate verification by filling out and signing the appropriate compliance checklist, thereby certifying compliance with all measures.

3. Permits and Coordination

The MND identifies a number of permits which may need to be obtained for various aspects of the Proposed Project, as well as commitments to coordinate design, pre-construction, and

construction activities with various local, regional, State, and Federal agencies. Permits and coordination commitments are:

- Encroachment Permits for any work within Public Right of Way.
- National Pollutant Discharge Elimination System Construction Activities General Permit.
- Department of Water Resources Turnout Construction and Operations Permit.
- Department of Water Resources Encroachment Permit (if needed)
- Caltrans heavy or oversized equipment Transportation Permit (if needed).

4. Incidents and Compliance Reporting

Timely reporting of compliance and of any incidents which may result in non-compliance is essential. Contracts for construction and for independent compliance contractors shall therefore specify that, if the designated construction contractor for an activity determines that any aspect of construction is not in substantive compliance with the mitigation requirements for the activity, the contractor shall immediately take action to remedy the problem. The designated Principal or Alternate shall notify the Agency within not more than 24 hours following determination that any aspect of construction activity is not in compliance with mitigation requirements, shall explain how the incident has been addressed, and shall provide any other information requested by the Agency. Following action to address the out-of-compliance incident, the designated Principal or Alternate must complete an "incident report" and submit a copy of the report to the Agency's project manager within one week of the incident.

5. Mitigation and Monitoring Program Update

The Agency recognizes that laws, regulations, and policies related to construction activities may change during construction. The Agency's project manager is responsible for periodically reviewing the status of laws, regulations, and guidelines applicable to their construction activity. The Agency will implement any new rules in effect at the time of approval.

6. Staff Awareness

Staff must be informed of mitigation and monitoring requirements prior to construction. New staff must be oriented when they come on site. The Principal/Alternate therefore needs to review compliance requirements and monitoring requirements for the job with all personnel on site to ensure that they know the requirements, know the importance of compliance, know that violations must be reported, and know that compliance is a condition of employment on this job. Similarly, a summary list of mitigation and monitoring requirements shall be posted in a conspicuous location at the job site so that they may be referred to at any time.

7. Training

If specialized expertise is necessary for mitigation or monitoring, Agency staff or the delegated construction contractor shall provide such training to the persons responsible for compliance and/or monitoring. For example, if biological pre construction surveys identify the presence of a special status species, the Agency shall retain the services of a qualified biologist familiar with this species to provide environmental training for the identification and protection of same.

8. On Going Documentation

Compliance will be monitored on a timely basis, depending on the nature of the activity and the

Mitigation requirement. Where appropriate. photo documentation of pre-construction conditions, of activities during construction, of any incidents that may constitute a violation of mitigation requirements, and of post construction conditions are encouraged. However, if photo documentation is adopted as a monitoring tool, it must be used consistently to ensure that there are records of all activities for which compliance must be documented. Labels must be explanatory and contain adequate information about the photographer, date, time, and conditions when the photo was taken. Photo documentation shall be backed up with paper copies and/or records on CD/DVD. Agency staff may audit records of compliance with mitigation and monitoring requirements at any time and compliance records must be readily available and in good order. Logs of mitigation and monitoring compliance should be maintained and supporting documentation should be provided in parallel to the log. The Agency and its project manager and other contractors will maintain such records in a form suitable for the required monitoring and reporting. It is anticipated that contractors will generally have appropriate monitoring templates for typical construction activities. In other cases, the format of compliance monitoring records may be available from the regulatory Agency approving the monitoring (if any).

9. Pre-Construction Training

Prior to initiation of construction activity, the Agency will review the mitigation commitments in this MMRP and will determine the need for pre-construction training. The Agency and its contractors will prepare appropriate training materials and provide appropriate training to construction staff to ensure that they fully understand compliance and reporting requirements. It is anticipated that pre-construction training may be necessary for the following:

- Activities that involve excavation (cultural, biological, dust, noise, traffic)
- Activities that involve use of heavy equipment (dust, noise)
- Activities in the vicinity of trees (biological)
- Activities in the vicinity of public and private utilities

10. Mitigation and Monitoring Requirements

The following includes a list of all of the mitigation measures identified in the MND.

AGRICULTURAL RESOURCES

AG-1: Prime Farmland Avoidance – The Agency will not perform recharge operations on the 60 acres of semi active farmed Prime Farmland on the northwest corner of the property.

AIR QUALITY

AQ-1: Minimization Measure for NOx Related Emissions - Construction contractor shall use off road construction diesel engines that meet, at a minimum, the Tier 4 interim California Emissions Standards, unless such an engine is not available for a particular item of equipment. Tier 3 engines will be allowed on a case by case basis when the contractor has documented that no Tier 4 interim equipment or emissions equivalent retrofit equipment is available for a particular equipment type that must be used to complete construction. Documentation shall consist of signed written statements from at least two construction equipment rental firms.

BIOLOGICAL RESOURCES

BIO-1 : Burrowing Owls – Prior to ground-disturbing activities and other habitat disturbance, clearance surveys for active burrowing owl burrows shall be conducted of all areas subject to disturbance. Prior to ground-disturbance associated with construction of the Project, including vegetation clearance and grubbing, preconstruction clearance surveys shall be conducted by a

qualified biologist within the Project site and a 500-foot buffer of the site in order to locate active burrowing owl burrows. Pre-construction clearance surveys shall be conducted no more than two (2) weeks prior to construction. Surveys will be conducted following guidelines provided in the *Staff Report on Burrowing Owl Mitigation* (CDFW 2012).

Within two (2) weeks prior to inundation, trained AVEK personnel shall review all areas subject to inundation for presence of burrows with entrances suitable for burrowing owl occupation and potential burrowing owl sign. Any identified potentially occupied burrows will be investigated further by a qualified biologist prior to inundation. Training will be conducted by a qualified biologist for AVEK personnel who conduct pre-inundation surveys prior to the commencement of the first inundation survey. Training will discuss burrowing owl identification and sign and burrow recognition, their status, and the laws governing their protection. Training will be conducted by a qualified biologist on an annual basis for all Project operations personnel as a refresher.

If no burrowing owls are detected, no further mitigation will be required. If burrowing owls are observed during any survey, the following measures will be implemented:

- Occupied burrows will not be disturbed during the nesting season (April 1 through October 15).
- Occupied burrows will not be subject to inundation during operation of the water bank.
- Avoidance shall be the preferred approach for occupied burrows whenever feasible. If occupied burrows are observed during the non-breeding season (October 16 through March 31), a 160-foot buffer will be established; no construction or other physical work activities will occur within the buffer. If occupied burrows are observed during the breeding season (April 1 through October 15), and a 650-foot buffer shall be established; no construction or other physical work activities will occur within the buffer.
- When destruction of occupied burrows is unavoidable, destruction shall occur only during the non-nesting season (October 16 through March 31). Prior to destruction of occupied burrows within the Project site, any unsuitable burrows outside the disturbance footprint will be enhanced (enlarged, cleared of debris) to facilitate occupation.
- If owls must be moved away from the Project area, passive relocation techniques (e.g., installation of one-way exclusion doors at burrow entrances) will be used instead of trapping. ~~A~~ Passive relocation techniques will be employed for a minimum of one week in order to allow owls to acclimate to alternate burrows.

In order to provide protections for burrowing owls throughout construction and operations of the Project, a Burrowing Owl Protection Plan shall be developed prior to construction of the recharge basins. This plan will provide acceptable strategies for avoiding and minimizing impacts to burrowing owls and burrowing owl habitat on the Project site.

BIO-2 : Desert Kit Fox and American Badger – Clearance surveys for occupied desert kit fox and American badger dens shall be conducted prior to any Project disturbance activities, including initial construction and ongoing operations such as inundation of the recharge basins.

Within two (2) weeks prior to the start of construction, a qualified biologist shall conduct pre-construction clearance surveys of the work area and a 150-foot buffer for signs of desert kit fox and American badger, including active and inactive natal and non-natal dens, scat, prey remains, and tracks. All suitable denning locations shall be investigated for use.

Within two (2) weeks prior to inundation of the basins, trained AVEK personnel shall review all areas subject to inundation for potential sign of American badger or desert kit fox, including active and inactive natal and non-natal dens. Any identified potential sign of presence will be investigated further by a qualified biologist prior to inundation. Training will be conducted by a qualified biologist for AVEK personnel who conduct pre-inundation surveys prior to the commencement of the first inundation survey. Training will discuss American badger and desert kit fox identification and sign and den recognition, their status, and the laws governing their protection. Training will be conducted by a qualified biologist on an annual basis for all Project operations personnel as a refresher.

If dens are observed, the following measures will be implemented:

- Occupied dens will not be subject to inundation during operation of the water bank.
- Inactive dens shall be excavated by hand with a shovel to prevent badgers/kit foxes from re-using dens during construction.
- If active natal dens are observed during the survey, a buffer of 300 feet shall be established around the den; no construction or work activities will occur within the buffer. The den shall be monitored and the buffer maintained until a qualified biologist has determined that the den is no longer active, at which time it shall be excavated by hand to prevent re-use. Passive relocation of American badger and desert kit fox shall not take place while young are still in dens and dependent on the parents for food, or while females may be pregnant.
- If active, non-natal dens are observed within the Project site or buffer, badgers/kit foxes shall be discouraged from using these dens prior to clearing, grubbing, and/or grading of the site, by partially blocking the entrance of the den with sticks, debris, and soil for 3 to 5 days. Access to the den shall be incrementally blocked to a greater degree over this period, encouraging the badger/kit fox to vacate the den of its own volition. After badgers/kit foxes have stopped using active dens within the Project boundary, the dens shall be hand-excavated with a shovel to prevent re-use.
- If newly active badger/kit fox dens are found during construction activities, all work in the area shall cease until the biologist can safely close the den.
- If a desert kit fox or American badger is encountered during Project activities, all work that could result in a direct injury, disturbance, or harassment shall immediately stop and the Project biologist shall be notified.
- Where desert kit foxes have the potential to occur, all heavy equipment and vehicles left on-site overnight will be inspected at the beginning of each work day to verify that no individuals have taken shelter under the equipment. If a desert kit fox is observed, the project biologist shall be notified and the animal shall be observed from a distance until it has moved out of the area of its own accord.

BIO-3 : Nesting Birds - If construction activities occur within the breeding bird season (February 1 through September 15), all vegetation clearing and initial ground disturbing activities will be preceded by a nesting bird survey. Nesting bird surveys will be conducted by a qualified biologist of all areas that may support nesting and will be subject to disturbance, as well as a 300-foot buffer for passerine species and 500-foot buffer for raptors. Surveys will be conducted no more than 7 days prior to construction activities.

- If an active nest is observed, a no-disturbance buffer will be established until a qualified biologist has determined the nest has either failed or has successfully fledged and the young are no longer dependent on the nest. The no-disturbance buffer will measure no less than 500 feet for raptors, and 300 feet for all other species.

BIO-4 : Animal Movement and Entrapment (Trenches) - All trenches that are to be left open overnight shall be either securely covered or have wildlife escape ramps installed during non-work hours to prevent entrapment of common and special-status wildlife species. All steep-walled pipeline and utility trenches shall be inspected in the mornings and prior to backfilling to prevent mortality of common and special-status wildlife species. All entrapped wildlife shall be removed or allowed to escape voluntarily via escape ramps prior to construction resuming.

BIO-5 : Animal Movement and Entrapment (Pipes) – All pipes, culverts, or similar structures on-site with a diameter of 2 to 24 inches shall be inspected for special-status species prior to moving or welding. Openings shall be capped or otherwise covered if sections cannot be inspected to prevent the entry and potential loss of wildlife. If a common or special-status species is discovered inside a pipe, the animal shall be safely removed by a qualified biologist. The pipe segment shall not be moved until the animal has escaped, or the pipe segment shall be moved a single time out of the path of construction. Alternatively, stored pipe may be kept capped at all times until used during construction. Vertical, open-ended pipes used as fence posts, property line demarcations, sign posts, etc., will be capped or otherwise plugged to prevent the entrapment and possible injury and mortality of wildlife.

BIO-6 : Erosion and Sediment Control - Best available erosion and sediment control measures will be employed to prevent downstream dispersal of sediments during and following Project-related activities. These measures may include sediment basins, gravel bags, silt fences, geo-bags, or gravel and geotextile fabric berms, erosion control blankets, coir rolls, jute net, and straw bales. The use of erosion control materials potentially harmful to wildlife species, including monofilament netting (erosion control matting) or similar material, will not be employed.

BIO-7 : Special-Status Plants - Prior to construction of the recharge basins, floristic surveys shall be conducted of all potentially suitable habitats on the Project site. Floristic surveys shall be conducted by a qualified biologist following CDFW's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFW 2009). If no special-status plants are observed, no further mitigation will be necessary. If special-status plants are observed during surveys, the following measures will be implemented:

- Individuals will be protected in place to the extent feasible through implementation of avoidance and buffers.
- If special-status plant individuals or populations must be impacted, individuals will be salvaged and/or transplanted to suitable habitat within the established on-site habitat management lands. If salvage is not feasible, mitigation at a 2:1 ratio will be provided within habitat management lands. In the case of annual species, top soil salvage may be employed to preserve the existing seed bank where appropriate enhancement of existing populations may be employed at the same 2:1 ratio.

BIO-8 : Swainson's Hawk - Prior to construction of the recharge basins, focused Swainson's hawk surveys shall be conducted. Surveys for Swainson's hawk shall be conducted by a qualified biologist following the methods outlined in Swainson's Hawk Survey Protocols, Impact Avoidance, and Minimization Measures for Renewable Energy Projects in the Antelope Valley of Los Angeles and Kern Counties, California (CDFW 2010). Surveys shall include all potential Swainson's hawk nesting habitat within a 5 mile radius of the Project site. Surveys shall include all potential nest trees, towers or other potential nest sites (including nests used within the last 5 years) outside the nesting season for Swainson's hawk.

If no active Swainson's nests are observed, no further mitigation will be necessary. If an active Swainson's hawk nest is detected during focused surveys, the following measures will be

implemented:

- No removal of active Swainson's hawk nests will be conducted during Project construction and/or operations.
- No construction activities will be conducted within a 0.5-mile radius of an active Swainson's hawk nest. Prior to construction activities, a qualified biologist will conduct a focused Swainson's hawk nest survey within an up to 0.75-mile radius of proposed construction activities to identify any active nests.
- If active Swainson's hawks nests are identified within a 0.5-mile radius of the Project site, a Habitat Management Plan will include specific, detailed measures to avoid and minimize impacts to Swainson's hawks in or near the Project site during both construction and operation of the Project.

BIO-9 : Tri-colored Blackbirds - While the Initial Study indicates that impacts to tricolored blackbird foraging habitat due to Project-related activities are less than significant, at the request of the CDFW focused nesting season surveys will be conducted as follows: Prior to construction of the recharge basins, focused nesting tri-colored blackbird surveys shall be conducted of all potentially suitable nesting habitats and documented nesting colonies within the Project site and within a 3-mile radius of the Project site for any active nesting colonies.

BIO-10 : Jurisdictional Drainages and Wetlands - Prior to construction of the recharge basins or any ground-disturbing activities within waterways and wetlands on the site, a formal Jurisdictional Delineation will be conducted of all potential jurisdictional waters within the Project site. Fill or disturbance of any jurisdictional waters or wetlands will be permitted through the appropriate agency (i.e., Sections 401 and 404 of Clean Waters Act, or Section 1600 of California Fish and Game Code). Impacts to jurisdictional waters and wetlands will be avoided to the extent feasible, and shall not occur prior to issuance of any required local, state, and federal permits.

BIO-11 : Habitat Mitigation - AVEK will designate a significant allotment of land as habitat management lands. The purpose of these areas is to provide foraging habitat for Swainson's hawk, tricolored blackbird, nesting and foraging habitat for burrowing owl, and denning and foraging habitat for desert kit fox and American badger. The details of the management of these lands shall be described in a *Habitat Management Plan* to be prepared prior to construction of the recharge basins.

BIO-12 : General Biological Measures –

Worker Environmental Awareness Training - Prior to construction, a Worker Environmental Awareness Training shall be prepared and presented by a qualified biologist to all construction personnel at the start of Project-related activities. The training shall discuss sensitive-status species with the potential to occur within the Project footprint, including their regulatory status, description, and habitat requirements, and any sensitive habitat areas that may be encountered. The program shall emphasize the importance of minimizing disturbance, and describe the federal, state, and local regulations protecting biological resources and the potential penalties for non-compliance with these laws and statutes.

Equipment Staging - All construction equipment, staging areas, materials and personnel shall be restricted to existing roadways and road shoulders, designated work areas, or previously disturbed off-site areas that are not habitat for special-status species.

Site Cleanliness - All trash and food items shall be contained and removed from the site regularly to prevent attracting predators and scavengers, such as dogs, coyotes, desert kit fox, or common ravens, to the Project area.

Hazardous Waste Cleanup - Any spills of petroleum products or other chemicals, which may represent a hazard to wildlife, shall be cleaned up promptly and in accordance with appropriate laws and regulations.

CULTURAL RESOURCES

CR-1: Cultural Resources Monitoring – The Project site has been identified to have a low to moderate potential of finding significant archaeological resources lacking surface manifestations that may be encountered during Project construction. To lessen the impact of unknown archeological resources, the Agency will develop a Cultural Resources Monitoring and Mitigation Plan prior to start of ground disturbance. This plan will implement part time monitoring by a qualified archeologist and or a Native American Monitor. In the event that project construction activities result in a finding of significant importance, the qualified archeologist may increase the level of monitoring. If no findings occur during the part time monitoring, the archeologist may further reduce or eliminate the monitoring. During a find of a potentially significant archaeological resource, the resource will be inventoried and evaluated to ascertain whether the resource meets the criteria for listing on the California Register of Historical Resources. After the discovery, all work being conducted within the vicinity of the discovery will be halted or diverted away from the site of discovery until a qualified archaeologist can assess the potential significance of the find.

CR-2: Regulation Compliance – The Agency will comply with Health and Safety Code Section 7050.5, CEQA Section 15064.S(e), and Public Resources Code Section 5097.98, which mandate the process to be followed in the unlikely event of an accidental discovery of any human remains in a location other than a dedicated cemetery.

GEOLOGY AND SOILS

GEO-1: SWPPP - To control water and wind erosion during construction and operation of the Project, the Agency will prepare a Stormwater Pollution Prevention Plan (SWPPP) in compliance with the requirements of the National Pollutant Discharge Elimination System (NPDES) Construction General Permit.

GEO-2: Seismic Design - Although the proposed Project has little inherent potential for causing seismic safety effects, the Agency will ensure that all facilities are designed to withstand the anticipated seismic forces, consistent with local and State building codes and relevant regulations.

GEO-3: Pipeline Shut Off Valves - The Agency will install shut off valves on major pipelines to minimize the potential for flooding during seismic events.

GEO-4: Groundwater Monitoring Plan - Although the potential for the Project to raise groundwater levels to within 30 to 50 feet of the ground surface is small, to address potential impacts to local groundwater levels, the Agency will develop a monitoring program to monitor changes in water levels in the area affected by groundwater recharge operations. If monitoring identifies groundwater level rise to 75 feet below ground surface, the Agency will modify management of recharge to prevent water levels from rising to levels where liquefaction effects could occur. The Groundwater Monitoring Plan will also include provisions for monitoring of groundwater quality and the development of a native groundwater quality baseline which would be identified prior to commencement of recharge operations.

HAZARDS AND HAZARDOUS MATERIALS

HAZ-1: Spill Prevention Plan - Consistent with Agency's existing practices, the Agency will require from its construction contractors the preparation and implementation of a Spill Prevention Control and Countermeasures Plan (SPCCP) to minimize the potential for, and effects from, spills of hazardous, toxic, or petroleum substances during construction activities and operations. The plan and methods shall be in conformance with all State and Federal regulations. The Agency shall provide for routine inspection of the construction and operations areas to verify that the measures specified in the SPCCP are properly implemented and maintained and further ensure that contractors are notified immediately if there is a noncompliance issue and will require compliance.

HAZ-2 : Bird Strike Hazard Notification - The Agency will notify the Flight Safety Office at Edwards Air Force Base and all local airports of the potential bird strike hazard as follows:

- Prior to application of water to the recharge basins, and
- If large birds or large concentrations of small birds are observed in or near the recharge area.

HAZ-3: Bird Strike Hazard Minimization Measures - The Agency will implement actions to reduce the attractiveness of the recharges basins to birds by:

- Use of recharge basins with shallow water depths which will be generally unsuitable for the larger migratory birds,
- Monitor recharge area water and if aquatic macroinvertebrates are found to be developing in large numbers and/or foraging by shorebirds is observed, temporarily dry out recharge areas, thereby reducing the insect and aquatic macroinvertebrate forage that would attract and hold shorebirds.
- Whenever water is present in the recharge basins, the project operator will monitor the basins daily for bird activity and if found discourage their use via means acceptable to the Department of Fish and Game.

HAZ-4: Mosquito Borne Disease Minimization Measures – The Agency will consult with the Antelope Valley Mosquito and Vector Control District to develop and implement a mosquito management plan. The plan would consist of a Project specific mosquito abatement program that would include quantitative abatement thresholds. The Agency and/or its representative would monitor mosquito larvae production in the recharge basins, drainages, and distribution. Larvae populations would be tracked using methods and thresholds approved by the Mosquito Abatement District, and suppression measures would be employed when thresholds are exceeded. The primacy mode of suppression would be to monitor for mosquito presence and if mosquito larvae are found, to cycle recharge temporarily so that units of recharge would be dried.

HYDROLOGY AND WATER QUALITY

HWQ-1: Drainage Design - Recharge areas will be constructed so that they will not divert sheet flooding and other runoff away from the recharge areas. This will allow flood water to flow into the recharge areas where flows will be somewhat retarded by the recharge berms. Berms will be designed with berm heights below the calculated flood depth elevations and intended to be sacrificial. Flood flows would enter the site, go through the berms, overtop or destroy the

berms in sequence, and eventually exit the project site along the eastern boundary of the proposed project in a manner similar to pre-project conditions.

HWQ-2: **Stormwater Pollution Prevention Plan (SWPPP)** - To reduce or eliminate Construction related water quality effects, before onset of any construction activities, the Agency or its contractor will prepare a Storm Water Pollution Prevention Plan. The SWPPP will include temporary erosion control measures (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover). These measures will be employed to control erosion from disturbed areas. Measures for the control of pollutants during construction include:

- Use of existing access points to minimize dust and tracking materials onto Public Streets,
- Designated Parking, Storage, and Service Areas protected by silt fence and oil absorbents and sloped to control drainage,
- Minimize diesel storage,
- Stockpile spill cleanup materials,
- Regular vehicle inspection for leaks.
- Fuel off-channel with a secondary containment system for spills,
- Use quick connects whenever possible,
- Fueling by authorized personnel only, and
- Spill cleanup materials readily available.

The SWPPP shall include a Fugitive Dust Control Plan (FDCP) that will include extensive measures to control and manage soil erosion. The FDCP will provide for management of open soils that will contribute to management of runoff.

Consistent with the SWPPP and the Agency's current construction management practices, the Agency or its agent will perform routine inspections of the construction area to verify that the BMPs specified in the SWPPP are properly implemented and maintained. The Agency will notify its contractors immediately if there is a noncompliance issue and will require compliance.

HWQ-3: Spill Prevention Plan - Consistent with Agency's existing practices, the Agency will require from its construction contractors the preparation and implementation of a Spill Prevention Control and Countermeasures Plan (SPCCP) to minimize the potential for, and effects from, spills of hazardous, toxic, or petroleum substances during construction activities and operations. The plan and methods shall be in conformance with all State and Federal regulations. The Agency shall provide for routine inspection of the construction and operations areas to verify that the measures specified in the SPCCP are properly implemented and maintained and further ensure that contractors are notified immediately if there is a noncompliance issue and will require compliance.

HWQ-4: Protection of Off Site Wells. To address potential impacts to groundwater and adjacent well owners, the Agency will develop a monitoring program to monitor changes in water levels and well production in the area affected by groundwater recharge operations. The program will specify that:

- Extractions of groundwater shall not exceed 90% of the amount of water recharged,
- Water quality in recovered water and in groundwater flowing away from the Project will be monitored to ensure that water quality remains appropriate for designated beneficial uses,

- During recharge operations, water levels will be monitored and recharge operations will be suspended in the event that offsite water levels rise to within 75 feet of the ground surface, and
- During recovery operations, water levels in offsite wells will be monitored and operations will be adjusted if offsite wells are found to be adversely affected by project operations,

HWQ-5: Management of Herbicides and Pesticides - The Agency will comply with all regulations of the California Department of Pesticide Regulation regarding the use of herbicides and pesticides in areas designated for groundwater recharge.

NOISE

NOISE-1: Construction Noise Monitoring and Minimization Measures – The Agency and its construction contractors will monitor noise levels for construction activities near and along 280th Street West corresponding to the eastern boundary of the proposed Project area which includes potential noise receptors (residential homes). In the event that noise levels exceed the County of Los Angeles designated thresholds, the construction contractor will implement noise reduction measures to include:

- Providing construction equipment with sound control devices.
- With the exception of well drilling operations, restrict construction activities to day time hours.
- In the event that construction activities occur close to sensitive noise receptors, implementing appropriate additional noise mitigation measures, including but not limited to:
    - Changing the location of stationary construction equipment,
    - Shutting off idling equipment,
    - Rescheduling construction activity
    - Notifying adjacent residents in advance of construction work, and
    - Installing acoustic barriers around stationary construction noise sources.

NOISE-2: Operation Noise Minimization Measures – The Agency proposes to construct approximately 7 groundwater wells in the vicinity of 280th St. West which have the potential to increase the ambient noise level for the nearby residential homes on the east side of 280th St. West during groundwater recovery operations. The Agency proposes to equip these wells with insulated well enclosures that will reduce the operational noise level in the area to less than significant.

TRIBAL CULTURAL RESOURCES

TCR-1: Inadvertent Finds –

1. If human remains or funerary objects are encountered during any activities associated with the project, work in the immediate vicinity (within a 100-foot buffer of the find) shall cease and the County Coroner shall be contacted pursuant to State Health and Safety Code §7050.5 and that code enforced for the duration of the project.

2. In the event that Native American cultural resources are discovered during project activities, all work in the immediate vicinity of the find (within a 60-foot buffer) shall cease and a qualified archaeologist meeting Secretary of Interior (SOI) standards shall be hired to

assess the find. Work on the other portions of the project outside of the buffered area may continue during this assessment period. Additionally, San Manuel Band of Mission Indians will be contacted if any such find occurs and be provided information and permitted/invited to perform a site visit when the archaeologist makes his/her assessment, so as to provide Tribal input.

3. If significant Native American historical resources, as defined by CEQA (as amended, 2015), are discovered and avoidance cannot be ensured, an SOI-qualified archaeologist shall be retained to develop an cultural resources Treatment Plan, as well as a Discovery and Monitoring Plan, the drafts of which shall be provided to San Manuel Band of Mission Indians for review and comment.

    a. All in-field investigations, assessments, and/or data recovery enacted pursuant to the finalized Treatment Plan shall be monitored by a San Manuel Band of Mission Indians Tribal Participant(s).
    b. The Lead Agency and/or applicant shall, in good faith, consult with San Manuel Band of Mission Indians on the disposition and treatment of any artifacts or other cultural materials encountered during the project.

UTILITIES AND SERVICE SYSTEMS

UTIL-1: Electrical Service Upgrade Minimization Measures – In the event that the existing electrical grid system needs to be expanded to meet the proposed project demands, the Agency will require that the Electric Company comply with all mitigation measures identified in this Initial Study during the construction of the expansion.

Appendix D
Cultural Resources Evaluation

CRM TECH
1016 E. Cooley Drive, Suite A/B
Colton, CA 92324

September 4, 2021

Compass Consulting Enterprises, Inc.
PO Box 2627
Avalon, CA 90704
Julie Gilbert, Principal

RE: Report of Review of Project Design Changes Potential to Impact Cultural Resources
High Desert Water Bank Project
Antelope Valley – East Kern Water Agency
Northwestern Los Angeles County

CRM Tech is pleased to present this analysis of the revised site design for the High Desert Water Bank (HDWB) Project and its potential impact on cultural resources.

BACKGROUND

An Archaeological Phase 1 Cultural Resource Assessment was completed for the project, as it was designed at that time, in 2017 (AECOM 2017). During their cultural resource investigation, AECOM found that there are two isolates and the four sites within the project area. AECOM, however, further determined that these cultural resources are not eligible for listing in the California Register of Historical Resources and that they do not meet CEQA criteria for uniqueness (AECOM 2017:38).

Based on the results of all research procedures for the Phase 1 archaeological assessment for the project area, AECOM determined that there is a "low-moderate" potential that archaeological resources will be encountered during earth-disturbing activities for the project, but that such a possibility still exists (AECOM 2017:41). Based on this consideration, AECOM recommended that a monitoring mitigation plan that included part-time archaeological and Native American monitoring be developed and implemented for the project (AECOM 2017:41-42).

Based on, and in agreement with, the information, conclusions, and recommendations of the 2017 Phase 1 cultural resource assessment, CRM TECH developed the recommended monitoring mitigation plan for the project, as it was designed at the time (Hogan 2020). Because none of the known, recorded sites within the project area are considered "significant" cultural resources and because the project area appears to have a "low-moderate" potential that archaeological resources will be encountered during earth-disturbing activities for the project, the Cultural Resources Monitoring and Mitigation Plan recommends that the monitoring program begins with part-time/"spot-check" monitoring during earth-disturbing construction activities for the project. These periodic "spot-checks" could be increased or decreased in frequency depending on the rate and type of soil disturbance, the types of soils being disturbed, and what types of cultural resources are being impacted (Hogan 2020:5).

PROJECT UNDERSTANDING

In 2021, the design of the HDWB project was revised. As a result of the new, current design plans include different areas of excavation for recharge basins than previously proposed, there are changes in the number and locations of the recovery pipelines and recovery wells, and the linear feet of underground pipelines has been increased.

METHODS

To determine if the revised project plans increased or altered the project's potential impact on significant cultural resources, CRM TECH reviewed the revised design plans, the Phase I cultural resource assessment report, and the records of the previously recorded resources, including the locations of all potential historical sites, isolates, and potential Native American sacred sites. CRM TECH also reviewed the Cultural Resources and Tribal Cultural Resources sections of the Initial Study, especially the Mitigation Measures section, to determine if additional mitigation was necessary as a result of the design changes. No field work was deemed necessary.

CONCLUSION

The revised design for the HDWB project does not change the cultural sensitivity of the project area. The cultural resources known to be present within the project area are not "significant" cultural resources. As such, impacts to them are not considered significant impacts to the environment.

Based on these considerations, the changes in the project design do not require any changes to the Mitigation Measures set forth in the original Initial Study sections regarding Cultural and Tribal Cultural Resources or the Cultural Resources Monitoring and Mitigation Plan that was developed for the project in 2020 (Hogan 2020). As before, an initial monitoring program consisting of "spot-checking" the earth-disturbing activities should be implemented for the new design. These periodic "spot-checks" could be increased or decreased in frequency depending on the rate and type of soil disturbance, the types of soils being disturbed, and what types of cultural resources are being impacted. If and when cultural resources are encountered, the archaeologist will halt and divert work in the immediate area and initiate procedures so that the resource can be protected, preserved, and evaluated, as described in the existing Cultural Resources Monitoring and Mitigation Plan.

Do not hesitate to contact our office if you have any questions or would like additional information.

Cordially,

Michael Hogan, Ph.D.
Principal
CRM TECH

References Cited:

AECOM
2017 Archaeological Phase I for the High Desert Water Bank Project, Los Angeles County, California. Report provided by the Client.

Hogan, Michael
2020 Cultural Resources Monitoring and Mitigation Plan for the High Desert Water Bank Project, Los Angeles County, California. On file, CRM TECH.

Appendix E
Drainage Evaluation

Initial Drainage Evaluation for AVEK-High Desert Water Bank

Final Report

March 1, 2021

Prepared under the supervision of Joseph Long, Professional Civil Engineer in the State of California.

Prepared by:

David T. Phelps, PE
Todd Ramsey, EIT
Elizabeth Simon, EIT

Revision	Description	Author		Quality Check		Independent Review	
0.04	Draft	T Ramsey and E Simon	7/26/20	D. Phelps	8/5/20	Joseph Long	8/20/20
0.05	Draft	T Ramsey	2/20/21	D. Phelps	2/23/21	Joseph Long	3/01/21

INITIAL DRAINAGE EVALUATION FOR AVEK-HIGH DESERT WATER BANK

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Prepared by Todd Ramsey
(Todd Ramsey)

Reviewed by _____
(David T. Phelps)

Prepared under the supervision of _____, Professional Civil Engineer in the State of California.
(Joseph Long)

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1.0 INTRODUCTION

1.1 GENERAL

The Antelope Valley East Kern Water Agency (AVEK) is developing the High Desert Water Bank (HDWB) located in the westerly limits of Antelope Valley south of Los Angeles County/Kern County line, north of the State Water Project East Branch, east of 300th St. and west of 280th St. near Neenach, California. The proposed water bank development will occupy approximately 1,200 acres consisting of recharge basins, influent conveyance systems, recovery wells and discharge conveyance systems. Ancillary facilities include power distribution, SCADA controls and other support systems.

The project site is situated near the confluence of several discrete watersheds draining portions of the Tehachapi Mountains to the north and the San Gabriel Mountains to the south. During storm events the proposed project area becomes inundated covering significant portions of the site. Flood mitigation improvements will be required to protect the proposed water bank facilities. This document provides an analysis of the hydrologic conditions of the project area, evaluation of flood mitigation measures and recommended site improvements that control on-site flooding without worsening downstream flood conditions.

1.2 LOCATION

The HDWB project is located within Los Angeles County, California, generally 50 miles north of Los Angeles, and 25 miles west of Lancaster. The site improvements are bounded by Avenue A on the north, 280th Street on the east, the California Aqueduct on the South and 300th Street on the west. More specifically, the site is located within Sections 1, 2 and 12 of Township 8 North and Range 12 West and as shown on Figures 1 and 2.

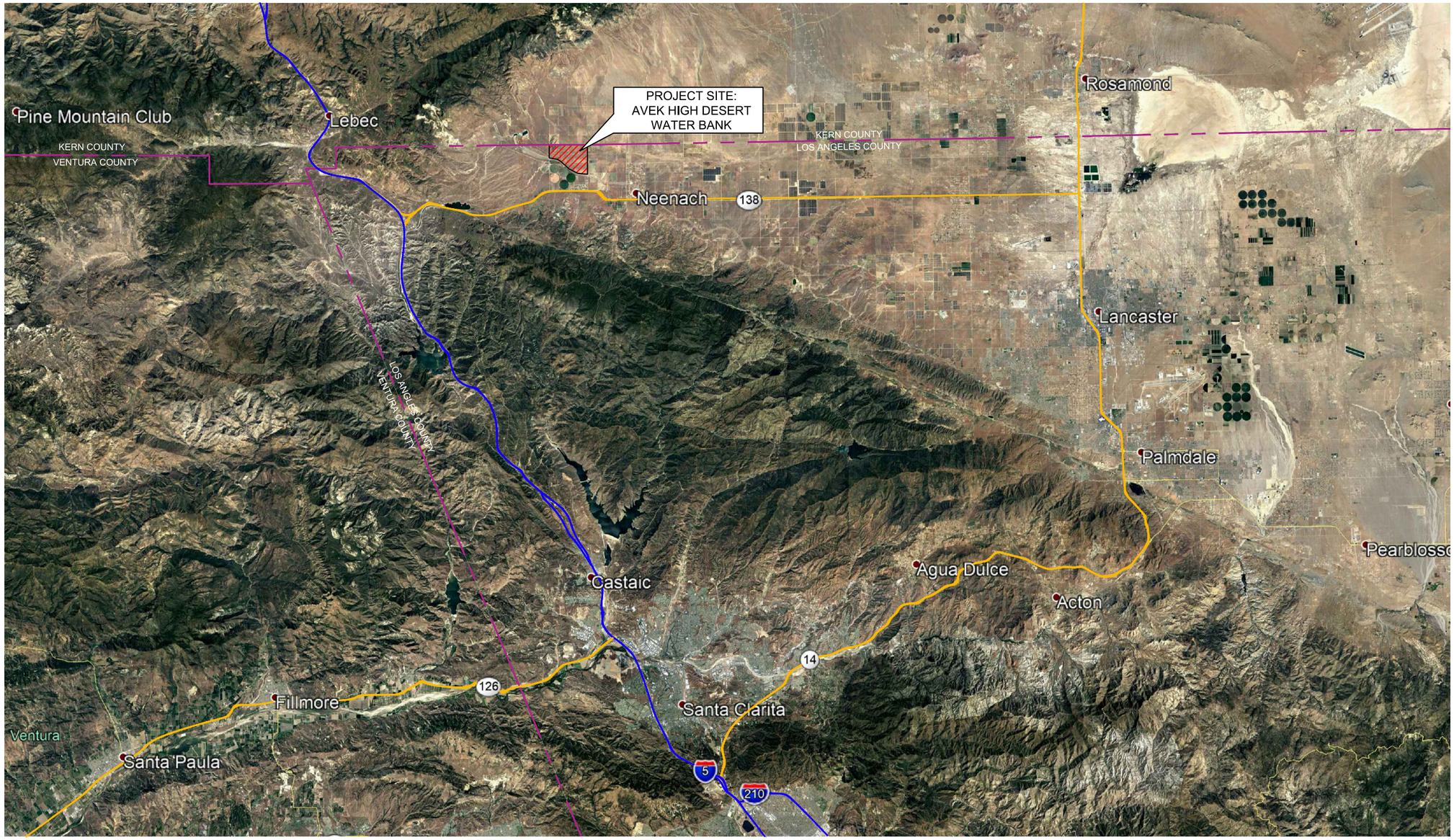
1.3 HYDROLOGIC SETTING

This site receives stormwater runoff from the Tehachapi Mountains to the north, from the San Gabriel Mountains to the south, and from the west, where these two mountain ranges come together. The offsite tributary watershed from the west consists of 42 square miles for Oso Canyon Creek which contains several tributary watersheds. The northern tributary watershed consists of 19 square miles contributing to Pescado Creek and Antelope Canyon Creek. The average offsite watershed elevation is about 3720 feet above MSL. The average existing site elevation is 2960 feet. Vegetative cover on the site area consists of lower mountain grasslands, rangeland brush and various other native vegetation.

1.4 PURPOSE AND SCOPE OF WORK

The purpose of this Technical Memorandum is to document hydrologic methods used and assumptions made to evaluate the existing drainage patterns tributary to the distributary floodway and quantify

magnitudes of flow. The scope of this TM is to document concept drainage improvements required to convey drainage through and/or around the site in support of proposed improvements.



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1–INCH = 30,000 FT

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Notes:
MAPPING SOURCE:
GOOGLE EARTH 2020

LEGEND:

- 210 — US INTERSTATE HIGHWAY
- 126 — PAVED HIGHWAY
- COUNTY BOUNDARY
- PROJECT SITE BOUNDARY
- URBAN COMMUNITY

Client/Project
AVEK - HIGH DESERT WATER BANK PROJECT

Stantec Project No. 184031288

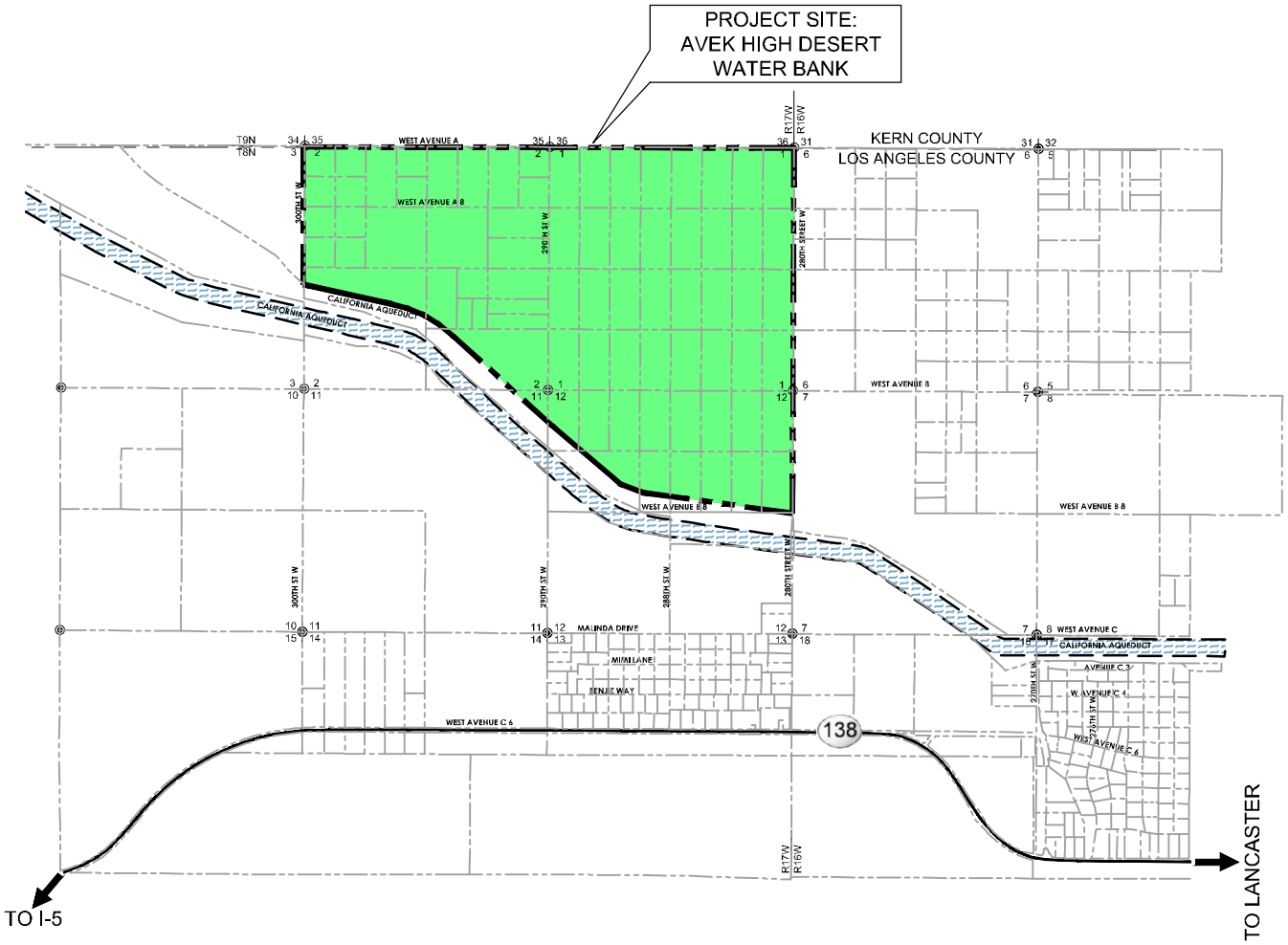
Title
LOCATION MAP

Revision 0.00

Date 2020/08/25

HOIRZ : NAD 83
VERT : NGVD 88

FIGURE 1



LEGEND:

- PROJECT SITE
- PARCEL BOUNDARY
- USGS SECTION CORNER
- CALIFORNIA AQUEDUCT
- 138 HIGHWAY 138

N

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1-INCH = 4,000 FT

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Client/Project
AVEK - HIGH DESERT WATER BANK PROJECT

Stantec Project No. 184031288

Title
VICINITY MAP

Revision 0.00

Date 2020/8/10

HOIRZ : NAD 83
VERT : NGVD 88

FIGURE 2

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2.0 FEMA AND FLOODPLAIN DATA

There is a Federal Emergency Management Agency (FEMA) floodplain located across the HDWB site. The proposed site improvements will provide conveyance and containment of these flows through and around the site. No habitable infrastructure is planned for the HDWB project.

The FEMA Flood Insurance Rate Map (FIRM) for the project area is panel 0075 of 2350 (06037C0075F) for Los Angeles County, California and unincorporated areas. The current FIRM of record is dated 09/26/2008, portions of which are reproduced on Figure 3.

The western and northern portions of the flooded area (in blue) is designated as FEMA Flood Hazard Zone A. FEMA Zone A is defined as "Areas subject to inundation by the 1-percent-annual-chance flood event generally determined using approximate methodologies". The eastern portions of the flooded area (purple) are designated as Zone X. FEMA Zone X is defined as "Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from the 1% annual chance flood", with the "areas of 1% annual chance flood with average depths of less than 1 foot" definition being the most applicable at this location. The northern boundary of the site, Avenue A, separates Kern County from Los Angeles county.

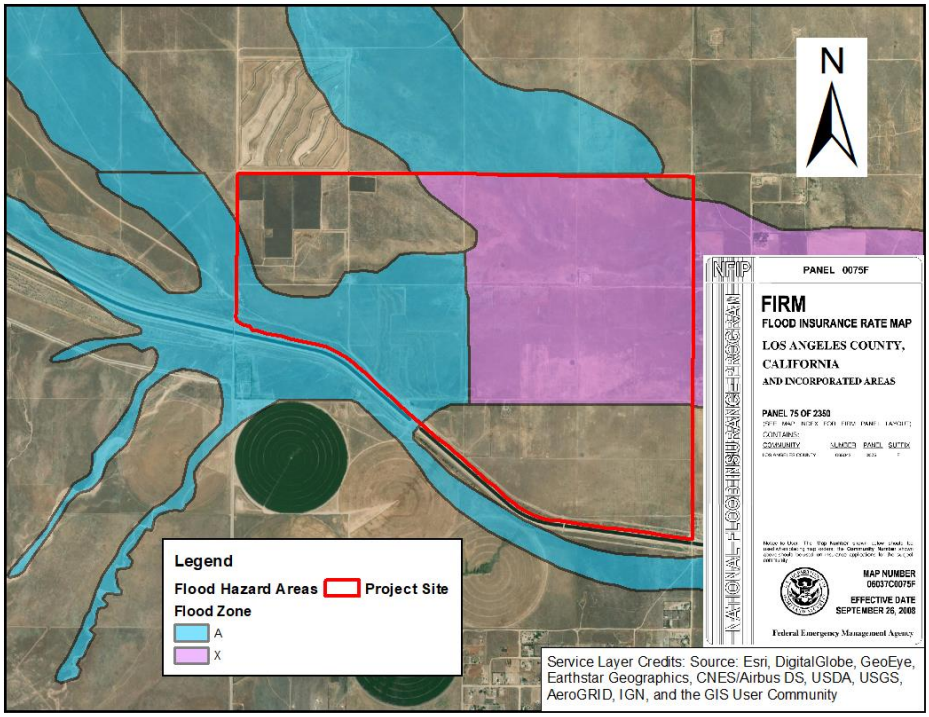


Figure 3 – FEMA Flood Insurance Rate Map

3.0 MAPPING AND SURVEY DATA

The topography used to evaluate this watershed is obtained from the National Oceanic and Atmospheric Association (NOAA) Data Access Viewer. Some of this topographic mapping consisted of LiDAR mapping obtained from https://coast.noaa.gov/dataviewer/#/ and is used to generate DEMs and contours for the basis of the AVEK HDWB watershed evaluation. To fill any mapping gaps, 30-meter raster datasets from the National Elevation Dataset are retrieved from the NRCS/USDA Geospatial Data Gateway: https://datagateway.nrcs.usda.gov/

COORDINATE SYSTEM:

NAD83/92, California State Plane Zone V, as provided by the NOAA data server.

HORIZONTAL AND VERTICAL CONTROL:

NAD 83 horizontal and NAVD 88 vertical.

4.0 DATA COLLECTION AND REVIEW

Several sources of data are used to compile information for the project area; these include the following.

United States Geological Survey (USGS)

- LiDAR survey data produced by USGS and obtained via the NOAA Data Access Viewer
    - 2016 USGS LARIAC LiDAR
    - 2018 USGS LiDAR: Southern CA Wildfires
- Stream gauge data from StreamStats website, https://streamstats.usgs.gov/ss/, as well as regression equations from *Scientific Investigations Report 2012-5113: Methods for Determining Magnitude and Frequency of Floods in California, Based on Data through Water Year 2006*.
- Quadrangle sheets via ArcGIS base map feature

Land use description, 1987 Report United States Department of Agriculture (USDA)

Soil data for regions of Antelope Valley, Angeles Valley, and Southeastern Kern County, obtained via the NRCS Web Soil Survey - https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htmNational Oceanic and Atmospheric Administration (NOAA)

- Rainfall point precipitation estimates for 2, 5, 10, 25, 50, and 100-year storm events, obtained via Atlas 14 Precipitation Frequency Data Server - https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html

National Resources Conservation Service (NRCS)

- Topographic information: 30-m digital elevation model (DEM) rasters from the National Elevation Dataset (NED) for portions of the study area, obtained via the NRCS/USDA Geospatial Data Gateway

5.0 HYDROLOGIC ANALYSIS

5.1 METHODOLOGY AND SOFTWARE SELECTION

Hydrologic analysis is completed using U.S. Army Corps of Engineers (USACE) Hydrologic Engineering Center Hydrologic Modeling System (HEC-HMS) in the upland steep-slope areas and River Analysis System (HEC-RAS) to estimate two-dimensional flow over the flatter braided network areas. ArcGIS is used for geographical calculations and mapping. USDA Technical Release 55 (TR-55) methodology is utilized to calculate time of concentration values subsequently used in the HEC-HMS model. Rainfall-on-grid is applied to the flatter areas when estimating rainfall-runoff using HEC-RAS 2D. A hydrology map is included in Appendix A.

Developed and maintained by the USACE, HEC-HMS and HEC-RAS are widely accepted models for hydrologic analysis incorporating a variety of calculation methods and routing options. HEC-HMS features a completely integrated work environment including a database, data entry utilities, computation engine, and result reporting tools. The components of HEC-HMS include a basin model, meteorological model, and control specifications. HEC-HMS software does not have constraints on watershed size or time of concentration.

HEC-RAS is only capable of one-dimensional hydraulic modeling at the time of its first release in 1995, after being converted from HEC-2 by the United States Army Corps of Engineers (USACE). In February 2016, HEC-RAS version 5.0.0 incorporated two-dimensional modeling capabilities. Instead of being limited to a river reach and cross-sections, topography datasets in the form of geotiffs can be imported and associated with the HEC-RAS geometry file. When using the geotiff datasets, a computational mesh boundary can be established along with inflow and outflow boundary condition lines set along the edge of this flow area to better model overland flow. Flat, alluvial basins, such as the lower basin surrounding the AVEK project site, are an ideal application for two-dimensional flow modeling.

Due to the nature of the project area and size of watershed, which includes portions of Los Angeles County and Kern County, rainfall runoff models assembled using HEC-HMS and HEC-RAS are recommended as the most suitable method to estimate rainfall/runoff response for this study. As mentioned above, TR-55 methodology is used in conjunction with HEC-HMS to define watershed input parameters.

Rainfall depth-area ratios from NOAA Technical Report NWS 24 (NWS-24) are considered as an additional model input parameter. However, due to the shape of the watershed, the more conservative approach of not area reducing rainfall input is selected for this project.

Rainfall-runoff hydrographs produced by the HMS model are extracted at most of the mountain basin concentration points. A two-dimensional flow model domain is established in HEC-RAS, bounded by the mountain subbasins modeled in HMS, and encapsulating the lower, flatter basin containing the project site. Figure 4 illustrates the portion of the watershed that is modeled in HEC-HMS and the portion

modeled using HEC-RAS. The HEC-RAS Model domain overlaps the subbasins at some locations, generally for the purpose of establishing a better placement for the inflow boundary condition lines.

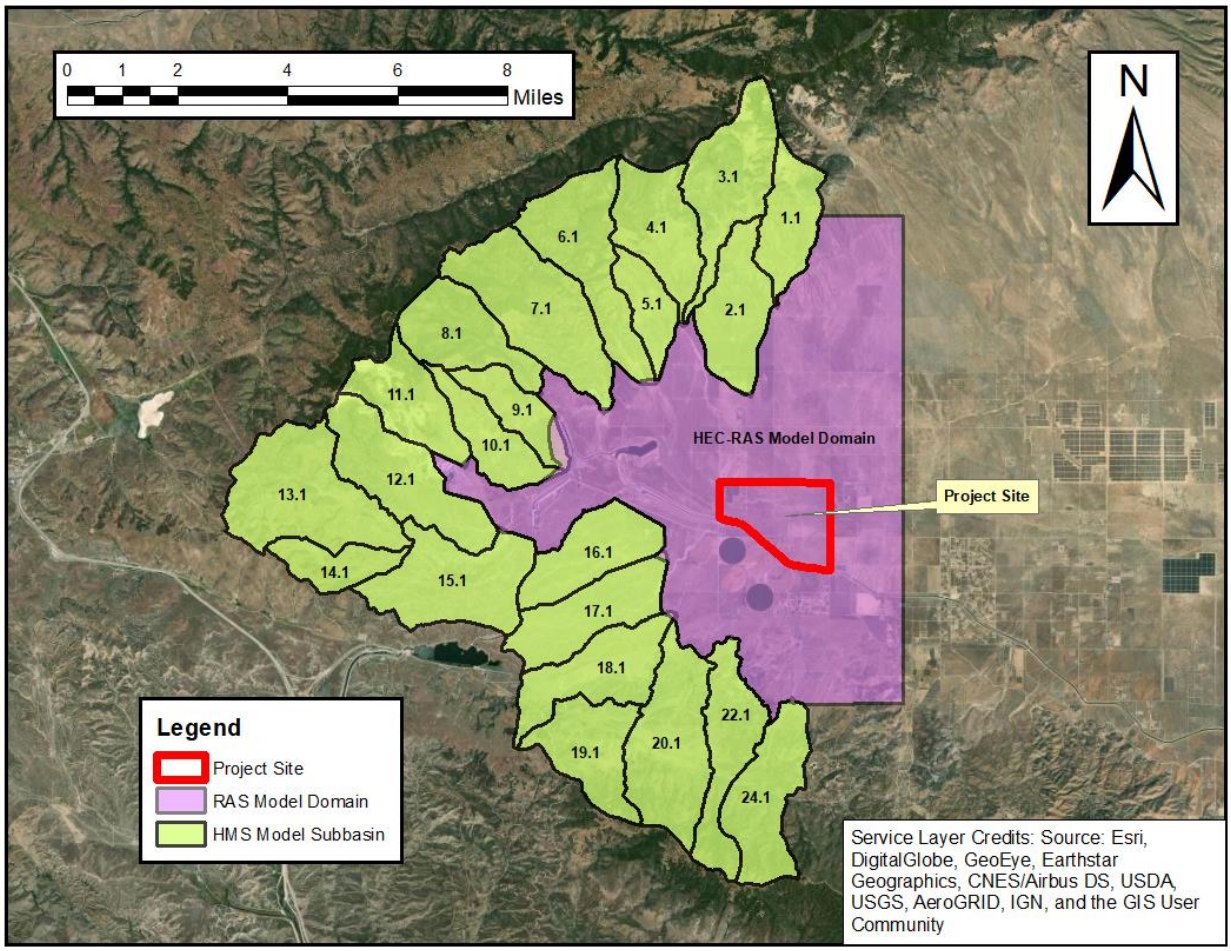


Figure 4 – Hydrologic Model Setup

5.2 WATERSHED PARAMETER ESTIMATION

Watershed parameters assigned to the hydrologic model are ascertained from the data sources described above and estimated as indicated below.

5.2.1 Watershed Delineation

The overall watershed is delineated using digital elevation maps (DEMs) assembled from LiDAR data obtained from the NOAA Data Access Viewer. (https://coast.noaa.gov/dataviewer/#/). The DEMs are assembled into the form of a raster image with a three-foot resolution.

The drainage area of the contiguous watershed is approximately 93 square miles. About half of that area consists of steep mountain subbasins with incised drainage courses. The lower half consists of

distributary alluvial braids that may cross drainage boundaries depending on the rainfall event. As described above and to better estimate the rainfall runoff response of the lower alluvial areas, HEC-RAS 2D is utilized to model the rainfall runoff over these areas, combined with the flows routed from the upper subbasins over the terrain. See Figure 5 - Subbasin Map for a depiction of the subbasins. All watershed area boundaries and calculations are performed by GIS software and verified visually against the contours.

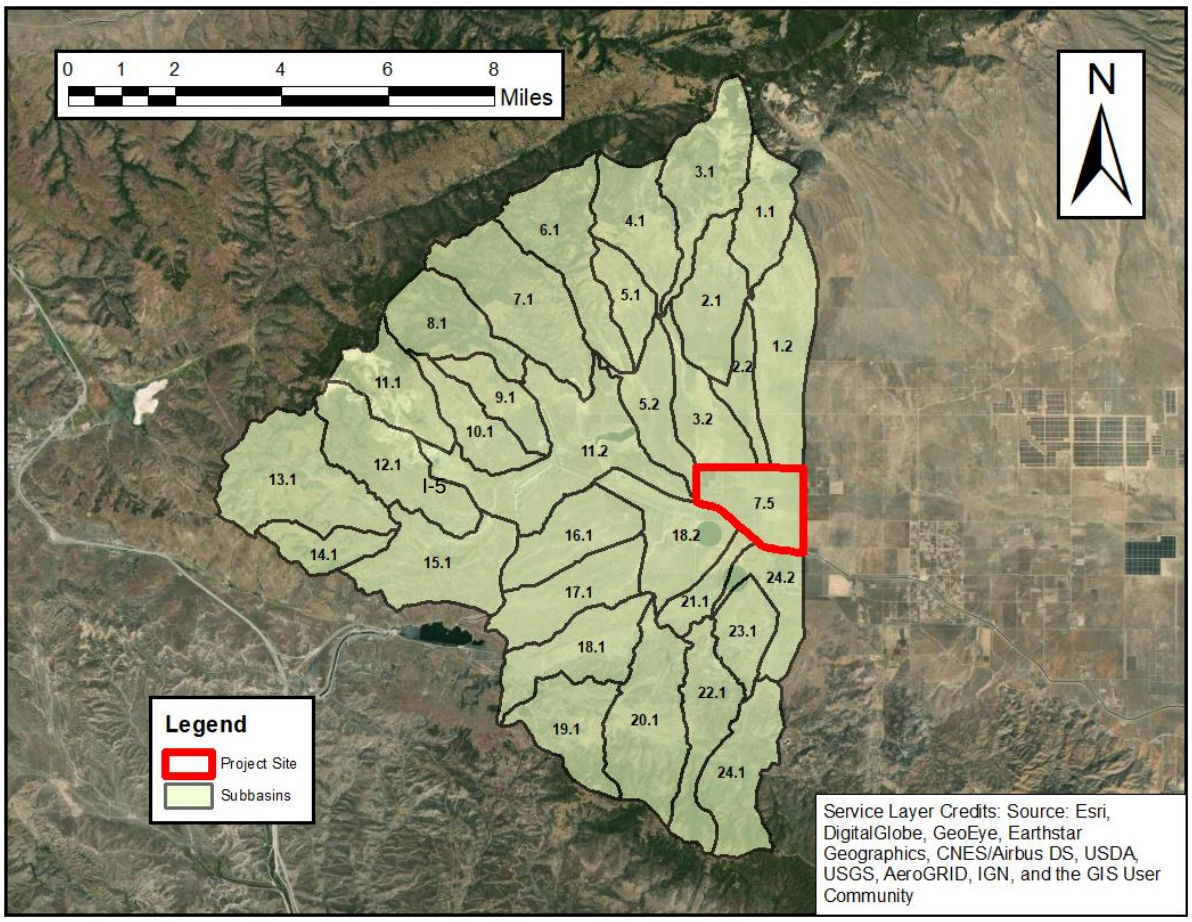


Figure 5 - Subbasin Map

5.2.2 Statistical Parameters

The statistical data available for the watershed consist of point precipitation values as published by the National Oceanic and Atmospheric Association (NOAA) and the Natural Resource Conservation Service. There are no known rain gauges within this watershed. Furthermore, no historic rainfall data is available in this project area.

5.2.2.1 Rainfall Depth and Distribution

The precipitation depth for a given storm can vary widely from one area to another due to the unique topography and climate of the project watershed, specifically the mountain and high desert climates. The decimal-degree 'x' and 'y' coordinates of the centroid of the watershed is computed in GIS and entered on NOAA's Atlas 14 website. The resulting point precipitation-frequency data is then downloaded to obtain the point depths of rainfall over the watershed for the various storm events. This precipitation data is included in Appendix C for review.

A NRCS (formerly SCS) Type 1 temporal distribution is assumed for the 24-hour storm event. In HEC-HMS, the meteorological models for the various storm events (24-hour: 2-year, 5-year, 10-year, 25-year, 50-year and 100-year storms) are set to use a "Hypothetical Storm", with the "SCS Type I" storm being selected. To account for the rainfall in HEC-RAS – which does not compute infiltration - an SCS Type I excess-runoff hyetograph is produced using the weighted curve number of the full 2D domain along with the point depths of the respective storm events. These hyetographs are then coded as "Precipitation" boundary conditions ("rain-on-grid") in the Unsteady Flow editor window for each storm event. The worksheet used to produce these hyetographs are included in Appendix E.4.

5.2.3 Physical Parameters

The physical parameters defining the hydrologic response of the watershed to rainfall are listed below. Worksheets are developed to calculate these physical parameters according to the methods provided in the CALTRANS Hydrology Manual and the NRCS Technical Release 55 (TR-55). The summary tables for the curve numbers and times-to-concentration are provided in Appendix B, and the worksheets for the curve numbers and times-to-concentration are included in Appendices E.1 and E.2, respectively.

5.2.3.1 Soils Data, Vegetative Cover and Curve Number

The curve number is a numerical value used to determine the expected runoff from the area based on soil type and surface cover. These values are developed using the USDA NRCS Curve Number Method as outlined in TR-55. The curve numbers are assigned based on land use and the Hydrologic Soil Group (HSG) of the underlying soil within the watershed. Soils are classified as having a HSG of "A," "B," "C," or "D," which corresponds to the particular soil's ability to store runoff. Soils of HSG 'A' have the lowest runoff potential, while soils of HSG 'D' have the highest runoff potential.

The project watershed is primarily undeveloped land with significant portions of mountainous and high desert subregions. Research of the area including USGS reports and virtual site walks indicate the area may be characterized as semiarid rangeland with primary cover of desert shrub. The hydrologic condition of the area is characterized as poor, corresponding to less than 30% of the ground being covered by vegetation. These classifications fall in line with the definitions established in TR-55.

Soils information is obtained from the NRCS/USDA Web Soil Survey database. The area-of-interest polygon drawn on the website matched the AVEK watershed extents. The soils shapefile and associated report for this area is downloaded, and the hydrologic soil groups are assigned to each unique soil-type polygon per the report. Figure 6 details the HSG distribution within the watershed, with the primary soil

HSG shown over each area. Some soil mixtures are comprised of a soil type of one HSG and another soil type of a second HSG. In this case, the percentages are normalized to take out the effects of any minor soil-mixture components, and the curve number is calculated taking into account this compound HSG.

It can be observed by inspection of Figure 6 that there is a heavy presence of 'B' and 'C' HSG soils, indicative of moderate runoff potential.

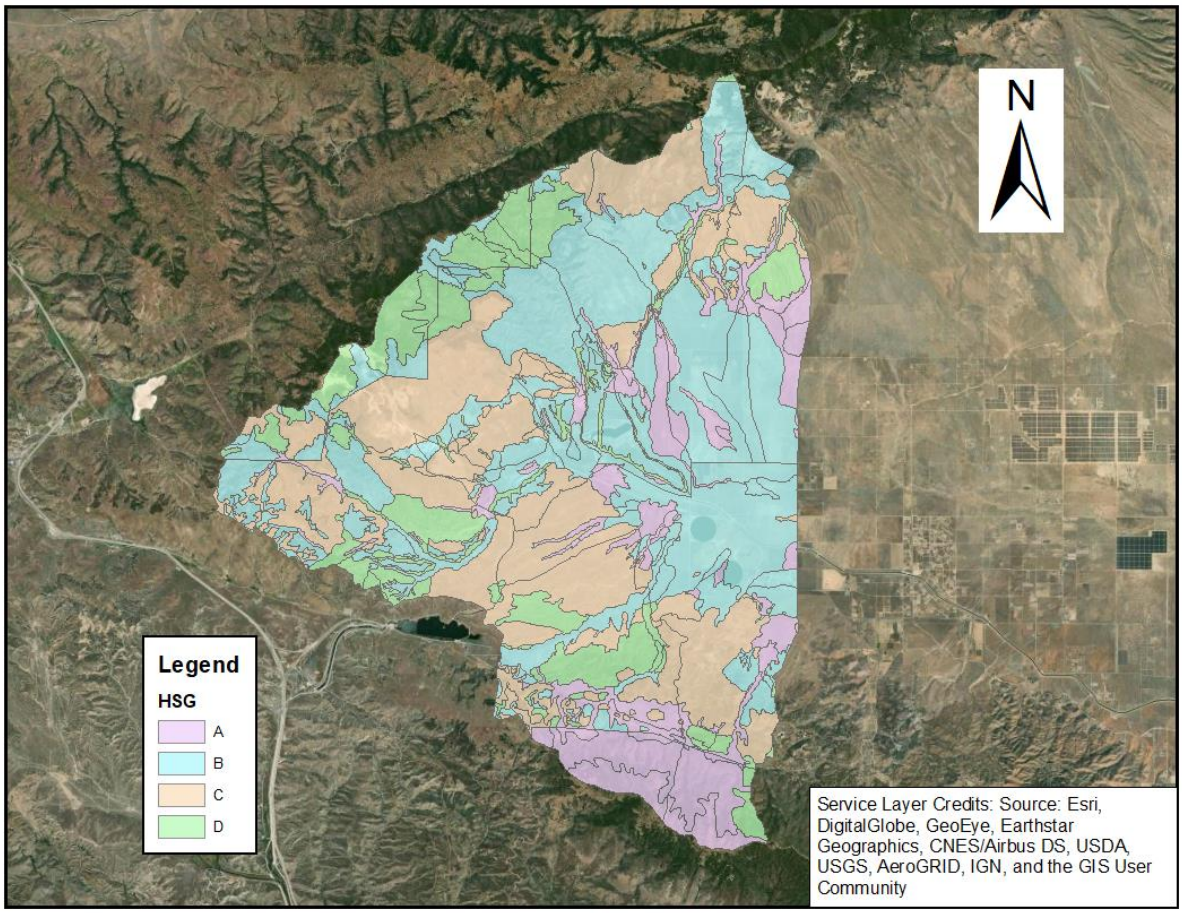


Figure 6 – Soils

Utilizing GIS, the "Intersect" tool is run to combine the soils and subbasins shapefile, and the data from this shapefile exported to Excel. The area-weighted curve numbers are calculated for each subbasin, as well as the area encompassed by the HEC-RAS 2D model domain, for use with the rain-on-grid hyetograph. The curve-number calculation spreadsheet is included in Appendix E.1. The HEC-HMS model subbasin elements had a curve number assigned based on these calculations.

5.2.4 Unit Hydrograph Time of Concentration

Time of concentration (Tc) represents the time required for a drop of water that falls on the most hydrologically remote portion of a watershed to reach the watershed outlet or concentration point located

within the watershed. The NRCS TR-55 method is used to develop the Tc's implemented in the modeling efforts of the project area. This method estimates runoff through a watershed using the concepts of sheet flow, shallow concentrated flow, and open channel flow. Sheet flow is defined as flow over plane surfaces by TR-55. It is usually present near the headwaters of a stream and generally considered applicable for only the first few hundred feet of a stream. Sheet flow lengths are generally limited to 300-ft, per the National Engineering Handbook. Shallow concentrated flow occurs where flow is shallow and unconfined by boundaries of a channel. According to TR-55, open channels flow occurs when channels are identifiable in aerial photographs or indicated on USGS quadrangle sheets.

Due to the size of the watershed and subareas when divided, the methods of calculating Tc by evaluating the time of concentration in the sheet flow, shallow concentrated flow and channel flow regimes are used in combination. Intercept and roughness coefficients are estimated based on research of the area's groundcover. They are incorporated in the Tc calculation via the TR-55 equations and Manning's equation as parameters for the travel times of the three flow regimes. The TR-55 equations are used to calculate the travel time in sheet flow and shallow concentrated flow, while Manning's equation is used to evaluate the travel time in channel flow.

The Tc calculation spreadsheet is included in Appendix E.2. Figure 7 details the flow paths for which the time of concentration is calculated.

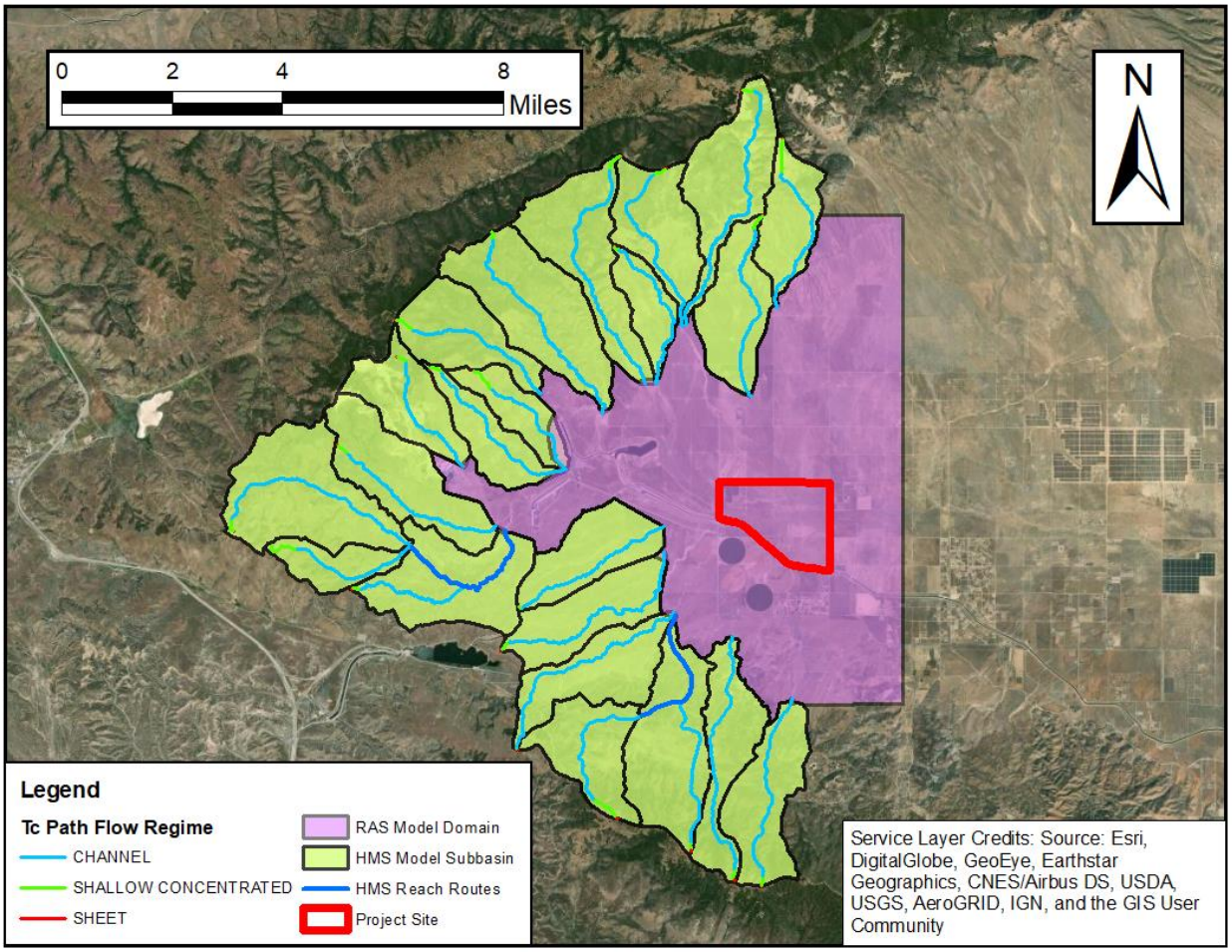


Figure 7 – HEC-HMS Flow Paths

5.2.5 Routing Reaches

Routing reaches are used to translate an upstream hydrograph through the downstream sub-basin to the next hydrologically connected watershed. The reach route lag time entered in HEC-HMS is equal to the total travel time, computed using Manning's equation. The length of the reach route is then divided by the velocity at normal depth to determine the travel time. Position and length of the modeled reaches are determined by analyzing topographic information. All length calculations are performed by GIS software. The calculations for the reach route lag times are included in Appendix E.3.

5.3 HYDROLOGIC MODELING METHOD

After verifying the input parameters in the HEC-HMS basin model, meteorologic models are assembled for 2, 5, 10, 25, 50, and 100-year storm events. In each meteorological model, the SCS Type I storm distribution is selected, and the associated frequency-storm's point depth entered per the NOAA data obtained from Atlas 14. Figure 8 displays the layout of the HMS basin model.

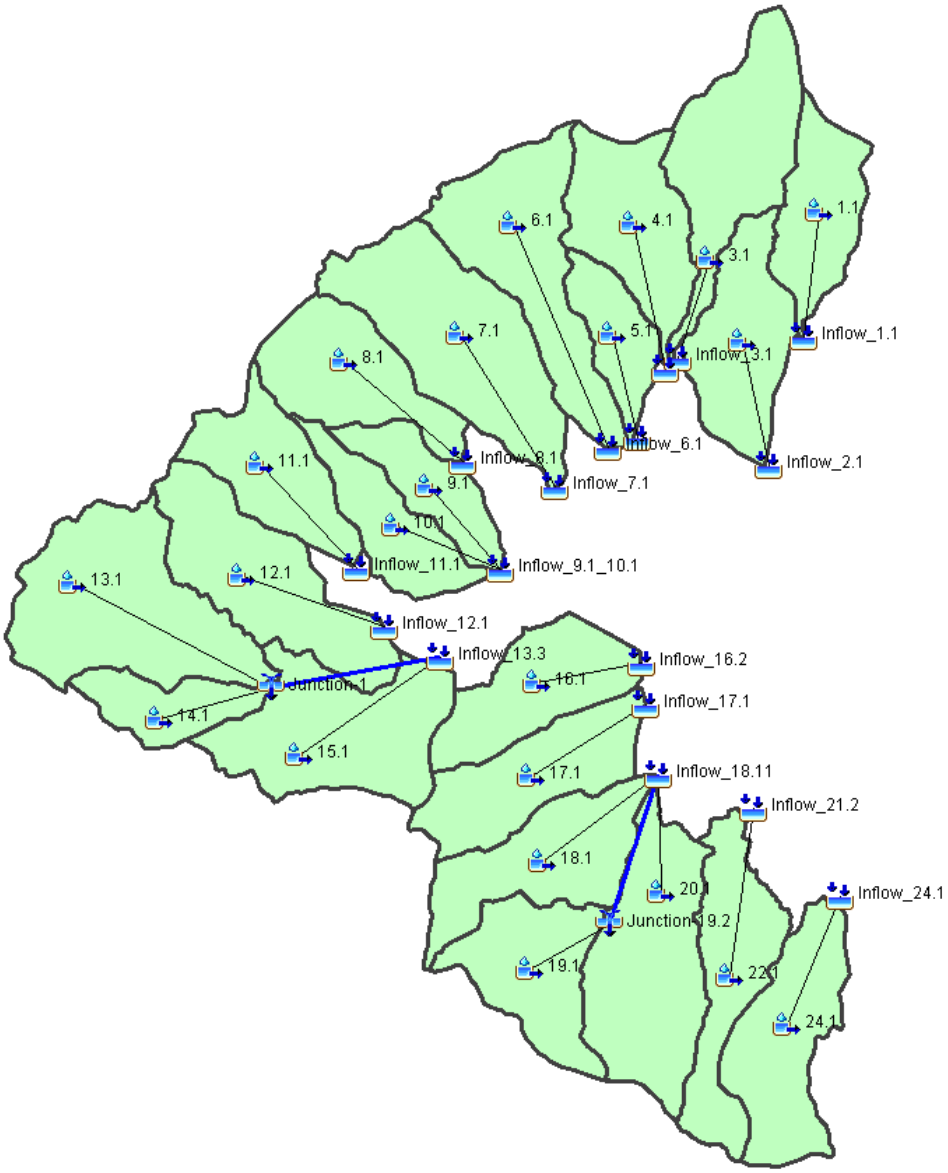


Figure 8 – HEC-HMS Basin Model Layout

The resulting hydrographs at each of the HMS outflow nodes are referred to as 2D "Inflow" nodes. The 2D "inflow" nodes generated in HMS are saved to a series of spreadsheets. Appendix E.5 contains this dataset. These 2D "inflow" hydrographs are then entered into the HEC-RAS Unsteady Flow files, one for each storm. Figure 9 shows the geometry setup of the two-dimensional RAS model.

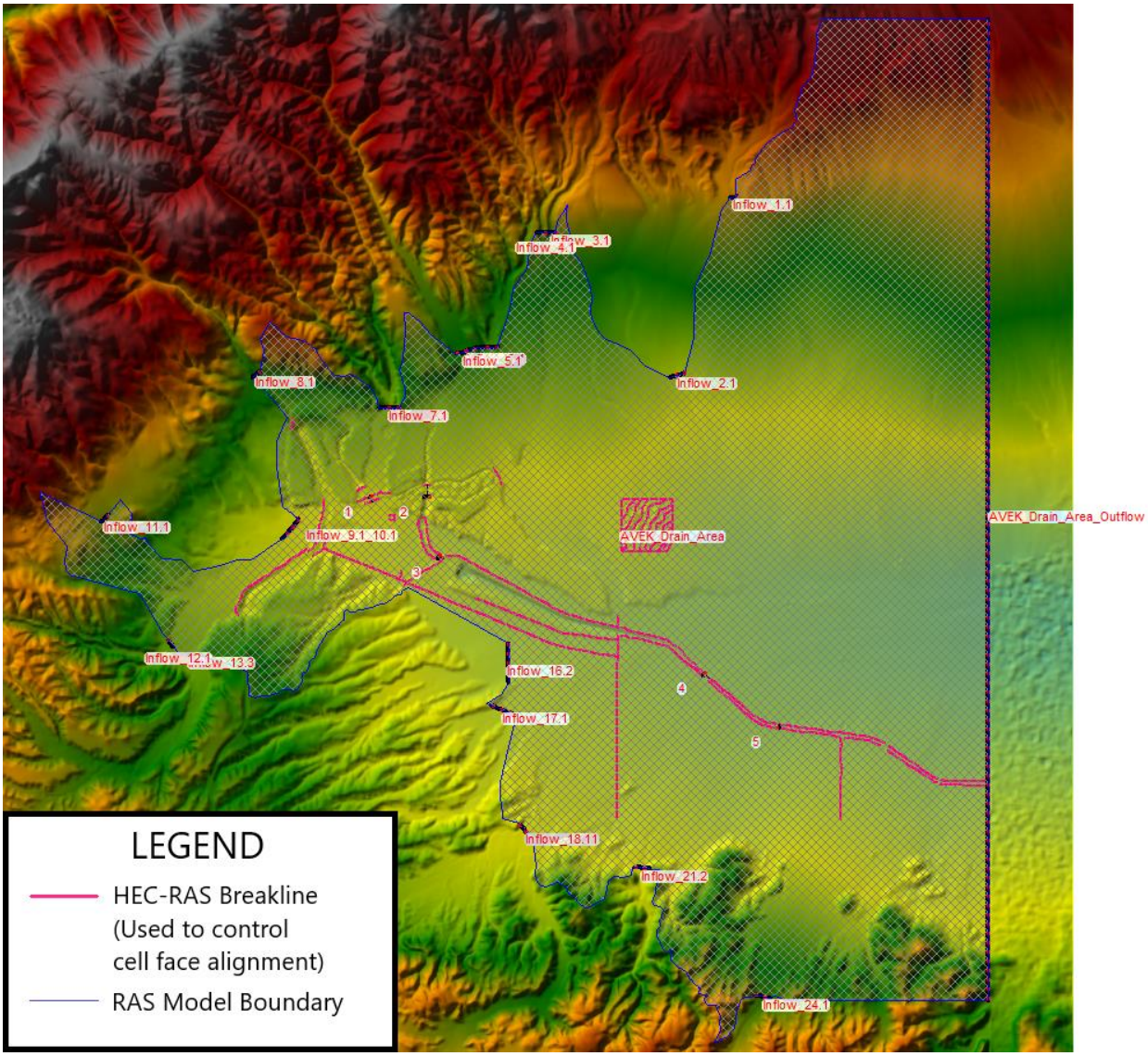


Figure 9 – HEC-RAS Model Geometry Layout

The boundary condition lines along the northern, western and southern boundaries of the RAS domain match up with the HMS outflow (AKA 2D "Inflow") nodes shown on Figure 8. Each one of these lines corresponds to a hydrograph, discussed above, for which the corresponding HMS outflow hydrograph is transferred into HEC-RAS 2D.

As discussed in 5.2.2.1, the precipitation hyetographs for the HEC-RAS rain-on-grid are generated via a spreadsheet (included in Appendix E.4) using the weighted curve number over the 2D domain and the SCS Type I storm distribution.

6.0 HYDROLOGIC RESULTS

6.1 PEAK FLOW RESULTS

Following the computation of the basin modeling for each storm event scenario in HEC-RAS, the results are compiled and tabulated for verification, comparison and reporting measures. The peak flow results are measured in HEC-RAS using RASMapper, a program embedded in HEC-RAS for viewing the results. In RASMapper, profile lines are drawn across the sections-of-interest, and the hydrographs exported for the peak flow and volume accumulations to be calculated via spreadsheet. All of the results for each of the storm event scenarios modeled are located in Appendix D for reference and review. Appendix A (the hydrology map) includes the locations of the concentration points below, as do Figures 13, 14 and 15.

A brief summary of the Hydrologic results produced from HEC-RAS 2D follows in Table 1.

Table 1 Summary of Peak Discharge for each storm event (EXIST / PROP), in cfs

Concentration Point	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
1	3,820 / NC	7,310 / NC	10,540 / NC	14,790 / NC	17,670 / NC	20,110 / NC
2	1,310 / NC	2,770 / NC	4,070 / NC	5,940 / NC	7,370 / NC	8,870 / NC
3	5,130 / NC	10,100 / 10,070	14,630 / 14,570	20,780 / 20,700	25,080 / 24,990	28,910 / 28,810
4	40 / NC	100 / NC	190 / NC	350 / NC	490 / NC	630 / NC
5	0 / 40	0 / 100	0 / 180	0 / 340	0 / 490	10 / 630
6	40 / NC	100 / NC	190 / 180	360 / 340	500 / 470	640 / 620
7	5 / NC	10 / NC	20 / NC	30 / NC	40 / NC	60 / NC
8	650 / NC	1,510 / NC	2,310 / 2,330	3,880 / 3,920	5,210 / 5,250	6,430 / 6,490
9	1,460 / 640	3,170 / 1,490	4,690 / 2,330	6,960 / 3,890	8,590 / 5,250	10,010 / 6,480
10	4,150 / 5,070	8,170 / 10,020	12,180 / 14,560	17,620 / 20,810	21,490 / 25,220	25,000 / 29,170
9 + 10 (total site runoff)	5,610 / 5,710	11,340 / 11,510	16,870 / 16,890	24,580 / 24,700	30,080 / 30,470	35,010 / 35,650

Note: NC = No Change or same as existing conditions

The total rainfall-runoff volume estimated at concentration points 9 and 10 (the major outlet points of the site) for the 100-year storm event is 15,240 acre-feet for existing conditions. This total rainfall-runoff volume is slightly less under proposed conditions – 15,078 acre-feet – due to some storage effects of the site improvements.

Figure 10 shows the maximum depth distribution of existing condition flooding over the project site for the 100-year storm. Figure 11 shows the maximum velocity distribution for the same event.

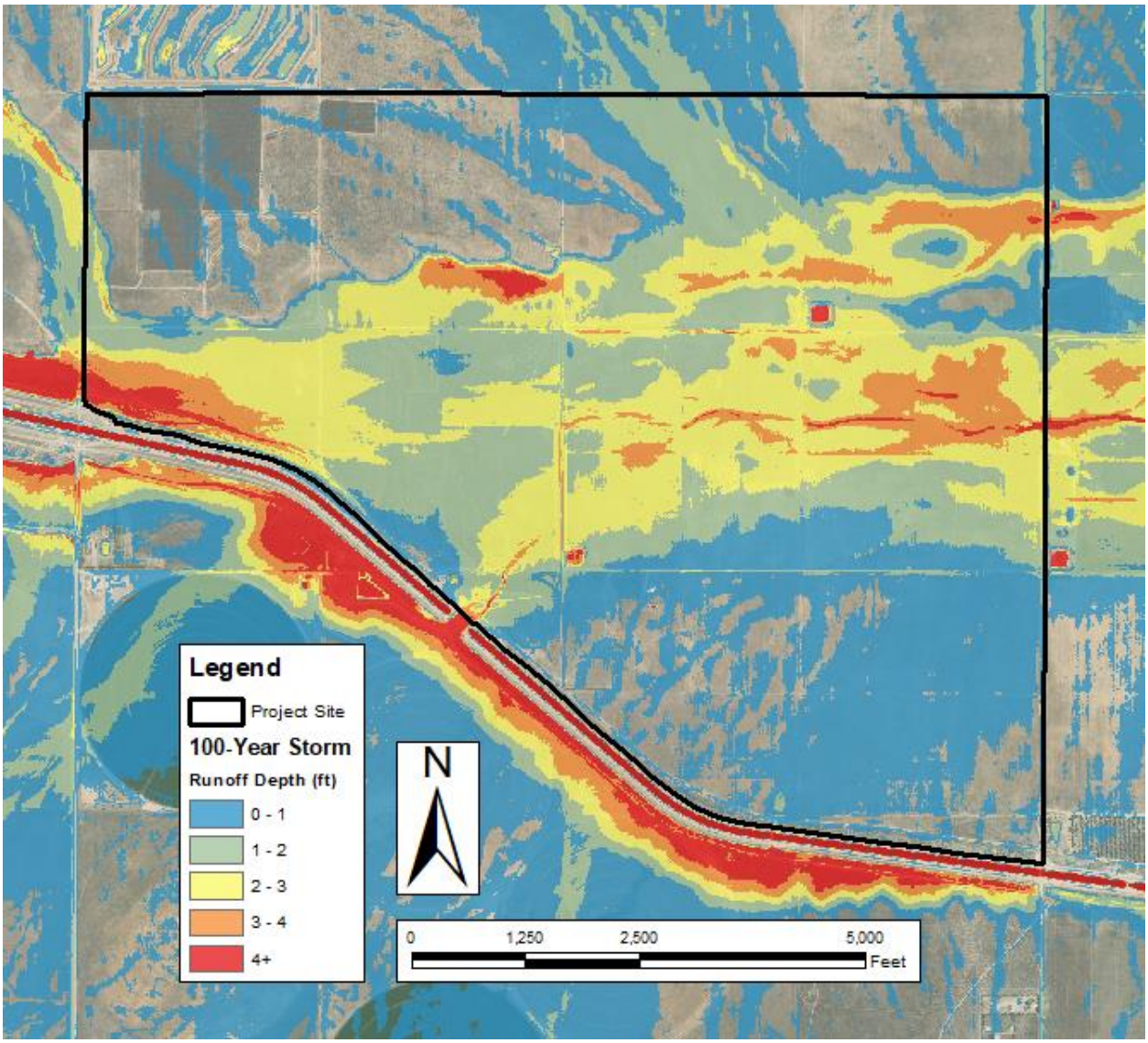


Figure 10 – Project Site 100-Year Existing Conditions Flooding – Maximum Depth

As the flow from the north, west and south directions enters the site, two-dimensional distributary runoff patterns occur. In order to model the impact of any proposed drainage improvements most effectively, it is recommended that HEC-RAS be used along with its two-dimensional modeling capabilities to model the proposed improvements to the site.

The Manning's n roughness coefficient of 0.045 is applied to majority of two-dimensional flow domain areas and is consistent with the firm soil and light amount of vegetation observed in the floodplain. The selected value follows recommendations published in the USGS Water-Supply Paper 2339 (1989).

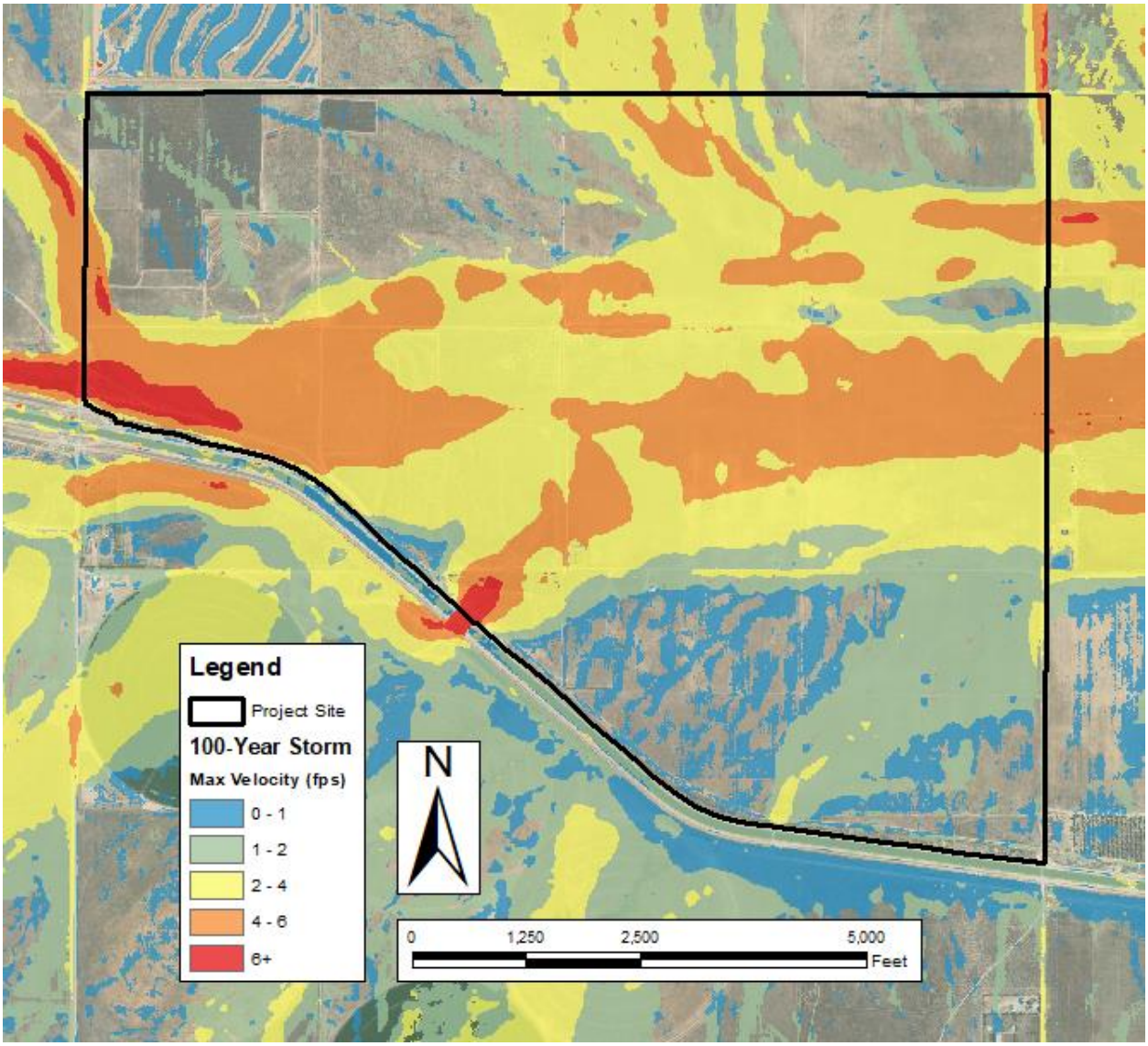


Figure 11 – Project Site 100-Year Existing Conditions Flooding – Maximum Velocity

The depths and velocities shown are the instantaneous maximum depth and velocities at each location. This means that the maximum value at one location might occur at a different time than the time of peak flow velocity at another location. The same is true for Figures 14 and 15, which detail the same information with proposed improvements in-place.

7.0 MODEL VERIFICATION

Although calibration of the HEC-HMS and HEC-RAS 2D modeling are not possible due to a lack of rainfall and/or watershed gauge data, verification of the modeling is possible. Two independent methods of verification are available for this site. The first consists of comparing results against known USGS stream gauges. The second independent verification method is comparison of results against USGS regression analysis using regional flood-frequency equations for rural un-gauged streams in California as indicated in *Scientific Investigations Report 2012-5113: Methods for Determining Magnitude and Frequency of Floods in California, Based on Data through Water Year 2006*.

7.1 VERIFICATION OF SUB-AREAS

The HDWB project area lies within USGS Desert Region 6. There are only two USGS stream gauges located within USGS Desert Region 6. These gauges are about 25 miles away from the HDWB site. The USGS stream gauges are 10264530 Pine Creek (https://nwis.waterdata.usgs.gov/nwis/peak?site_no=10264530&agency_cd=USGS&format=html) near Palmdale, CA and 10264605 Joshua Creek https://nwis.waterdata.usgs.gov/nwis/peak?site_no=10264605&agency_cd=USGS&format=html near Mojave, CA. These gauges have drainage areas of 1.78 sq. mi. and 3.83 sq. mi., respectively.

The USGS Scientific Investigations Report 2012-5113 indicates the following regression equation with one percent annual exceedance probability (100-year storm event) within Region 6. According to the same report, the one percent annual exceedance probability contains an average standard error of 444.3 percent.

$$Q_{100} = 1350(DRNAREA)^{0.506}$$

To determine the applicability of this regression equation for comparison against the USGS stream gauges and, transitively, modeled subareas, flow values are calculated for similar sizes of drainage sub-areas represented by the two selected USGS gauges. These values are indicated alongside flows measured by the USGS stream gauges and flows from selected project subareas of similar scale in Table 2.

Table 2 Subarea Model Comparison: 100-Year Discharge (cfs)

Component	Area (SQ MI)	HEC-HMS Model	USGS Gauges	Regression Model	Regression Model Lower Limit	Regression Model Upper Limit
USGS Gauge # 10264530	1.78	-	457	1,807	332	9,837
USGS Gauge # 10264605	3.83	-	1,190	2,663	489	14,497
HEC-HMS Subarea #10.1	1.93	1,490	-	1,883	346	10,249
HEC-HMS Subarea # 3.1	3.60	2,098	-	2,581	474	14,050

There is very little correlation between flows from the various discharge calculation methods. This is expected since flooding in this area is highly variable for various reasons including large ranges in rainfall patterns, infiltration characteristics, and others. Additionally, according to the USGS Scientific Investigations Report, flood-frequency analysis in the California desert is complicated due to short annual peak-flow records and numerous zero flows and low outliers for many stream gauges. Due to the large standard error associated with the desert regression model, the HEC-HMS results fall within the allowable range. However, the size of the range provides little confidence in comparative value of the regression model results.

7.2 VERIFICATION OF OVERALL WATERSHED

Similarly, a comparison between the regression model predicted discharge for the overall watershed area and the discharge computed with the hydrologic model are included in Table 3. The results show that the hydrologic model discharge is greater than that calculated by the regression analysis, but within the range of its standard error. Given the poor draining soils in the project watershed (heavy presence of soils with HSG C) and general lack of vegetation, a higher runoff value cannot be disputed.

Table 3 Overall Model Comparison: Discharge in cfs for entire watershed (92.62 sq mi)

Storm Event	Model Q (CFS)	Gauge Q (CFS)	Regression Model	USGS STD Error (%)	USGS Upper Limit
100-yr	35,010	N/A	13,350	444.3	72,665
50-yr	30,080	N/A	7,516	356.9	34,339
25-yr	24,580	N/A	3,985	297.6	15,845
10-yr	16,870	N/A	1,493	248.1	5,198
5-yr	11,340	N/A	593	226.2	1,935
2-yr	5,610	N/A	102	214.2	320

8.0 MODELING OF CONCEPT DRAINAGE IMPROVEMENTS

The recommended drainage improvements consist of various compacted berms to contain the stormwater runoff within conveyance corridors at existing grade. To evaluate the impact of these drainage improvements, these features are coded into HEC-RAS. There are two methods to do this (1) embedding the feature into the surface model directly or (2) utilizing the HEC-RAS SA/SD (storage area/two-dimensional) connection lines. The first method (embedding) requires several steps to manipulate and patch the surface DEM with the proposed features. The simplified method of utilizing connection lines with elevated surface to represent compacted berm features provides the same results with less input required.

The simplified method (SA/SD connections) is much more efficient when evaluating multiple alignments and /or berm locations. Figure 12 shows the 3D-polyline patch lines and HEC-RAS connection lines over the existing topography, and Figure 13 shows the proposed topography with the berms in-place, in addition to HEC-RAS berms.

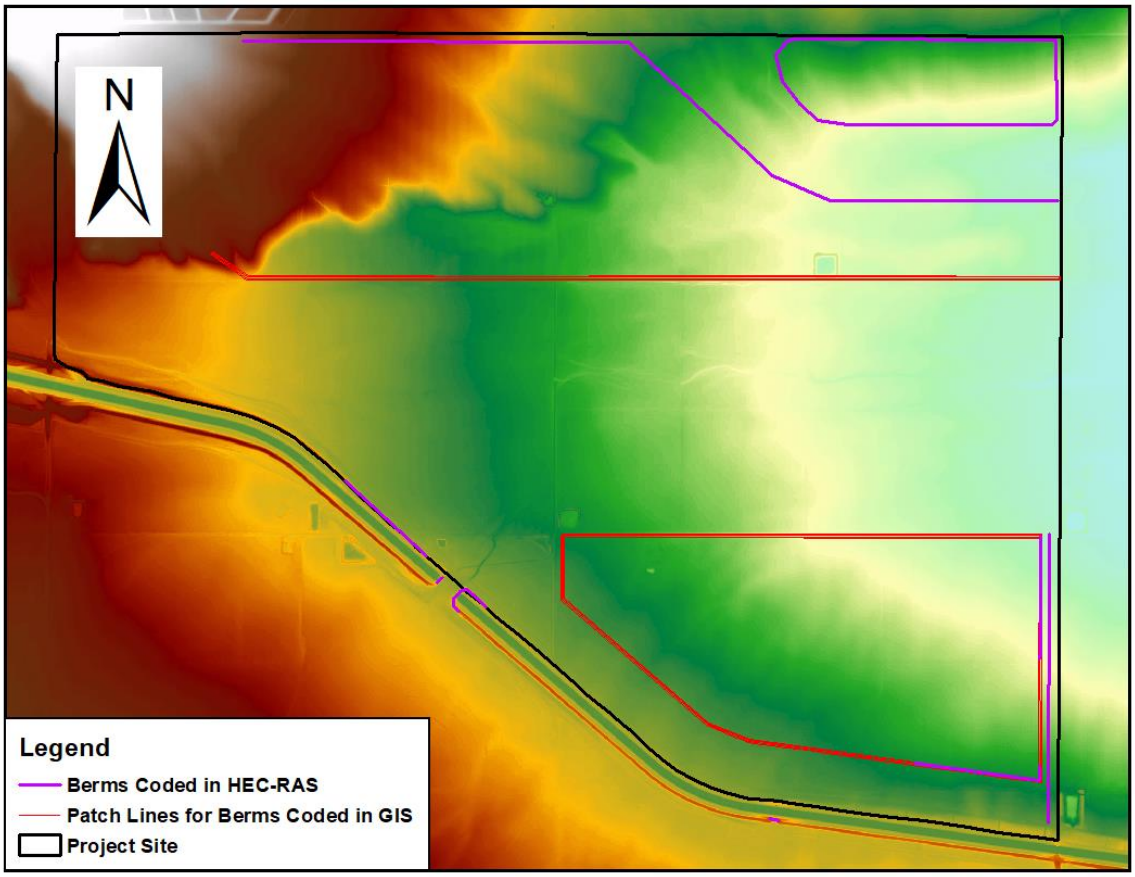


Figure 12 – Berm Patch Linework Over Existing Topography

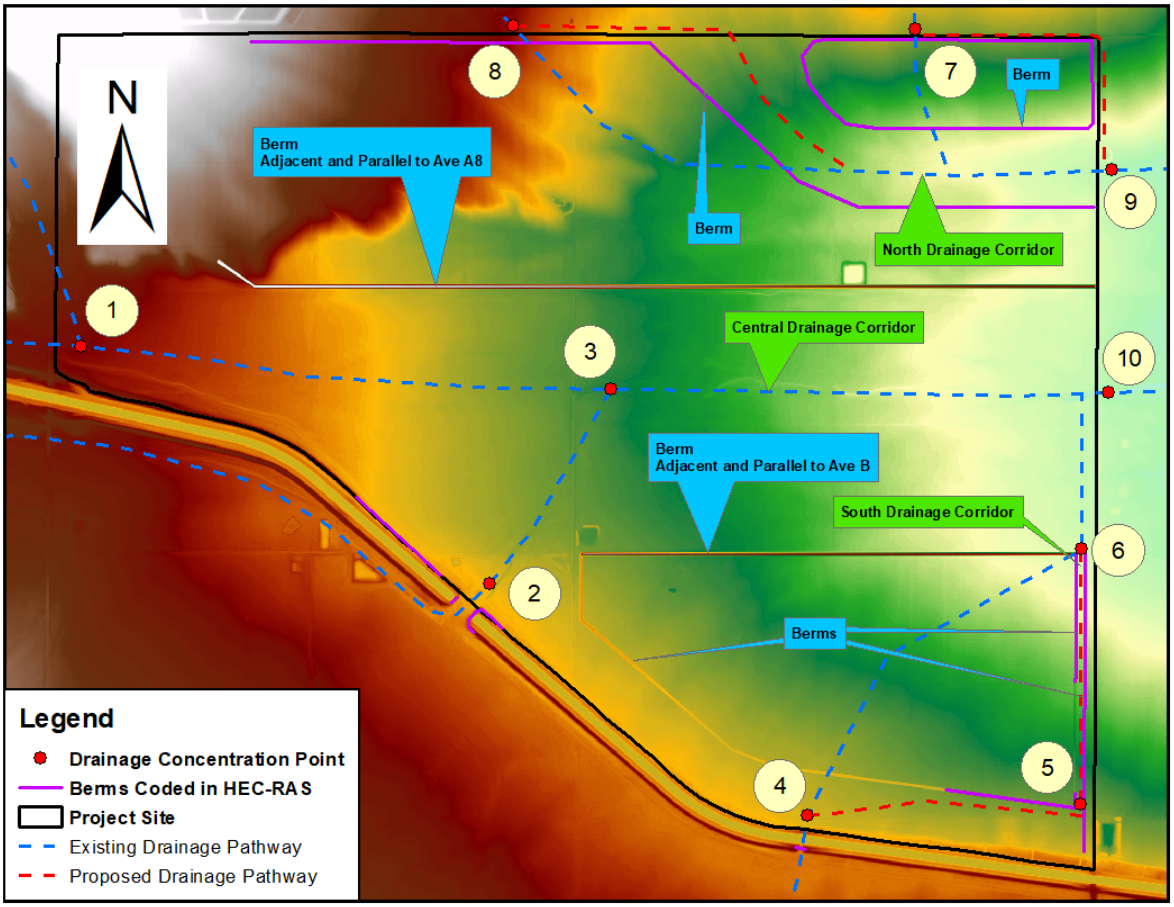


Figure 13 – Proposed Conditions Topography, Berms and Flow Paths

These recommended drainage improvements convey offsite flow through three primary drainage corridors: (1) north, (2) central, and (3) south. The north corridor conveys the flow from Pescado Creek. The central corridor conveys the flow from Oso Canyon Creek and Big Sycamore Canyon Creek. The southern corridor conveys the flow coming from across the canal drainage overchute from the south. All three corridors release flow at their pre-project location.

Referring back to Table 1 (the summary of the site peak discharges), the primary corridor conveys the peak discharge associated with point 3, which takes the flow from points 1 and 2. The northern corridor conveys the peak discharge(s) associated with point 8 to point 9, just downstream of where this flow crosses 280th Street. The relatively small amount of flow associated with point 7 is pushed around the northeastern corner of the site and south to where it combines with the north drainage corridor flow just upstream of point 9. The southern corridor conveys the peak discharge of point 5, which takes the flow coming from point 4. The flow conveyed through the south corridor mixes with the flow in the central drainage corridor beginning just north of Ave. B at point 6. The combined flow then crosses 280th Street at point 10.

The drainage corridor existing invert elevations remain under this recommended improvement scenario. The height of the berms is determined by whichever height is greater between 1) the maximum depth of

runoff plus the necessary freeboard and 2) the height of berm required for recharge operations, when adjacent to flooding corridors.

Figure 14 details the maximum depth distribution for 100-year flooding with the recommended drainage improvements in-place, and Figure 15 details the maximum velocity distribution. It is assumed rainfall runoff accumulation directly on recharge areas will be stored by the recharge basins, or severely lagged in time as it passes through the recharge basin network with a net result of not adding to peak discharge leaving the site.

Similar to existing conditions, a Manning's n-value of 0.045 is applied to the majority of floodplain reaches modeled under the two-dimensional hydraulic domain and the entirety of the project site.

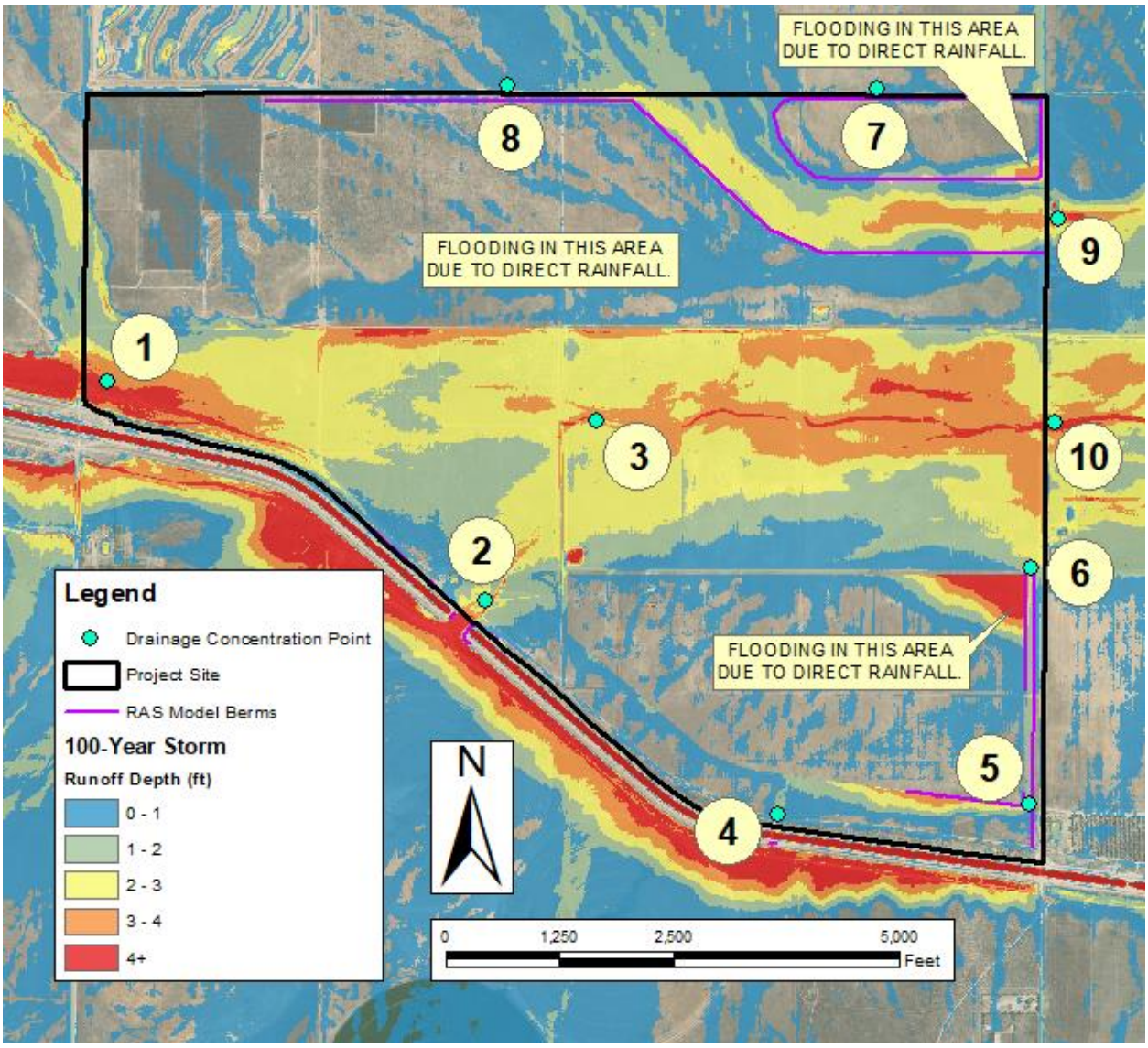


Figure 14 – Project Site 100-Year Proposed Conditions Flooding – Maximum Depth

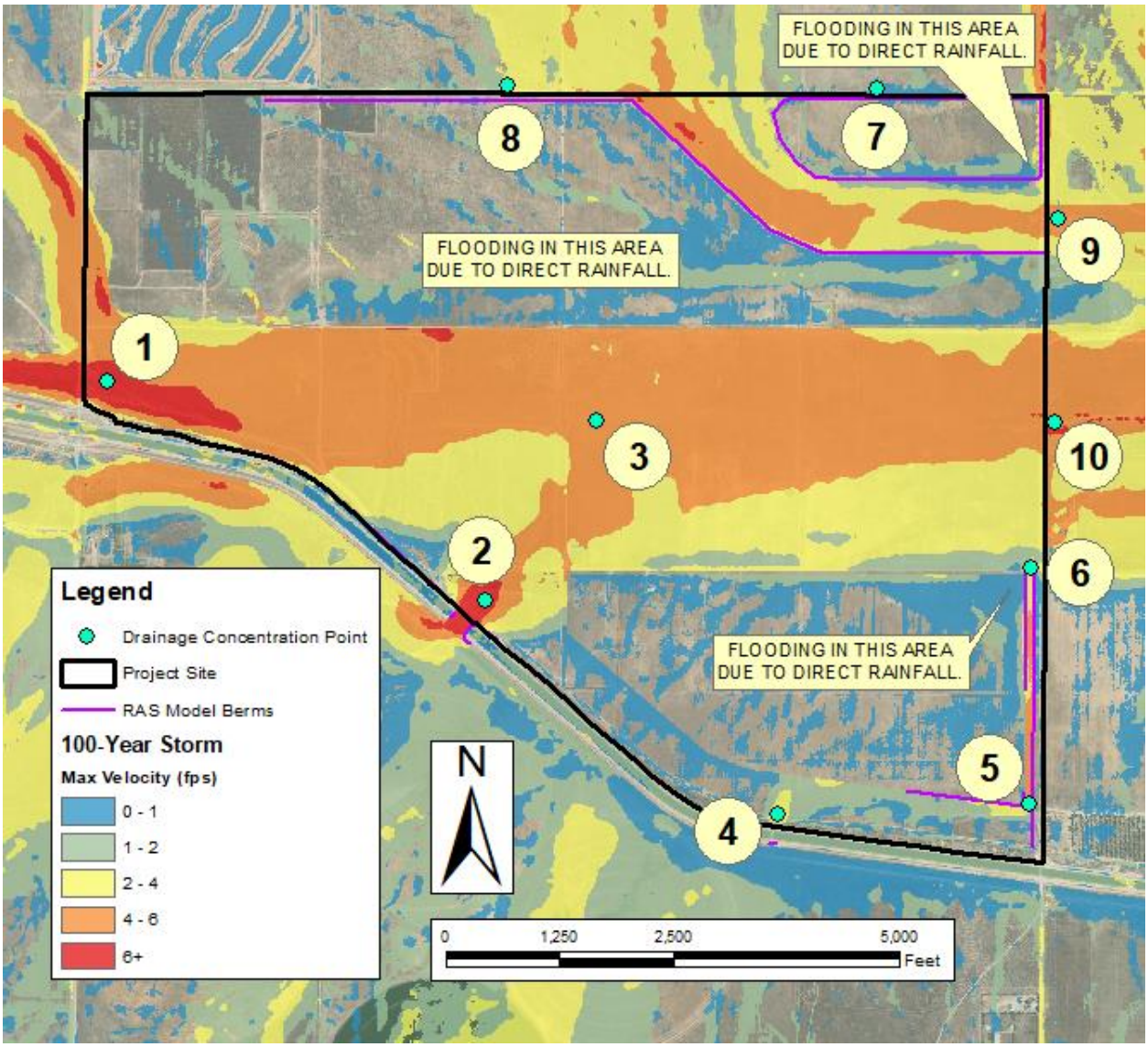


Figure 15 – Project Site 100-Year Proposed Conditions Flooding – Maximum Velocity

Upon comparison of the existing-condition depth and velocity maps to those of the proposed condition – comparing Figure 10 to Figure 14 and Figure 11 to Figure 15 – it is apparent that the confinement of the flow in these three proposed corridors does not result in a substantial increase in depth nor velocity to the point of major concern. The existing flow path alignments are largely maintained to ensure little-to-no impact on any development surrounding the project site. See Appendix D.2 for additional discussion of the HEC-RAS results.

Figure 16, below, shows the locations of cross-sections sampled along the recommended drainage corridor berms. The recommended cross-sections are included in Appendix F. Each section can be identified by the associated letter ID, included in Figure 16 adjacent to each respective cross-section.

The red lines in Figure 16 represent the berm cross-section generalize location are not drawn to scale in terms of length and are show relatively large here to indicate cross-section location more clearly.

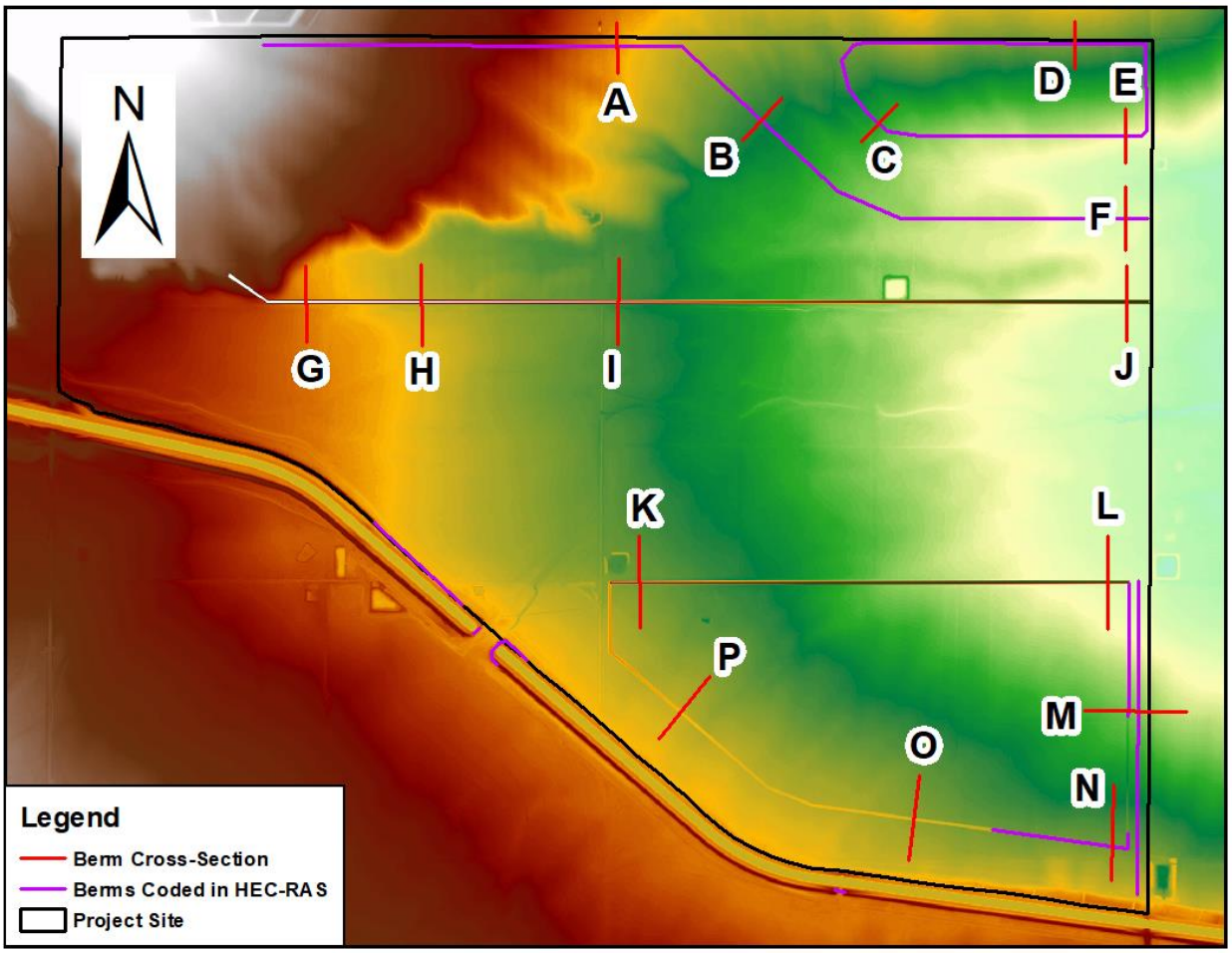
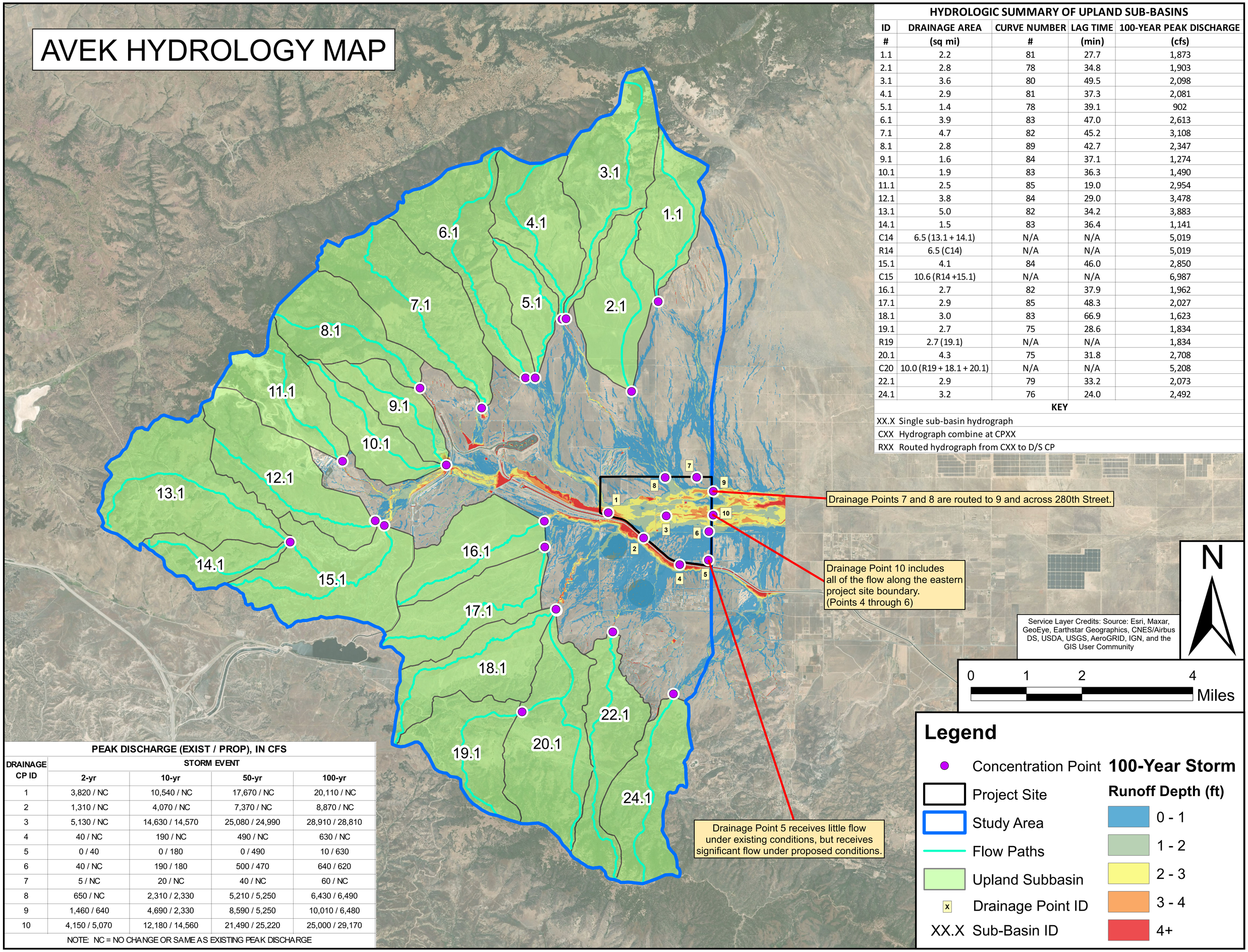


Figure 16 – Typical Berm Cross-Section General Location

APPENDIX A

Hydrology Map

AVEK HYDROLOGY MAP



HYDROLOGIC SUMMARY OF UPLAND SUB-BASINS

ID #	DRAINAGE AREA (sq mi)	CURVE NUMBER #	LAG TIME (min)	100-YEAR PEAK DISCHARGE (cfs)
1.1	2.2	81	27.7	1,873
2.1	2.8	78	34.8	1,903
3.1	3.6	80	49.5	2,098
4.1	2.9	81	37.3	2,081
5.1	1.4	78	39.1	902
6.1	3.9	83	47.0	2,613
7.1	4.7	82	45.2	3,108
8.1	2.8	89	42.7	2,347
9.1	1.6	84	37.1	1,274
10.1	1.9	83	36.3	1,490
11.1	2.5	85	19.0	2,954
12.1	3.8	84	29.0	3,478
13.1	5.0	82	34.2	3,883
14.1	1.5	83	36.4	1,141
C14	6.5 (13.1 + 14.1)	N/A	N/A	5,019
R14	6.5 (C14)	N/A	N/A	5,019
15.1	4.1	84	46.0	2,850
C15	10.6 (R14 +15.1)	N/A	N/A	6,987
16.1	2.7	82	37.9	1,962
17.1	2.9	85	48.3	2,027
18.1	3.0	83	66.9	1,623
19.1	2.7	75	28.6	1,834
R19	2.7 (19.1)	N/A	N/A	1,834
20.1	4.3	75	31.8	2,708
C20	10.0 (R19 + 18.1 + 20.1)	N/A	N/A	5,208
22.1	2.9	79	33.2	2,073
24.1	3.2	76	24.0	2,492

KEY

XX.X Single sub-basin hydrograph
CXX Hydrograph combine at CPXX
RXX Routed hydrograph from CXX to D/S CP

PEAK DISCHARGE (EXIST / PROP), IN CFS

DRAINAGE CP ID	STORM EVENT 2-yr	10-yr	50-yr	100-yr
1	3,820 / NC	10,540 / NC	17,670 / NC	20,110 / NC
2	1,310 / NC	4,070 / NC	7,370 / NC	8,870 / NC
3	5,130 / NC	14,630 / 14,570	25,080 / 24,990	28,910 / 28,810
4	40 / NC	190 / NC	490 / NC	630 / NC
5	0 / 40	0 / 180	0 / 490	10 / 630
6	40 / NC	190 / 180	500 / 470	640 / 620
7	5 / NC	20 / NC	40 / NC	60 / NC
8	650 / NC	2,310 / 2,330	5,210 / 5,250	6,430 / 6,490
9	1,460 / 640	4,690 / 2,330	8,590 / 5,250	10,010 / 6,480
10	4,150 / 5,070	12,180 / 14,560	21,490 / 25,220	25,000 / 29,170

NOTE: NC = NO CHANGE OR SAME AS EXISTING PEAK DISCHARGE

APPENDIX B

Hydrologic Physical Parameter Summaries

TABLE B1:CN VALUE SUMMARY

TABLE B2:TC VALUE SUMMARY

APPENDIX B

TABLE B1

CN VALUE SUMMARY

SUBBASIN	WEIGHTED CN
1.1	81
1.2	74
2.1	78
2.2	77
3.1	80
3.2	73
4.1	81
5.1	78
5.2	71
6.1	83
7.1	82
7.5	77
8.1	89
9.1	84
10.1	83
11.1	85
11.2	79
12.1	84
13.1	82
14.1	83
15.1	84
16.1	82
17.1	85
18.1	83
18.2	75
19.1	75
20.1	75
21.1	79
22.1	79
23.1	82
24.1	76
24.2	73
RAS DOMAIN	76

APPENDIX B

TABLE B2

TC VALUE SUMMARY

Basin	Total Concentration Time (minutes)	Lag Time (minutes)	Lag Time (hours)
1.1	46.1	27.7	0.46
2.1	58.1	34.8	0.58
3.1	82.6	49.5	0.83
4.1	62.1	37.3	0.62
5.1	65.1	39.1	0.65
6.1	78.3	47.0	0.78
7.1	75.4	45.2	0.75
8.1	71.2	42.7	0.71
9.1	61.8	37.1	0.62
10.1	60.5	36.3	0.60
11.1	31.7	19.0	0.32
12.1	48.3	29.0	0.48
13.1	57.0	34.2	0.57
14.1	60.6	36.4	0.61
15.1	76.7	46.0	0.77
16.1	63.2	37.9	0.63
17.1	80.6	48.3	0.81
18.1	111.4	66.9	1.11
19.1	47.6	28.6	0.48
20.1	52.9	31.8	0.53
22.1	55.3	33.2	0.55
24.1	40.1	24.0	0.40

APPENDIX C

Rainfall Data

NOAA Atlas 14, Volume 6, Version 2
Location name: Tehachapi, California, USA*
Latitude: 34.8186°, Longitude: -118.6964°
Elevation: 3057.57 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.084 (0.070-0.103)	0.108 (0.089-0.131)	0.139 (0.115-0.170)	0.166 (0.136-0.205)	0.204 (0.161-0.260)	0.235 (0.182-0.306)	0.267 (0.201-0.357)	0.301 (0.221-0.415)	0.349 (0.246-0.502)	0.388 (0.263-0.578)
10-min	0.121 (0.100-0.147)	0.154 (0.128-0.188)	0.200 (0.165-0.244)	0.238 (0.195-0.293)	0.292 (0.231-0.373)	0.336 (0.260-0.439)	0.382 (0.289-0.512)	0.432 (0.317-0.594)	0.501 (0.352-0.720)	0.557 (0.377-0.829)
15-min	0.146 (0.121-0.178)	0.186 (0.154-0.227)	0.241 (0.199-0.295)	0.288 (0.236-0.355)	0.354 (0.280-0.451)	0.407 (0.315-0.530)	0.462 (0.349-0.619)	0.522 (0.383-0.719)	0.606 (0.426-0.871)	0.673 (0.457-1.00)
30-min	0.204 (0.169-0.248)	0.260 (0.215-0.317)	0.337 (0.278-0.412)	0.401 (0.329-0.495)	0.493 (0.390-0.630)	0.567 (0.439-0.740)	0.645 (0.487-0.863)	0.728 (0.534-1.00)	0.845 (0.594-1.22)	0.939 (0.637-1.40)
60-min	0.292 (0.242-0.356)	0.373 (0.309-0.455)	0.483 (0.399-0.591)	0.575 (0.471-0.710)	0.707 (0.559-0.903)	0.813 (0.629-1.06)	0.925 (0.698-1.24)	1.04 (0.766-1.44)	1.21 (0.851-1.74)	1.35 (0.913-2.01)
2-hr	0.444 (0.368-0.541)	0.576 (0.477-0.702)	0.750 (0.619-0.917)	0.892 (0.731-1.10)	1.09 (0.861-1.39)	1.24 (0.960-1.62)	1.39 (1.05-1.87)	1.55 (1.14-2.14)	1.77 (1.24-2.54)	1.93 (1.31-2.87)
3-hr	0.577 (0.478-0.703)	0.752 (0.623-0.917)	0.980 (0.809-1.20)	1.17 (0.954-1.44)	1.42 (1.12-1.81)	1.61 (1.24-2.10)	1.80 (1.36-2.41)	2.00 (1.47-2.75)	2.26 (1.59-3.24)	2.45 (1.66-3.65)
6-hr	0.882 (0.731-1.08)	1.16 (0.957-1.41)	1.51 (1.25-1.85)	1.79 (1.47-2.21)	2.17 (1.72-2.77)	2.46 (1.90-3.21)	2.74 (2.07-3.67)	3.03 (2.22-4.17)	3.41 (2.40-4.90)	3.69 (2.50-5.50)
12-hr	1.25 (1.04-1.52)	1.66 (1.37-2.02)	2.18 (1.80-2.67)	2.60 (2.13-3.21)	3.16 (2.50-4.04)	3.58 (2.78-4.68)	4.01 (3.03-5.36)	4.43 (3.25-6.11)	4.99 (3.51-7.18)	5.41 (3.67-8.06)
24-hr	1.66 (1.47-1.90)	2.22 (1.97-2.56)	2.96 (2.61-3.42)	3.55 (3.11-4.13)	4.35 (3.68-5.23)	4.95 (4.11-6.09)	5.55 (4.50-7.00)	6.17 (4.85-8.00)	6.99 (5.27-9.45)	7.60 (5.54-10.7)
2-day	2.02 (1.79-2.32)	2.75 (2.44-3.17)	3.71 (3.28-4.28)	4.48 (3.93-5.22)	5.52 (4.68-6.65)	6.31 (5.23-7.76)	7.10 (5.75-8.95)	7.90 (6.22-10.3)	8.97 (6.77-12.1)	9.78 (7.12-13.7)
3-day	2.24 (1.99-2.58)	3.09 (2.74-3.56)	4.21 (3.72-4.86)	5.11 (4.48-5.95)	6.32 (5.36-7.61)	7.24 (6.01-8.91)	8.17 (6.61-10.3)	9.12 (7.17-11.8)	10.4 (7.83-14.1)	11.4 (8.27-15.9)
4-day	2.38 (2.11-2.74)	3.31 (2.93-3.81)	4.53 (4.01-5.24)	5.53 (4.84-6.43)	6.87 (5.82-8.27)	7.89 (6.54-9.70)	8.92 (7.22-11.2)	9.98 (7.85-12.9)	11.4 (8.59-15.4)	12.5 (9.09-17.5)
7-day	2.68 (2.38-3.08)	3.75 (3.32-4.32)	5.18 (4.57-5.98)	6.34 (5.56-7.38)	7.93 (6.72-9.55)	9.15 (7.59-11.3)	10.4 (8.41-13.1)	11.7 (9.17-15.1)	13.4 (10.1-18.1)	14.7 (10.7-20.6)
10-day	2.83 (2.51-3.25)	3.98 (3.53-4.58)	5.52 (4.88-6.38)	6.80 (5.96-7.91)	8.54 (7.24-10.3)	9.89 (8.21-12.2)	11.3 (9.12-14.2)	12.7 (9.98-16.5)	14.6 (11.0-19.8)	16.1 (11.7-22.6)
20-day	3.20 (2.84-3.68)	4.58 (4.06-5.27)	6.46 (5.71-7.46)	8.03 (7.04-9.35)	10.2 (8.67-12.3)	12.0 (9.92-14.7)	13.7 (11.1-17.3)	15.6 (12.3-20.2)	18.1 (13.7-24.5)	20.1 (14.6-28.2)
30-day	3.68 (3.27-4.24)	5.29 (4.69-6.10)	7.52 (6.65-8.68)	9.40 (8.24-10.9)	12.1 (10.2-14.5)	14.2 (11.8-17.4)	16.3 (13.2-20.6)	18.6 (14.7-24.2)	21.8 (16.4-29.5)	24.3 (17.7-34.0)
45-day	4.34 (3.85-4.99)	6.23 (5.52-7.17)	8.86 (7.83-10.2)	11.1 (9.74-12.9)	14.3 (12.1-17.3)	16.9 (14.0-20.8)	19.6 (15.9-24.7)	22.4 (17.6-29.1)	26.4 (19.9-35.7)	29.5 (21.4-41.3)
60-day	4.89 (4.34-5.62)	6.96 (6.17-8.02)	9.88 (8.73-11.4)	12.4 (10.9-14.4)	16.0 (13.6-19.3)	18.9 (15.7-23.3)	22.0 (17.8-27.7)	25.2 (19.8-32.7)	29.7 (22.4-40.1)	33.2 (24.2-46.6)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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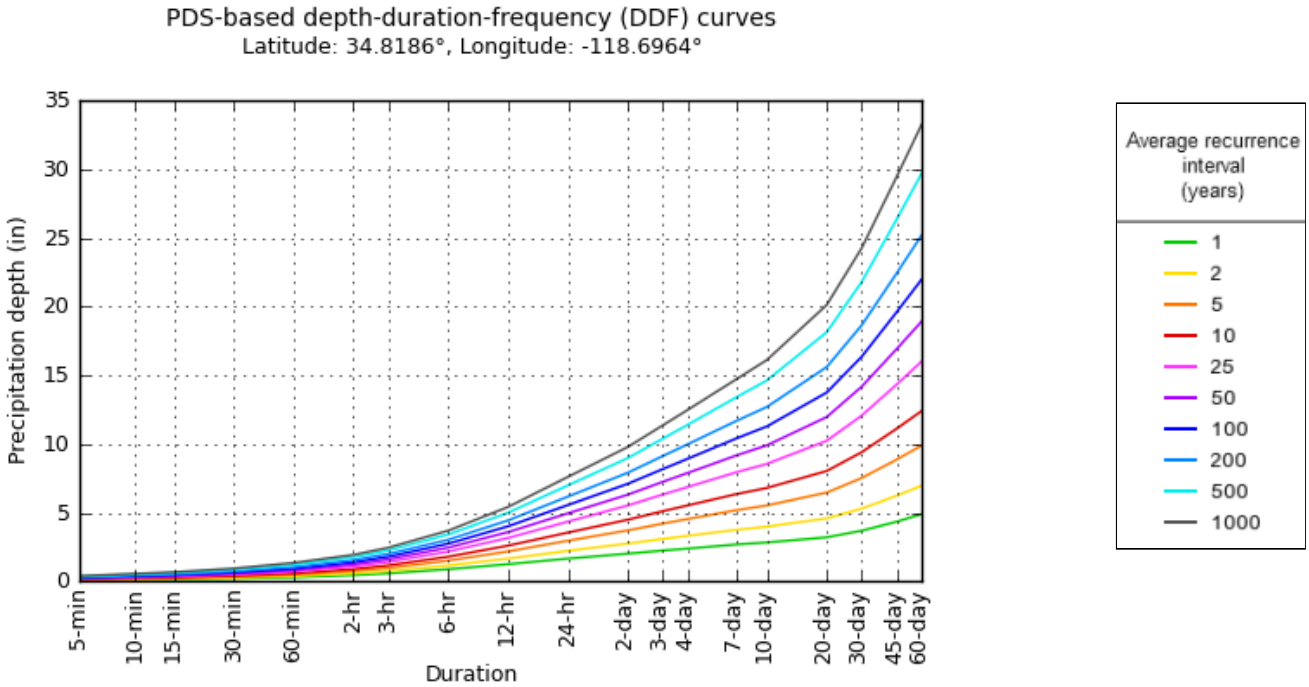
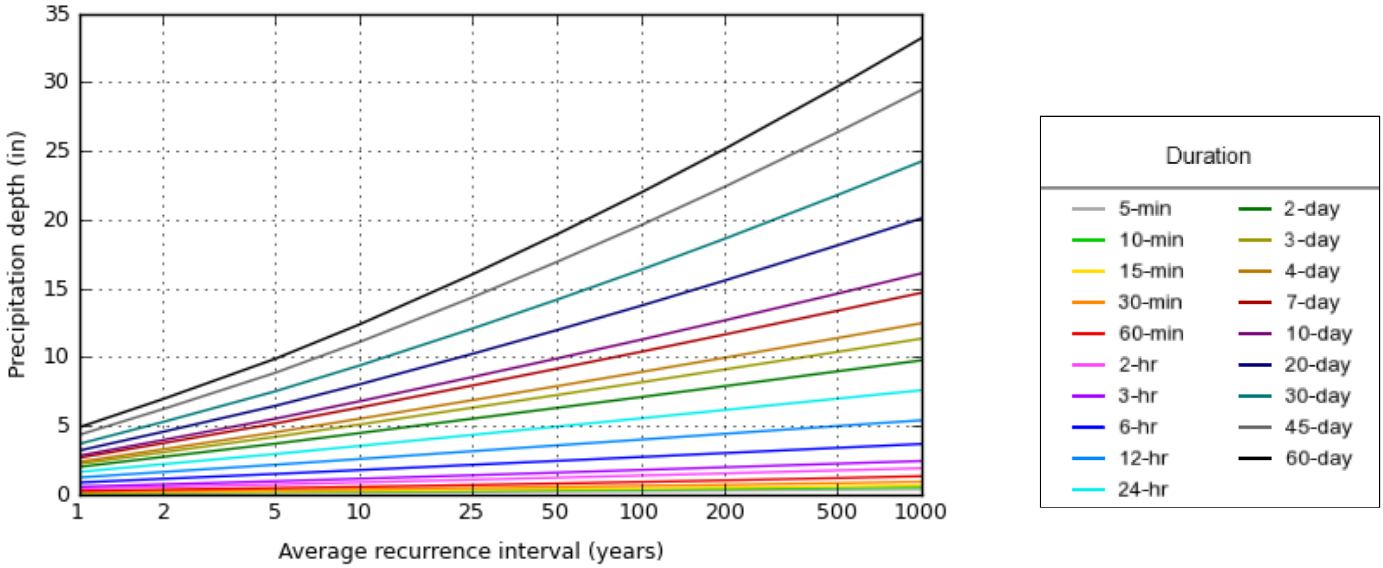
PF graphical





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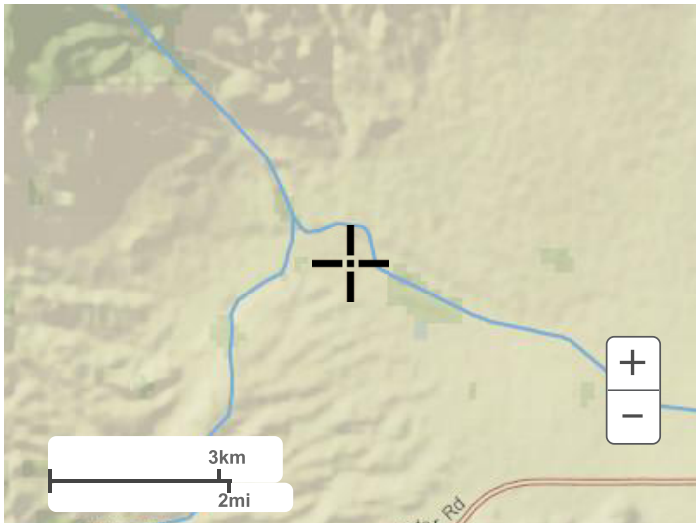
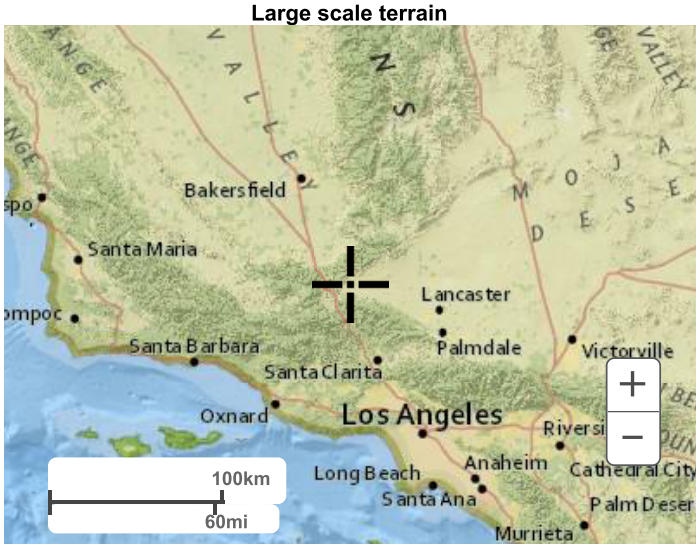
Maps & aerials

Small scale terrain



Large scale terrain



Large scale map

Large scale aerial

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Disclaimer

APPENDIX D

Rainfall-Runoff Modeling Results

APPENDIX D.1

SUMMARY OF RESULTS

TABLE D1: HEC-HMS RESULTS SUMMARY

TABLE D2: HEC-RAS RESULTS SUMMARY

APPENDIX D.1 - TABLE D1 HEC-HMS RESULTS SUMMARY - PEAK DISCHARGES						
INFLOW LOCATION	STORM EVENT FREQUENCY (YEARS)					
(NAME OF HMS OUTFLOW NODE /RAS BOUNDARY INFLOW LINE)	2	5	10	25	50	100
	PEAK Q (CFS)	PEAK Q (CFS)	PEAK Q (CFS)	PEAK Q (CFS)	PEAK Q (CFS)	PEAK Q (CFS)
INFLOW_1.1	330	629	893	1,274	1,571	1,873
INFLOW_2.1	271	572	847	1,252	1,573	1,903
INFLOW_3.1	346	679	978	1,411	1,750	2,098
INFLOW_4.1	366	698	991	1,415	1,744	2,081
INFLOW_5.1	128	271	402	594	745	902
INFLOW_6.1	519	935	1,297	1,812	2,209	2,613
INFLOW_7.1	582	1,077	1,511	2,133	2,616	3,108
INFLOW_8.1	633	1,001	1,303	1,719	2,033	2,347
INFLOW_9.1	268	471	645	892	1,082	1,274
INFLOW_10.1	296	534	740	1,033	1,260	1,490
INFLOW_9.1_10.1	564	1,002	1,385	1,925	2,341	2,763
INFLOW_11.1	660	1,132	1,532	2,093	2,522	2,954
INFLOW_12.1	732	1,287	1,763	2,437	2,954	3,478
INFLOW_13.3	1,388	2,502	3,469	4,846	5,908	6,987
INFLOW_16.2	367	681	955	1,347	1,652	1,962
INFLOW_17.1	449	771	1,046	1,432	1,728	2,027
INFLOW_18.11	728	1,542	2,294	3,408	4,293	5,208
INFLOW_21.2	318	648	945	1,380	1,721	2,073
INFLOW_24.1	297	691	1,057	1,603	2,039	2,492

APPENDIX D.1 - TABLE D2
HEC-RAS RESULTS SUMMARY

PEAK DISCHARGES AT DRAINAGE POINTS - EXISTING

DRAINAGE POINT	STORM FREQUENCY (YRS)						DRAINAGE POINTS 9 & 10 ACCUMULATED VOLUME, OR VOLUME OF WATER LEAVING THE SITE (EXISTING CONDITIONS, AC-FT)
	2	5	10	25	50	100	
	PEAK Q (CFS)	PEAK Q (CFS)	PEAK Q (CFS)	PEAK Q (CFS)	PEAK Q (CFS)	PEAK Q (CFS)	
1	3,819	7,306	10,544	14,794	17,672	20,107	
2	1,306	2,768	4,074	5,935	7,373	8,868	
3	5,130	10,096	14,625	20,778	25,075	28,908	
4	41	100	185	348	486	630	
5	0	1	2	3	4	6	
6	42	104	193	358	497	643	
7	4	11	19	32	44	58	15,240
8	647	1,508	2,308	3,877	5,211	6,427	
9	1,455	3,168	4,689	6,964	8,588	10,005	
10	4,147	8,169	12,176	17,623	21,486	25,003	

PEAK DISCHARGES AT DRAINAGE POINTS - PROPOSED

DRAINAGE POINT	STORM FREQUENCY (YRS)						DRAINAGE POINTS 9 & 10 ACCUMULATED VOLUME, OR VOLUME OF WATER LEAVING THE SITE (PROPOSED CONDITIONS, AC-FT)
	2	5	10	25	50	100	
	PEAK Q (CFS)	PEAK Q (CFS)	PEAK Q (CFS)	PEAK Q (CFS)	PEAK Q (CFS)	PEAK Q (CFS)	
1	3,819	7,306	10,544	14,795	17,677	20,108	
2	1,306	2,768	4,074	5,935	7,373	8,868	
3	5,125	10,072	14,573	20,700	24,986	28,808	
4	41	100	185	348	486	630	
5	30	92	184	341	479	628	
6	40	102	184	340	474	619	
7	4	11	19	32	44	58	15,078
8	654	1,515	2,335	3,917	5,250	6,493	
9	637	1,492	2,331	3,896	5,247	6,478	
10	5,067	10,017	14,557	20,811	25,216	29,165	

APPENDIX D.2

HEC-RAS OUTPUT HYDROGRAPHS

Appendix D.2 – HEC-RAS Output Hydrographs

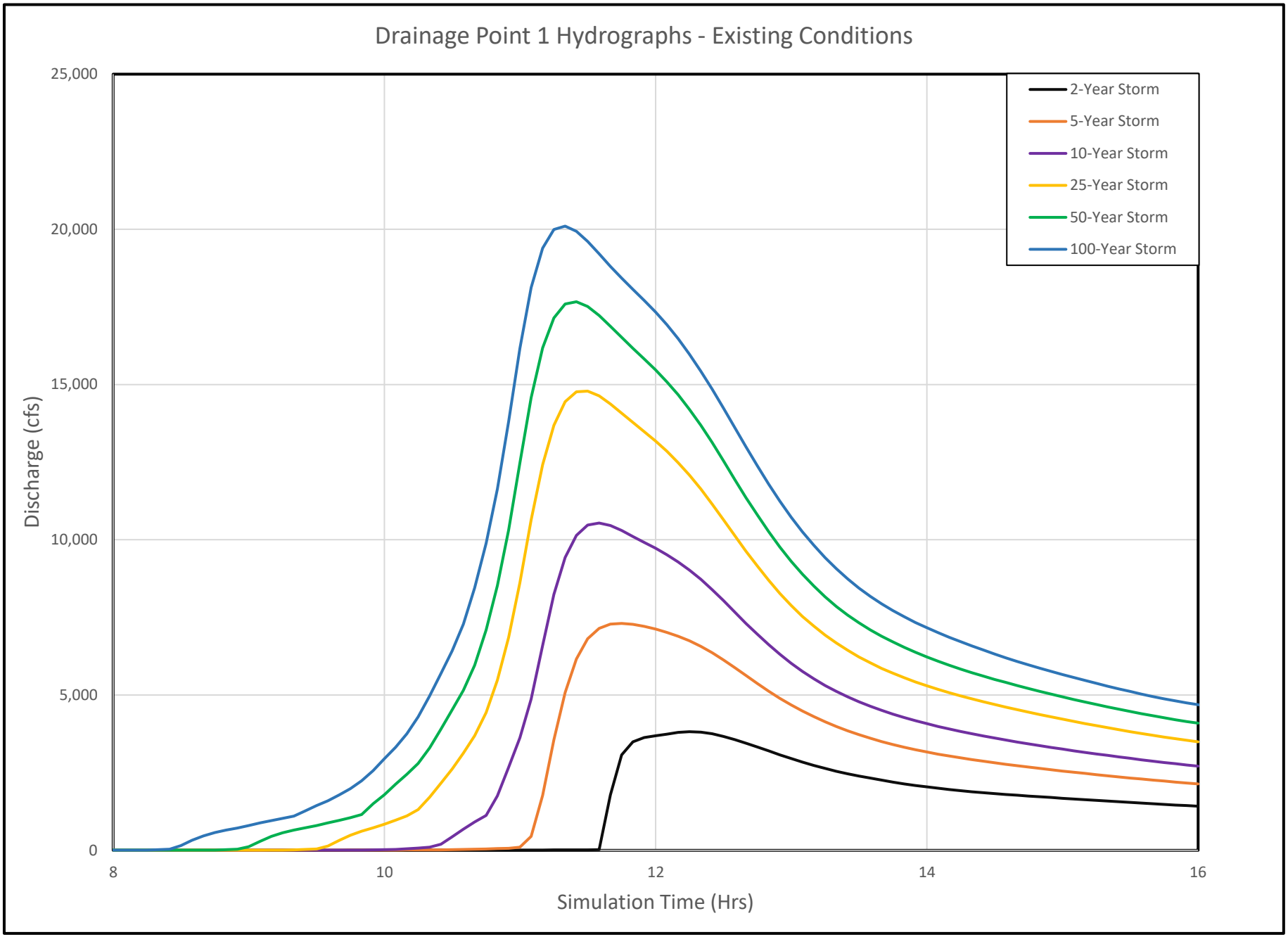
This appendix is being provided to document output hydrographs general shapes are reasonable and model run times capture the peak rate of flow. Additional explanation is provided to substantiate typical modeling run errors and model run times used for peak flow vs run time required to document total runoff volumes.

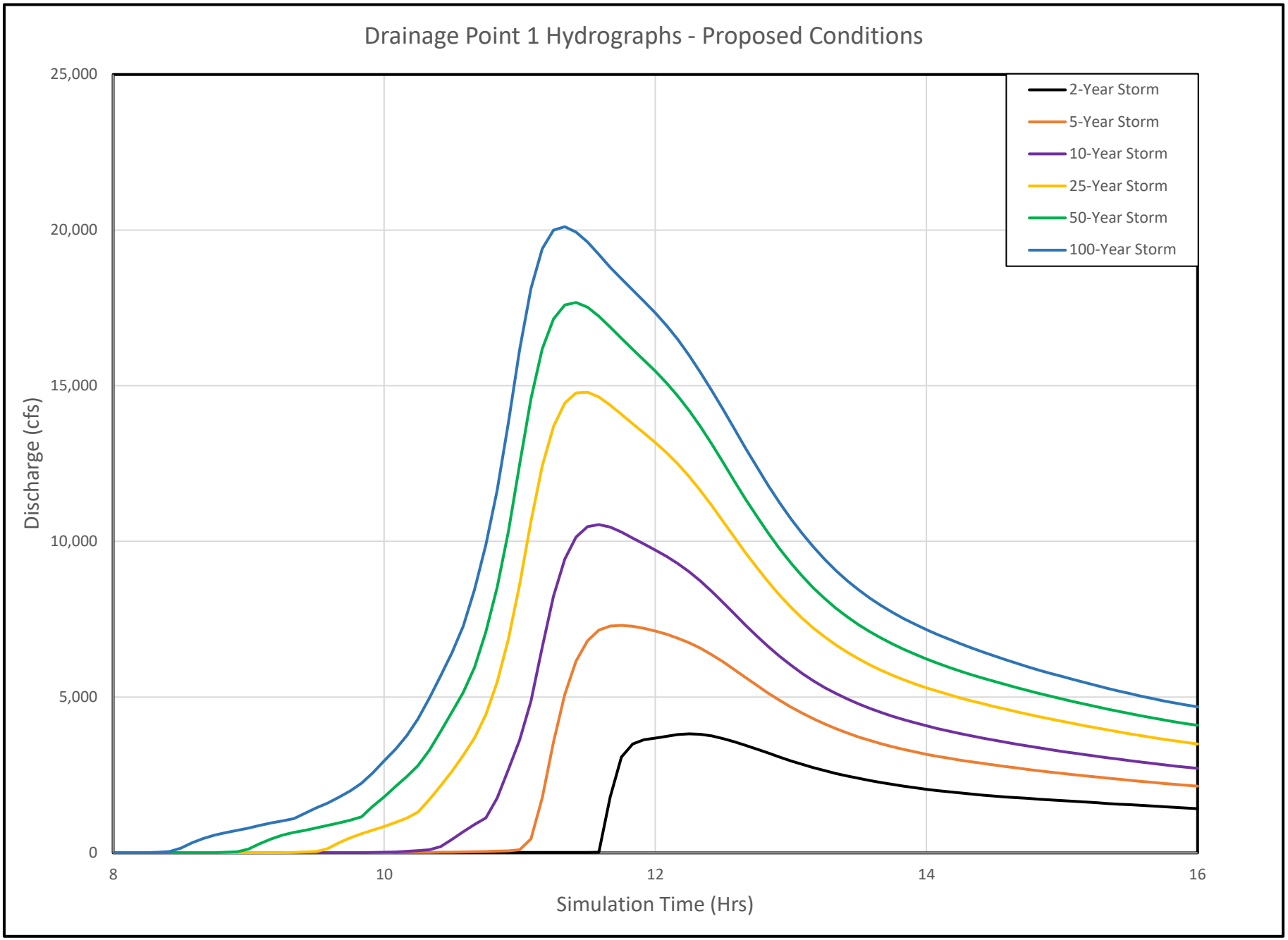
Both of the existing and proposed condition simulations of the 100-year-storm yielded an approximate 0.008-percent volume-conservation error. This translates to a volume error of just under 1.5 acre-feet, which is minor when compared to the 18,552 acre-feet entering the model domain via inflow nodes along the boundary and rain-on-grid precipitation.

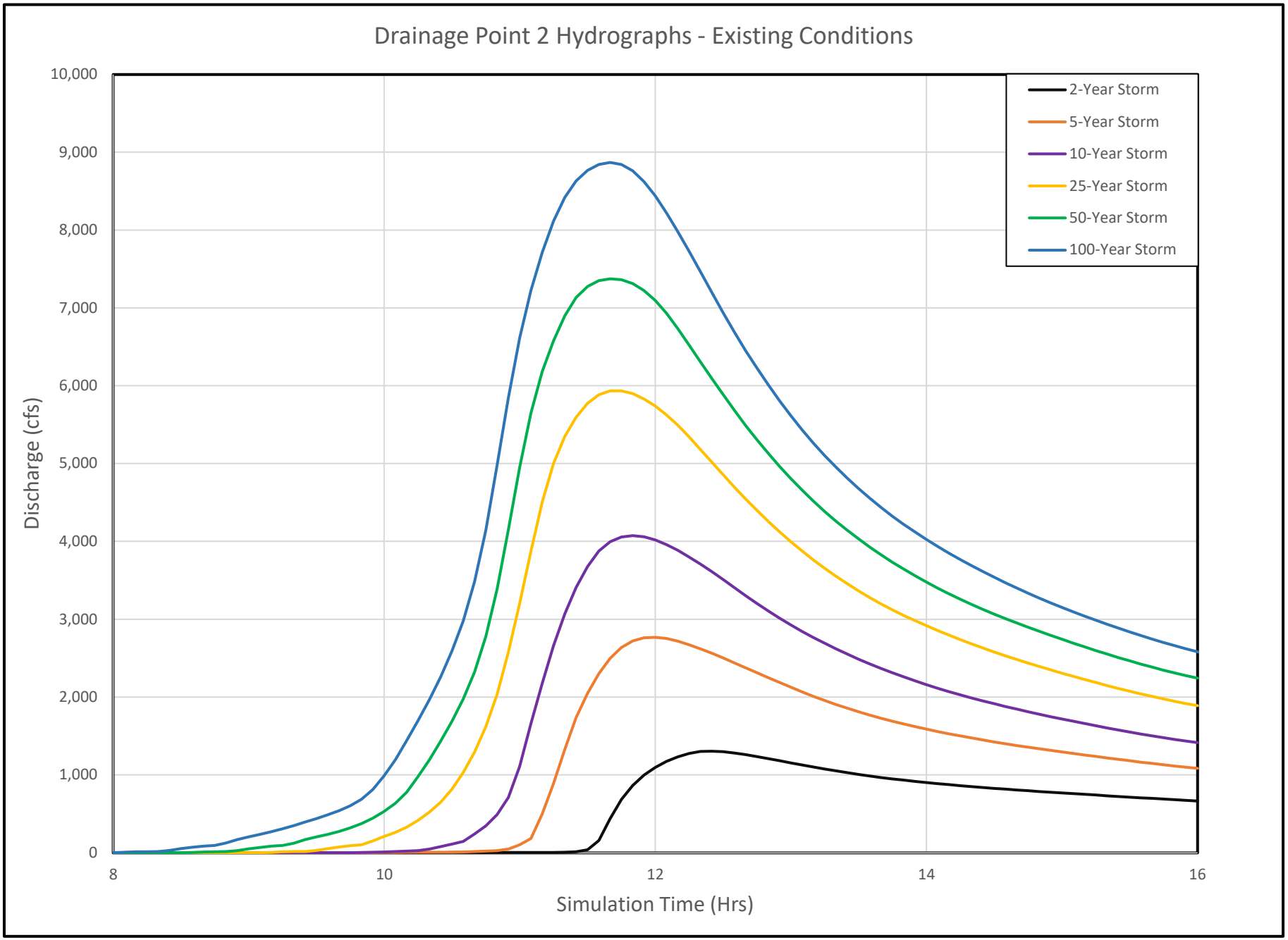
Although several water surface elevation errors – errors associated with balancing the water surface elevation between two cells in the HEC-RAS computational domain – appear in the model output, these errors were determined not to have a major impact on the modeling results, at least as far as the peak discharges are concerned. These water surface elevation errors often arise from steep slopes in the topography or very shallow flow depths.

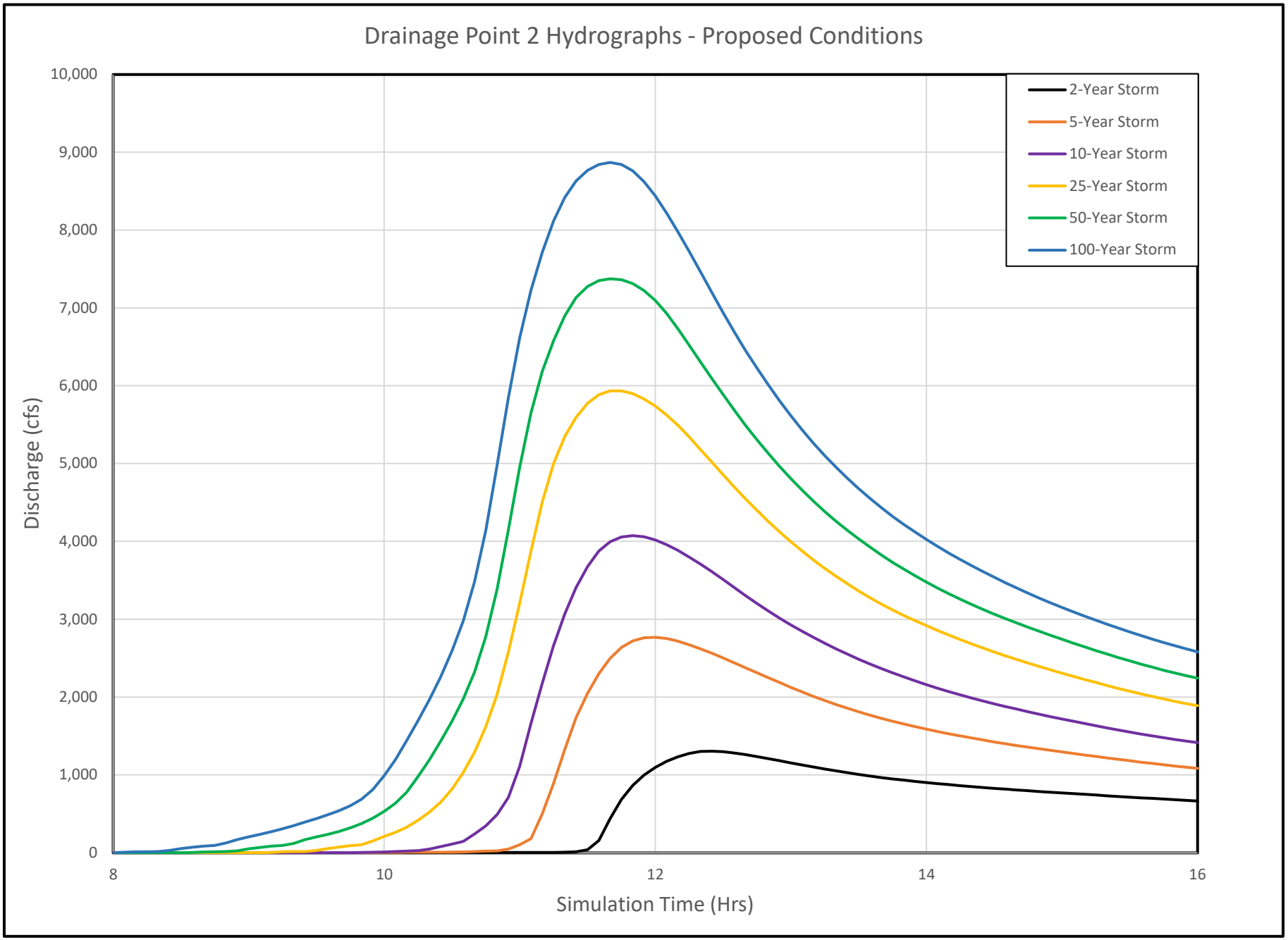
The following pages of Appendix D.2 contain the existing and proposed conditions hydrographs for each of the storm events – the 2, 5, 10, 25, 50 and 100-year storms – at each of the ten drainage points-of-interest. In the interest of time and efficiency, the simulations for the lower-return-period storm events were only run to the point of the sixteenth hour in the simulation, unlike the 100-year simulations, for which the full 48-hour simulation was executed. The hydrographs have accordingly been trimmed only to show hours 8 through 16 of the simulation.

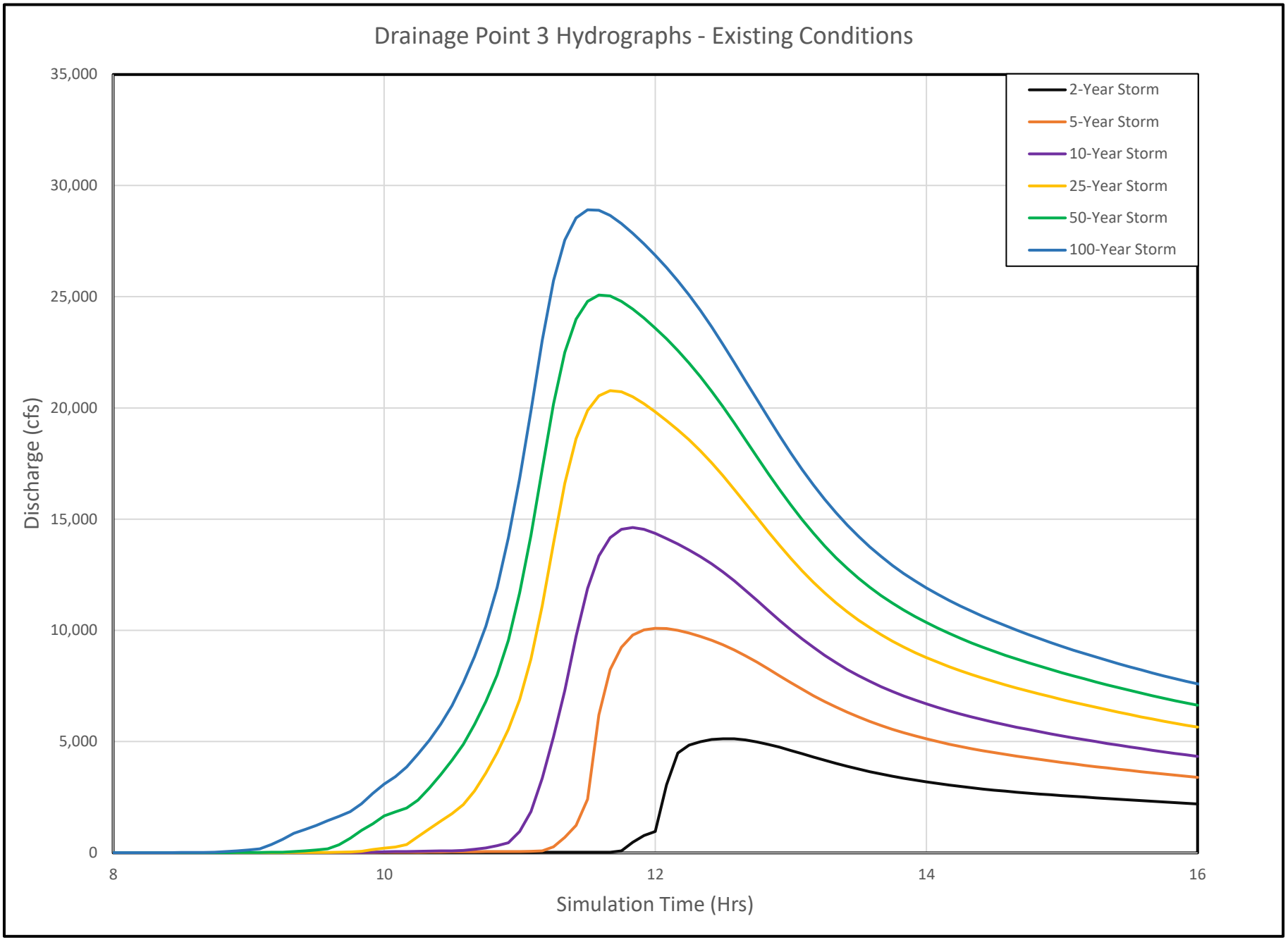
Several drainage concentration points show peak discharges under proposed conditions that closely match those of the existing conditions. Points 1, 2, 3, 4, 7 and 8 all fit this description. The remaining points – 5, 6, 9 and 10 – each had proposed conditions discharges that noticeably deviated from those of existing conditions. Point 5, which receives little-to-no discharge under existing conditions, receives all of the discharge of point 4 under proposed conditions. The point 6 existing conditions hydrograph has a particularly unique shape, with two local peaks: the first, small peak is produced by the conveyance of the local rainfall, while the second, larger peak is the flow being conveyed from upstream. Under proposed conditions, the small peak associated with the direct rainfall is not quite as noticeable. Drainage points 9 and 10 deviate from existing conditions in terms of peak discharge, due to flow from Pescado Creek being kept from joining with the primary, central drainage corridor.

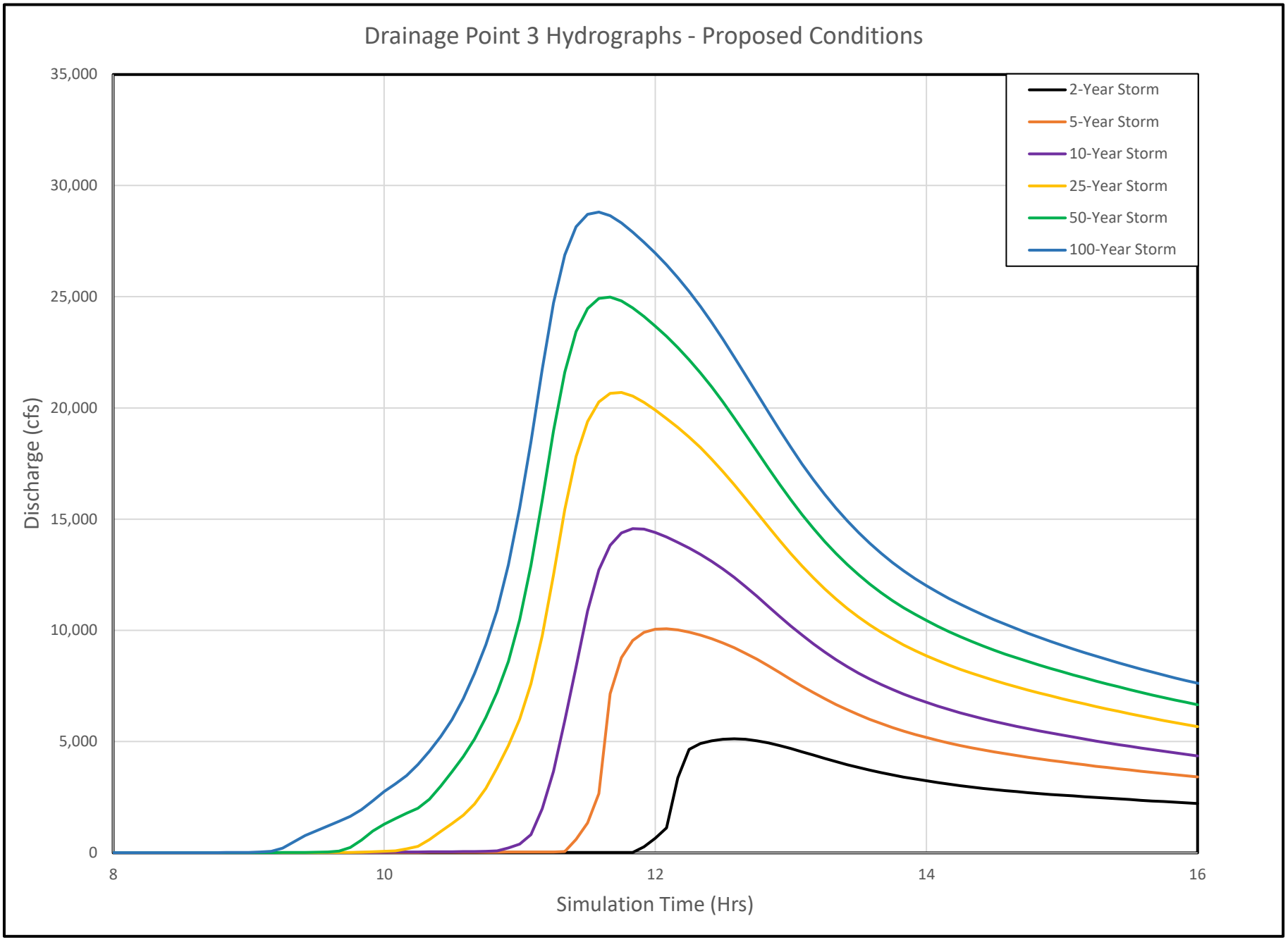

Drainage Point 1 Hydrographs - Existing Conditions
25,000
20,000
15,000
10,000
5,000
0
Discharge (cfs)
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm

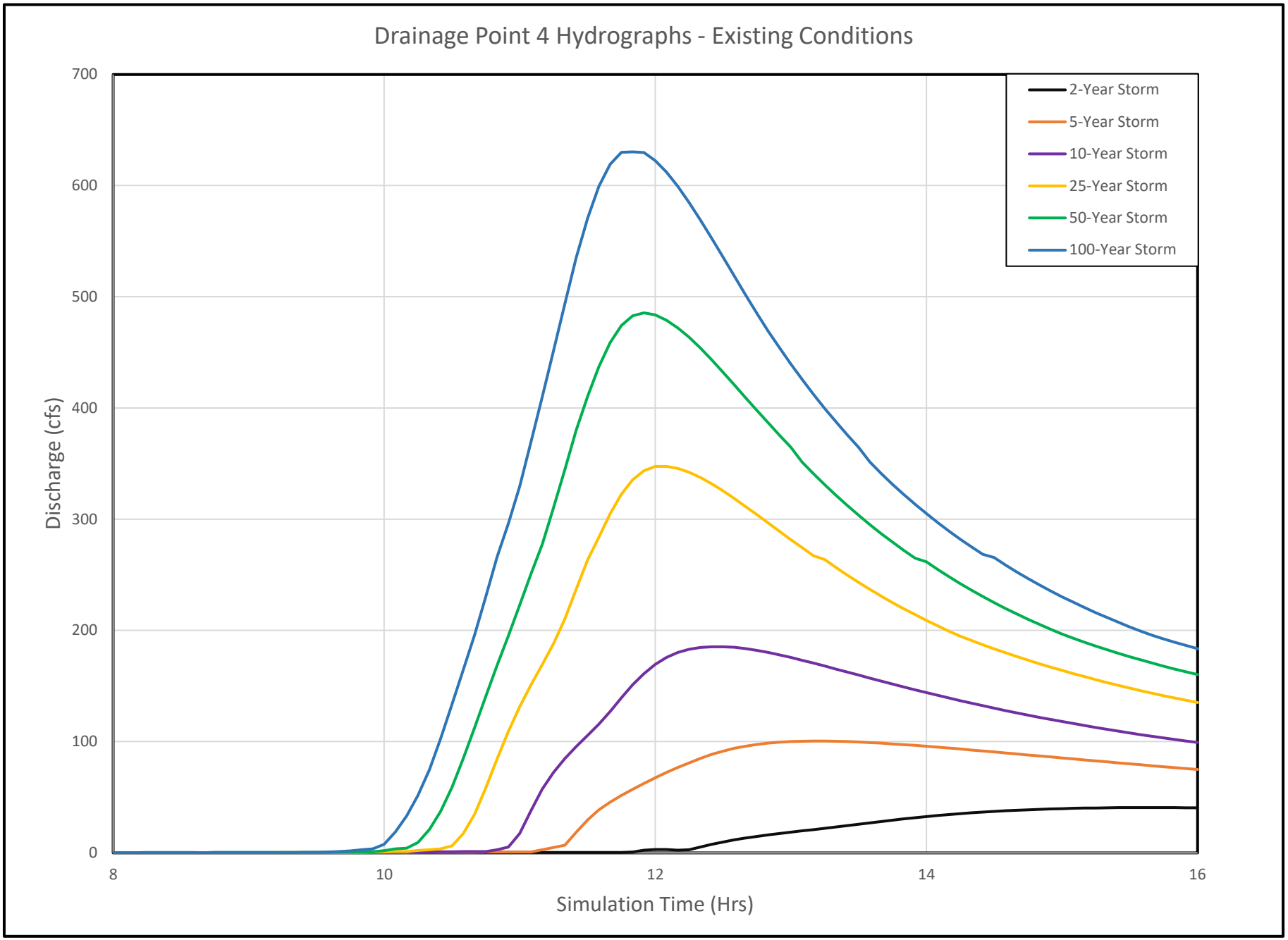

Drainage Point 1 Hydrographs - Proposed Conditions
25,000
20,000
15,000
10,000
5,000
0
Discharge (cfs)
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm

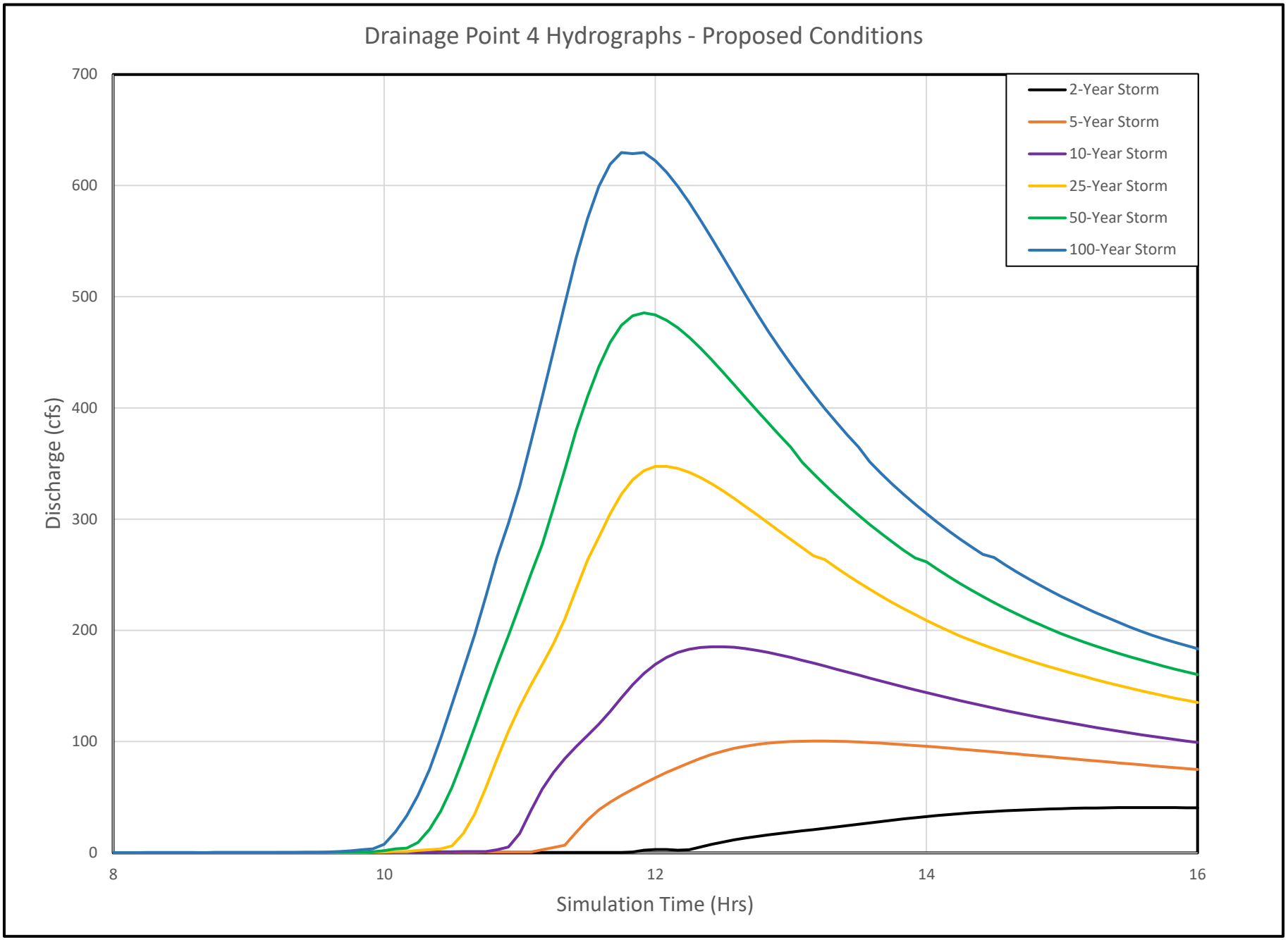

Drainage Point 2 Hydrographs - Existing Conditions
Discharge (cfs)
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm

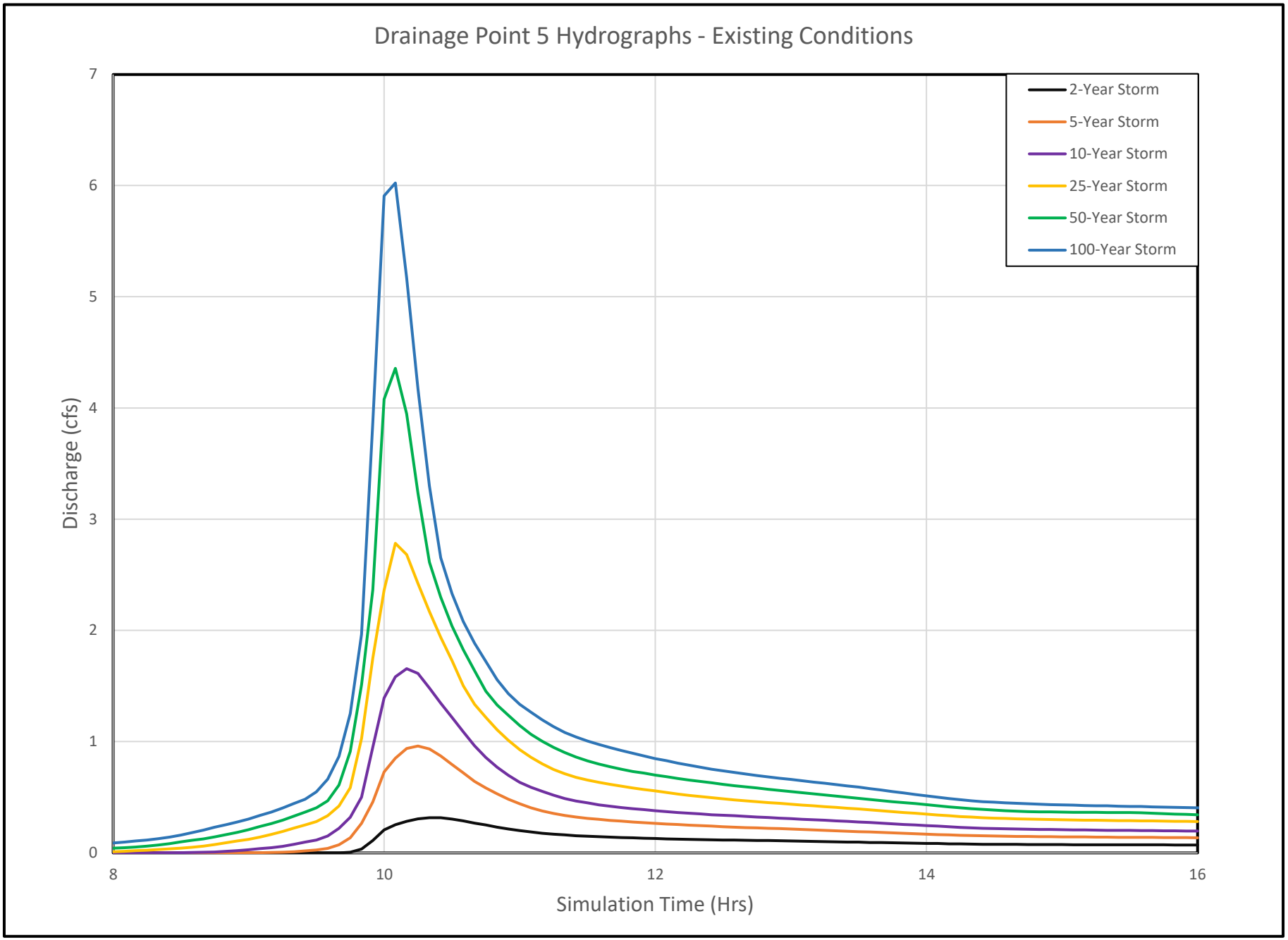

Drainage Point 2 Hydrographs - Proposed Conditions
Discharge (cfs)
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm

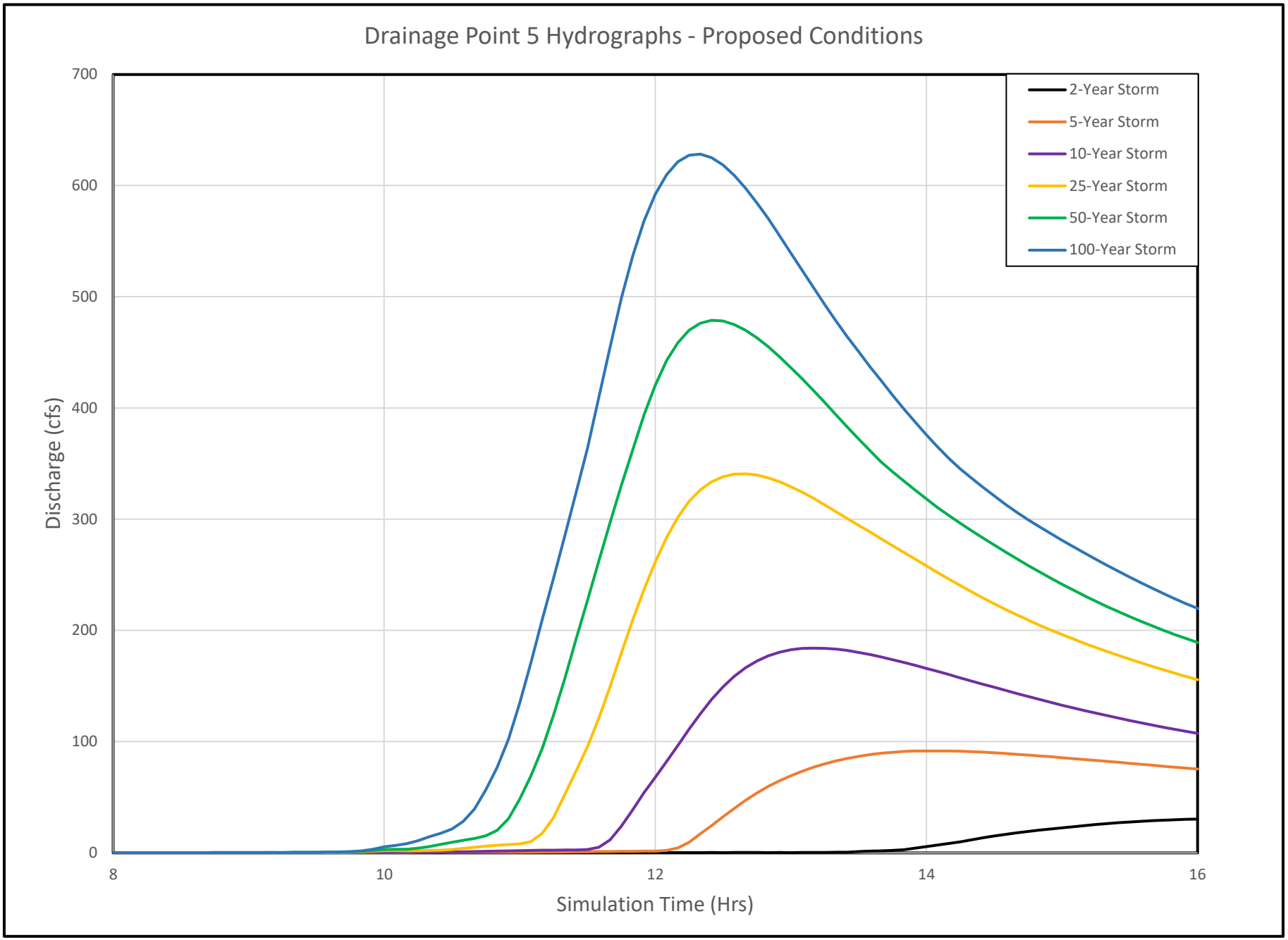

Drainage Point 3 Hydrographs - Existing Conditions
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
Discharge (cfs)
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm

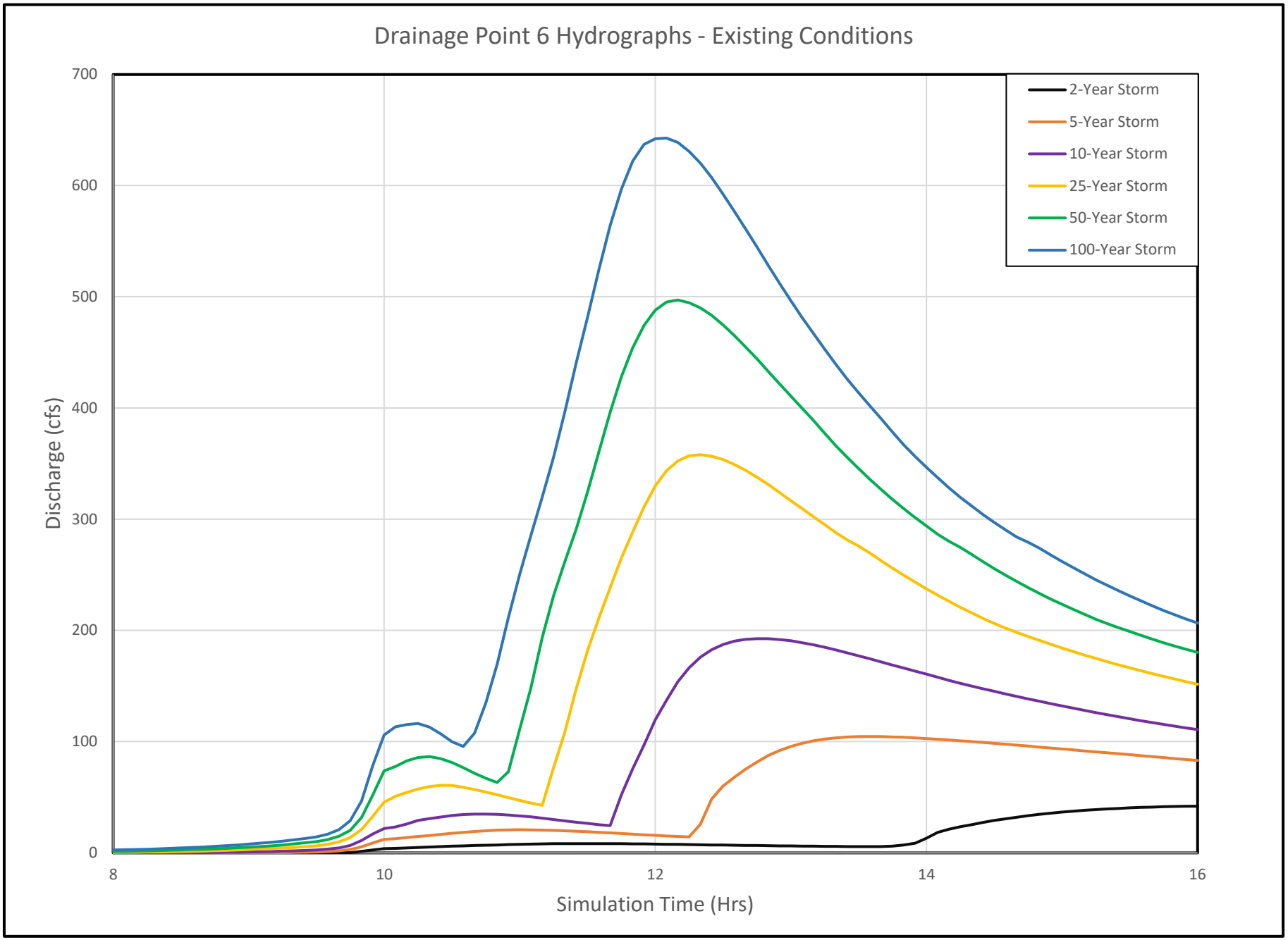

Drainage Point 3 Hydrographs - Proposed Conditions
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
Discharge (cfs)
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm

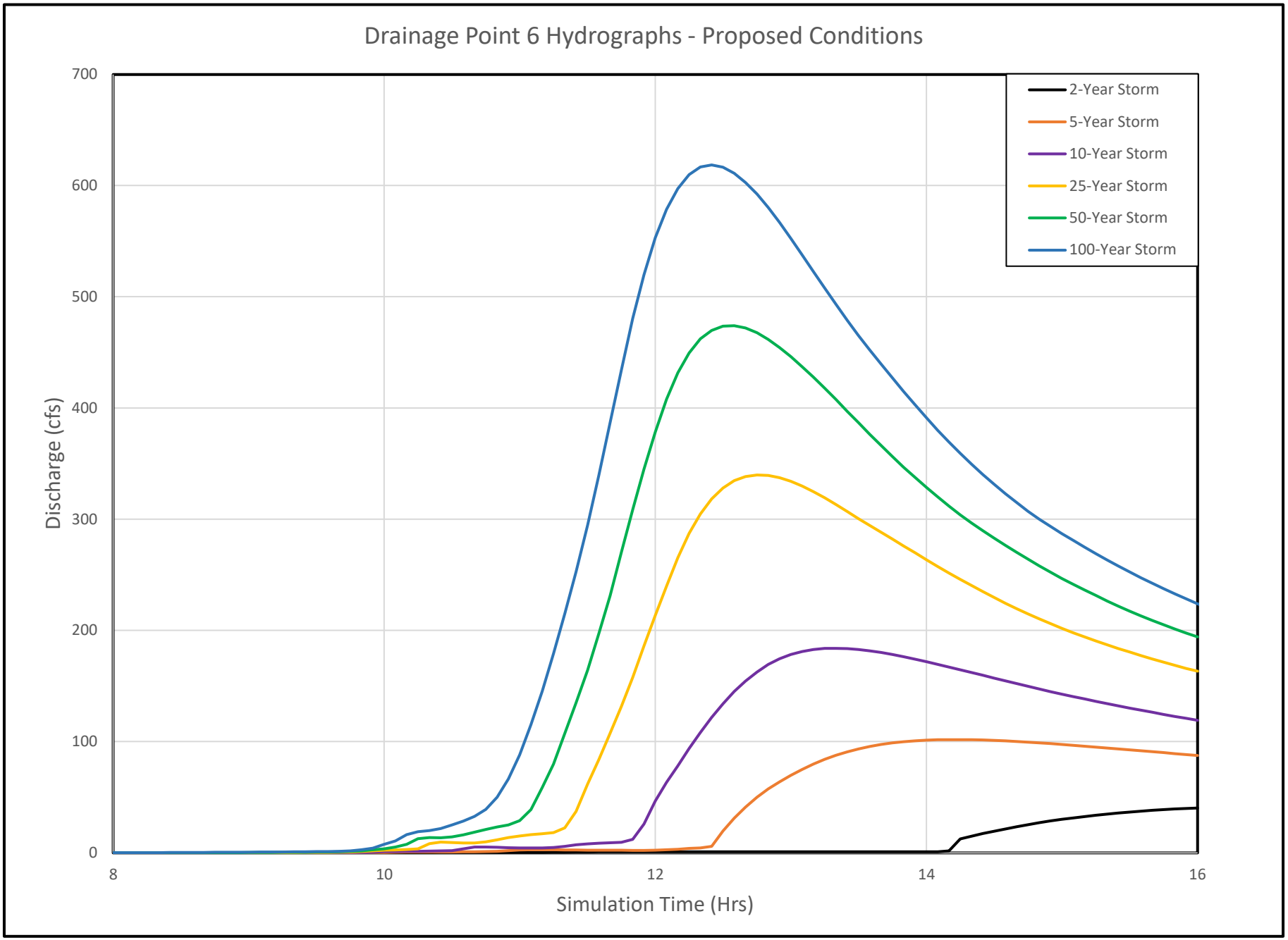

Drainage Point 4 Hydrographs - Existing Conditions
Discharge (cfs)
700
600
500
400
300
200
100
0
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm

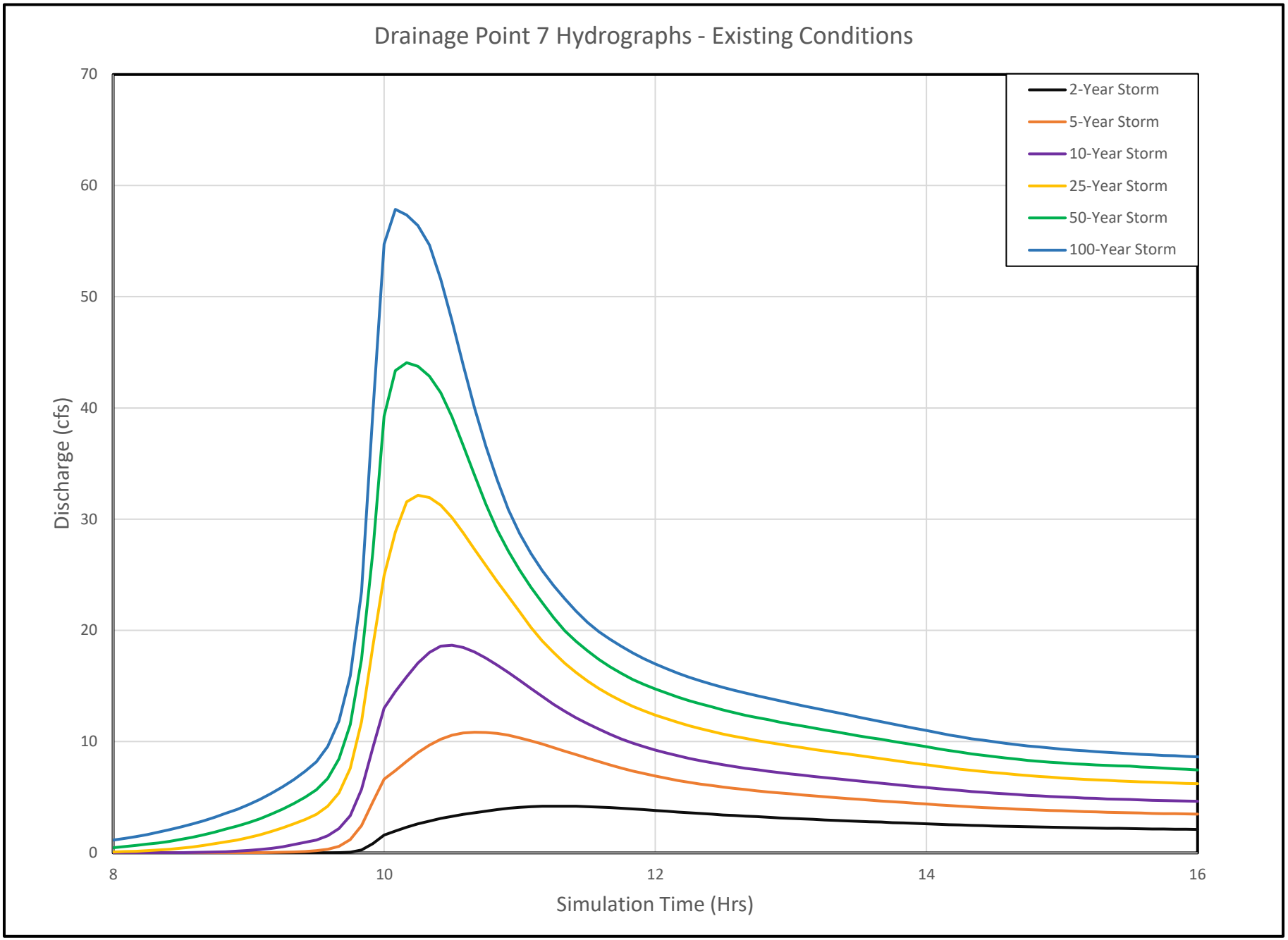

Drainage Point 4 Hydrographs - Proposed Conditions
Discharge (cfs)
700
600
500
400
300
200
100
0
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm

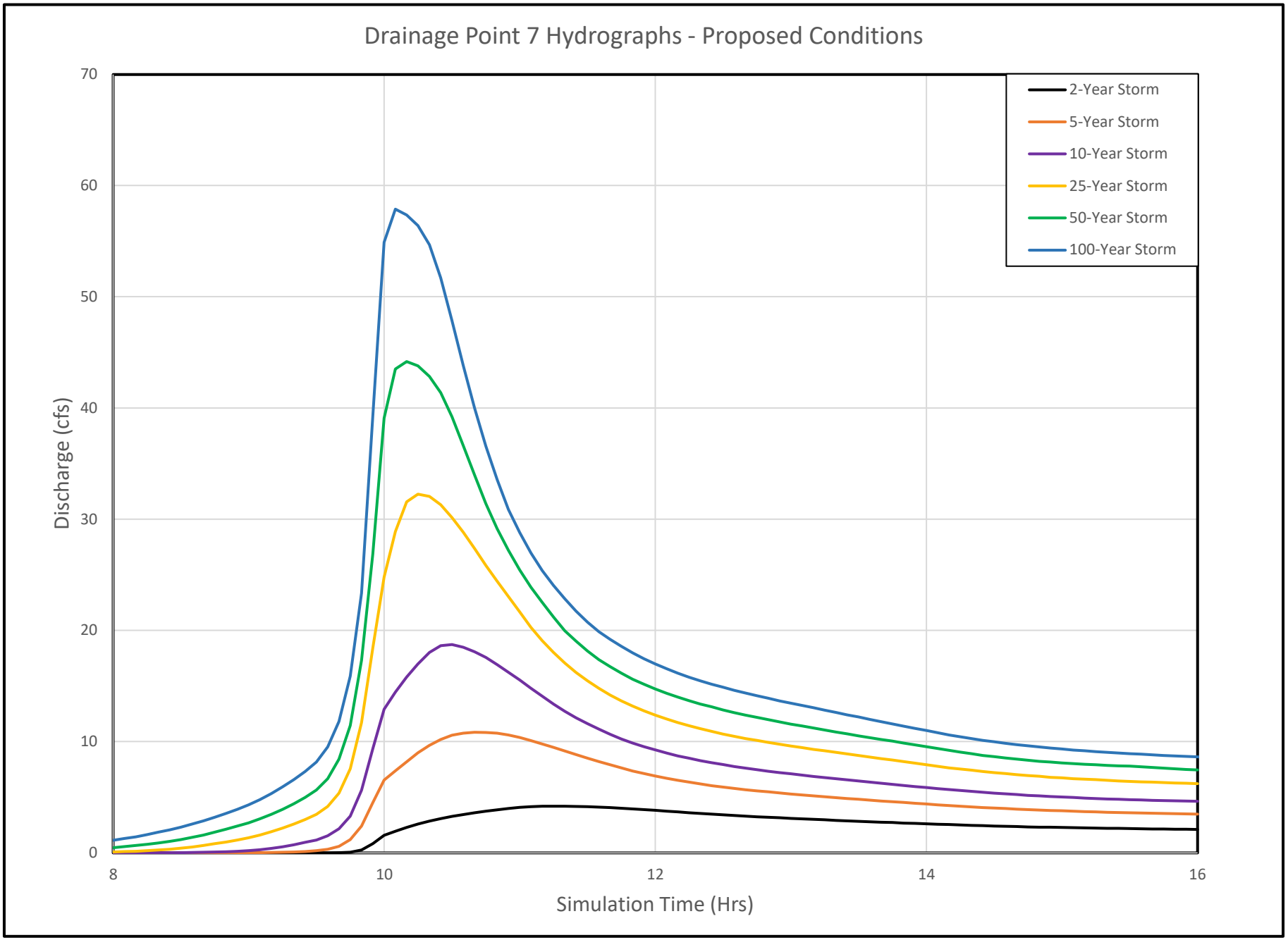

Drainage Point 5 Hydrographs - Existing Conditions
Discharge (cfs)
Simulation Time (Hrs)
0
1
2
3
4
5
6
7
8
10
12
14
16
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm

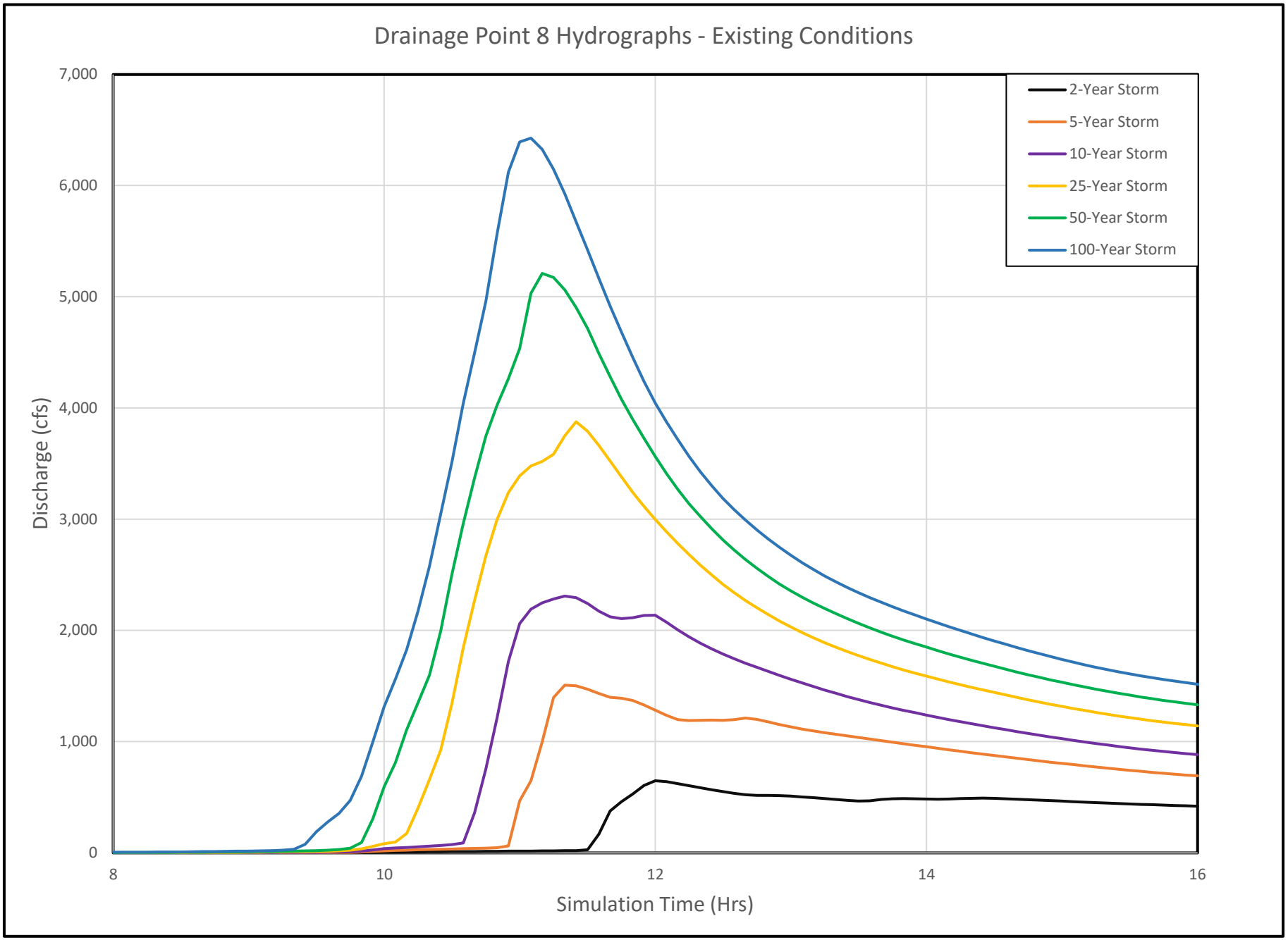

Drainage Point 5 Hydrographs - Proposed Conditions
Discharge (cfs)
700
600
500
400
300
200
100
0
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm

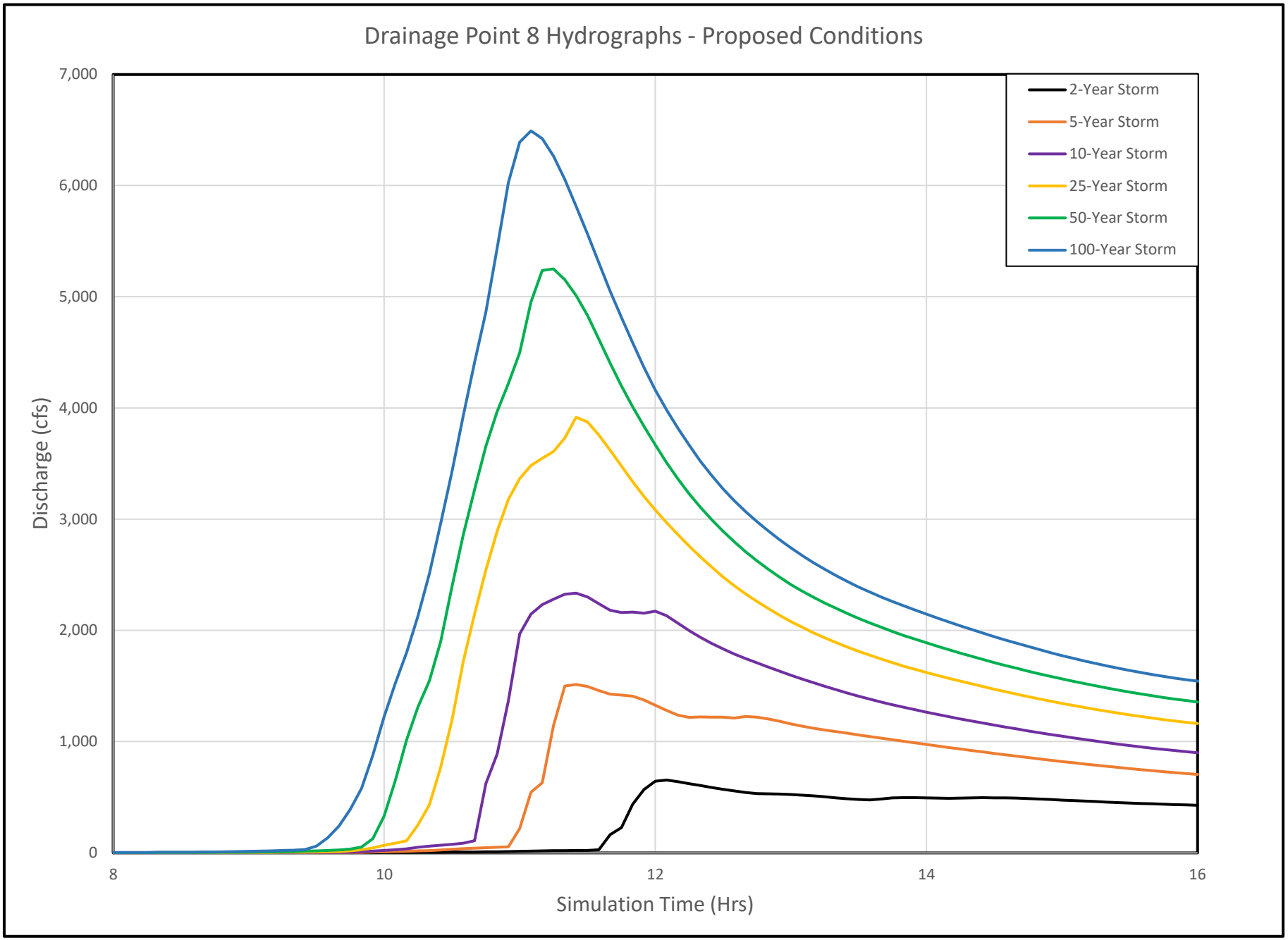

Drainage Point 6 Hydrographs - Existing Conditions
Discharge (cfs)
700
600
500
400
300
200
100
0
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm

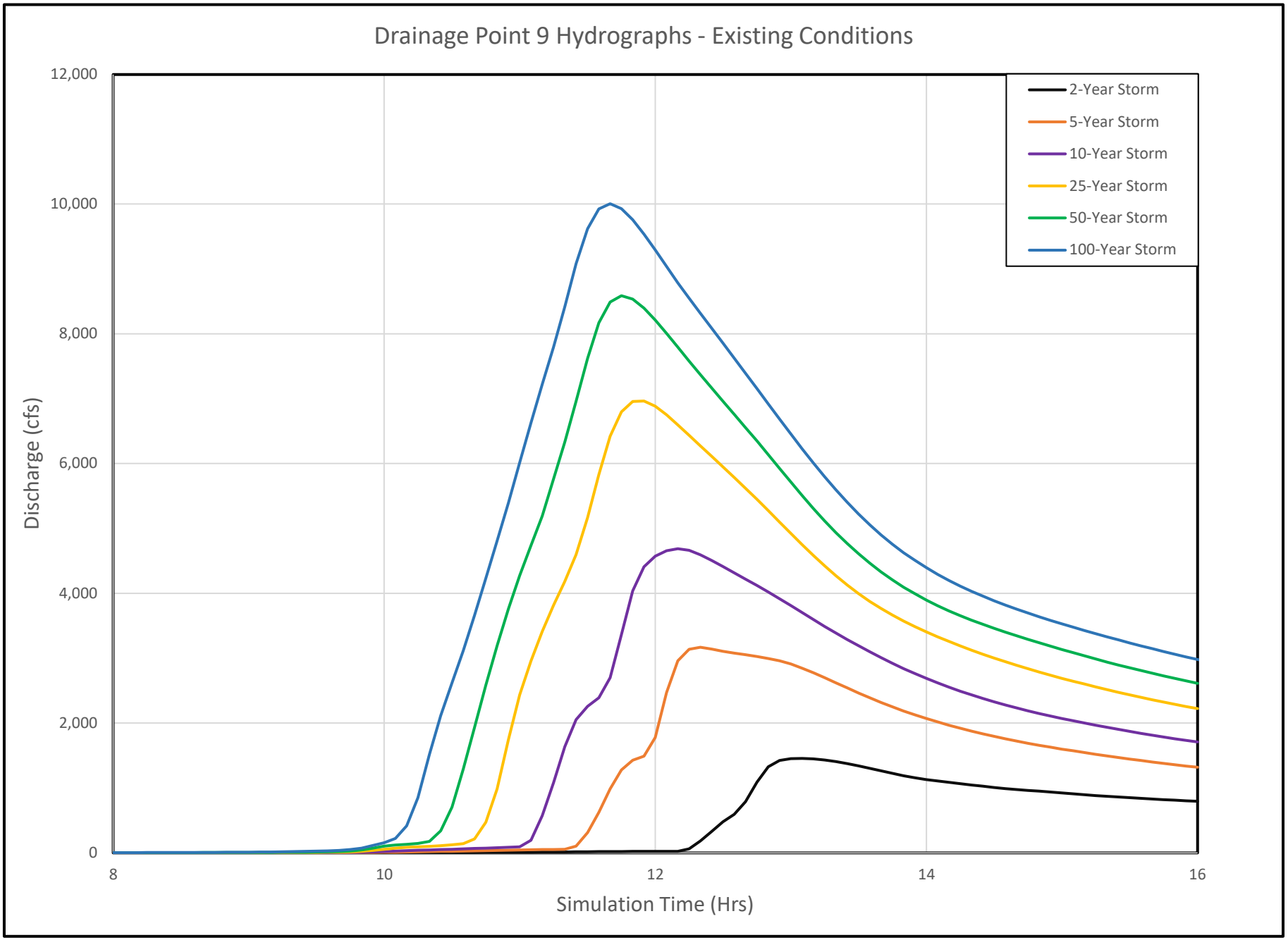

Drainage Point 6 Hydrographs - Proposed Conditions
Discharge (cfs)
700
600
500
400
300
200
100
0
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm

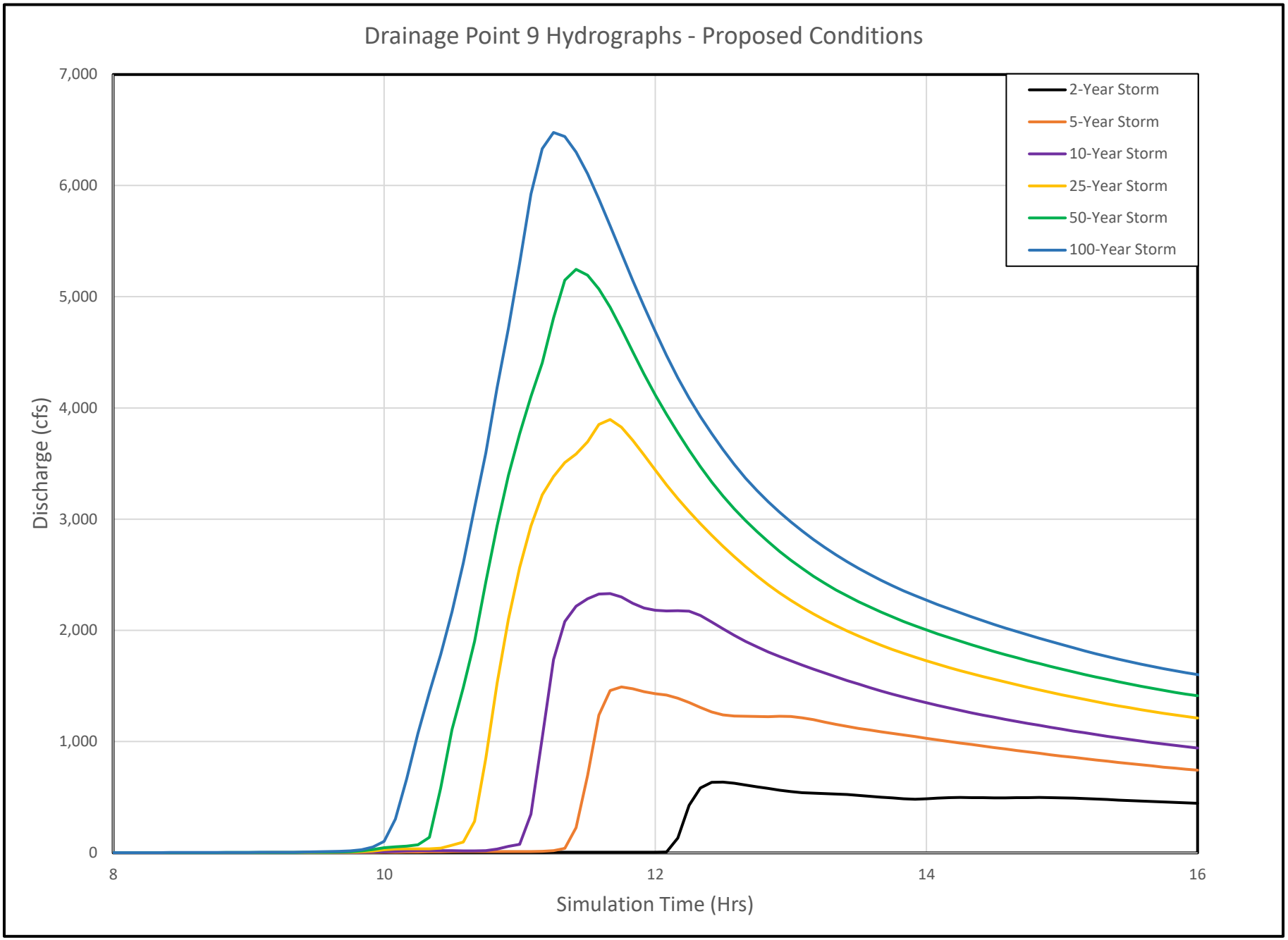

Drainage Point 7 Hydrographs - Existing Conditions
Discharge (cfs)
Simulation Time (Hrs)
0
10
20
30
40
50
60
70
8
10
12
14
16
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm

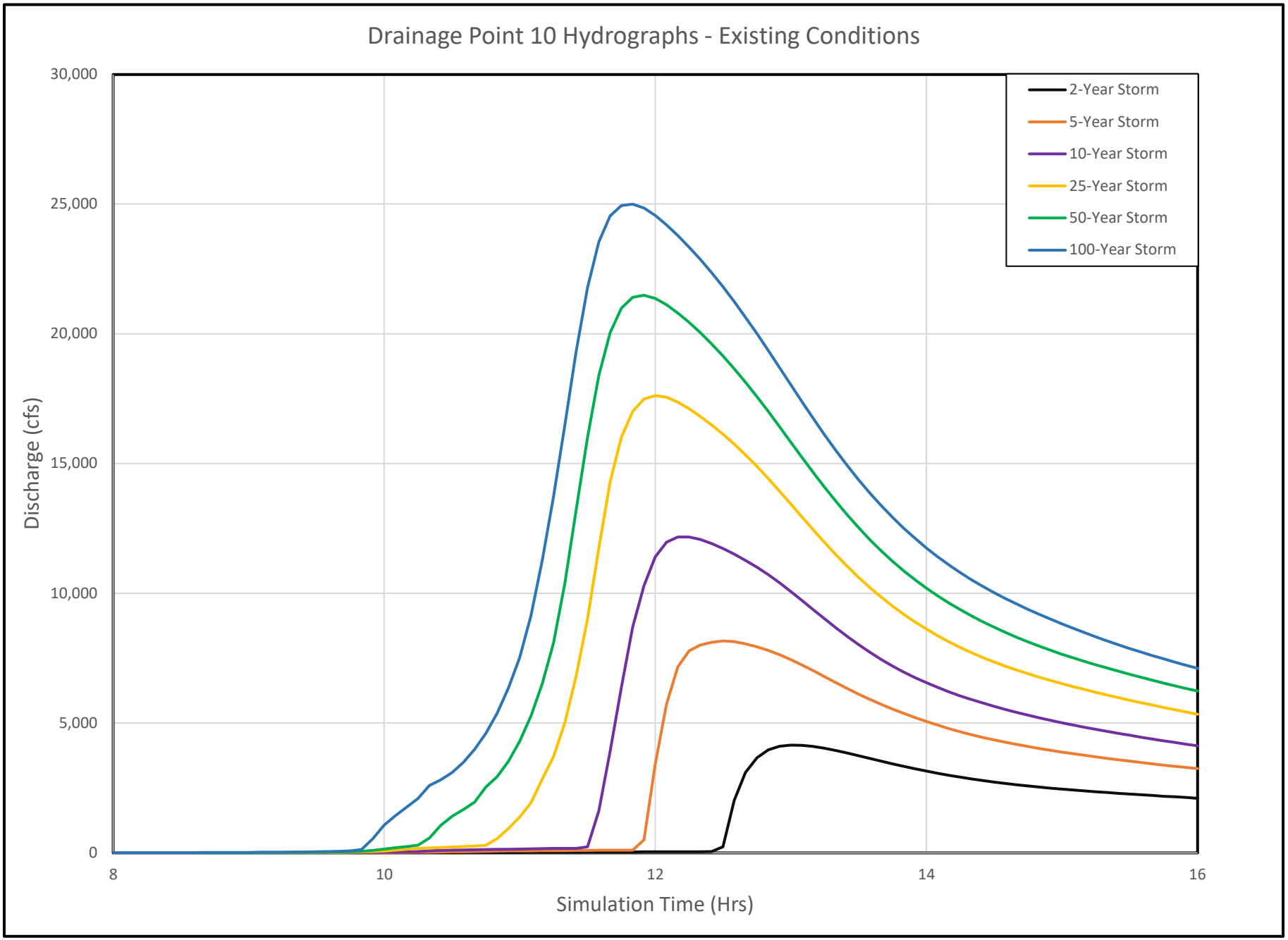

Drainage Point 7 Hydrographs - Proposed Conditions
Discharge (cfs)
Simulation Time (Hrs)
0
10
20
30
40
50
60
70
8
10
12
14
16
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm

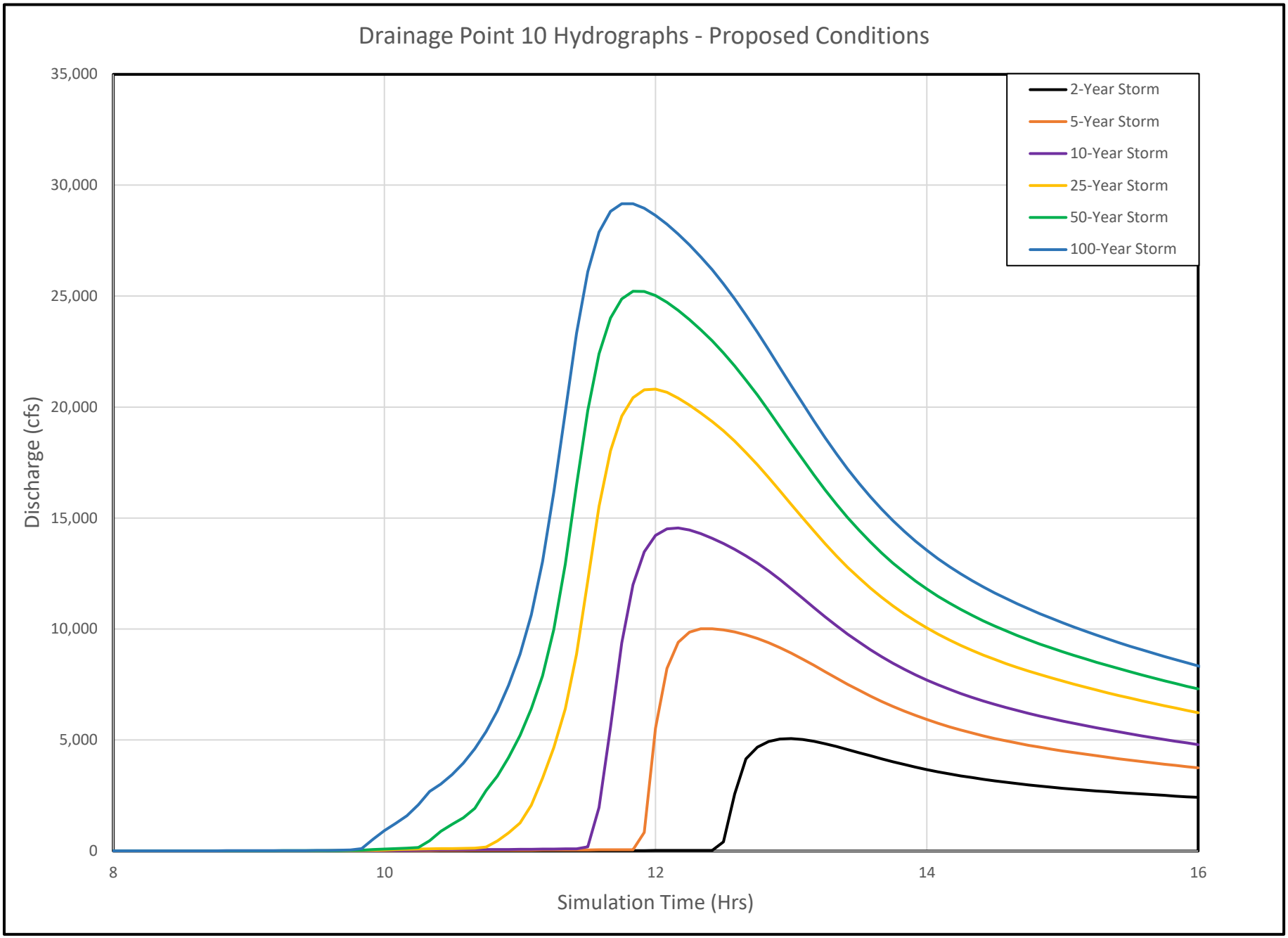

Drainage Point 8 Hydrographs - Existing Conditions
Discharge (cfs)
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm


Drainage Point 8 Hydrographs - Proposed Conditions
Discharge (cfs)
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm


Drainage Point 9 Hydrographs - Existing Conditions
Discharge (cfs)
12,000
10,000
8,000
6,000
4,000
2,000
0
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm


Drainage Point 9 Hydrographs - Proposed Conditions
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
Discharge (cfs)
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm


Drainage Point 10 Hydrographs - Existing Conditions
30,000
25,000
20,000
15,000
10,000
5,000
0
Discharge (cfs)
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm


Drainage Point 10 Hydrographs - Proposed Conditions
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
Discharge (cfs)
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm

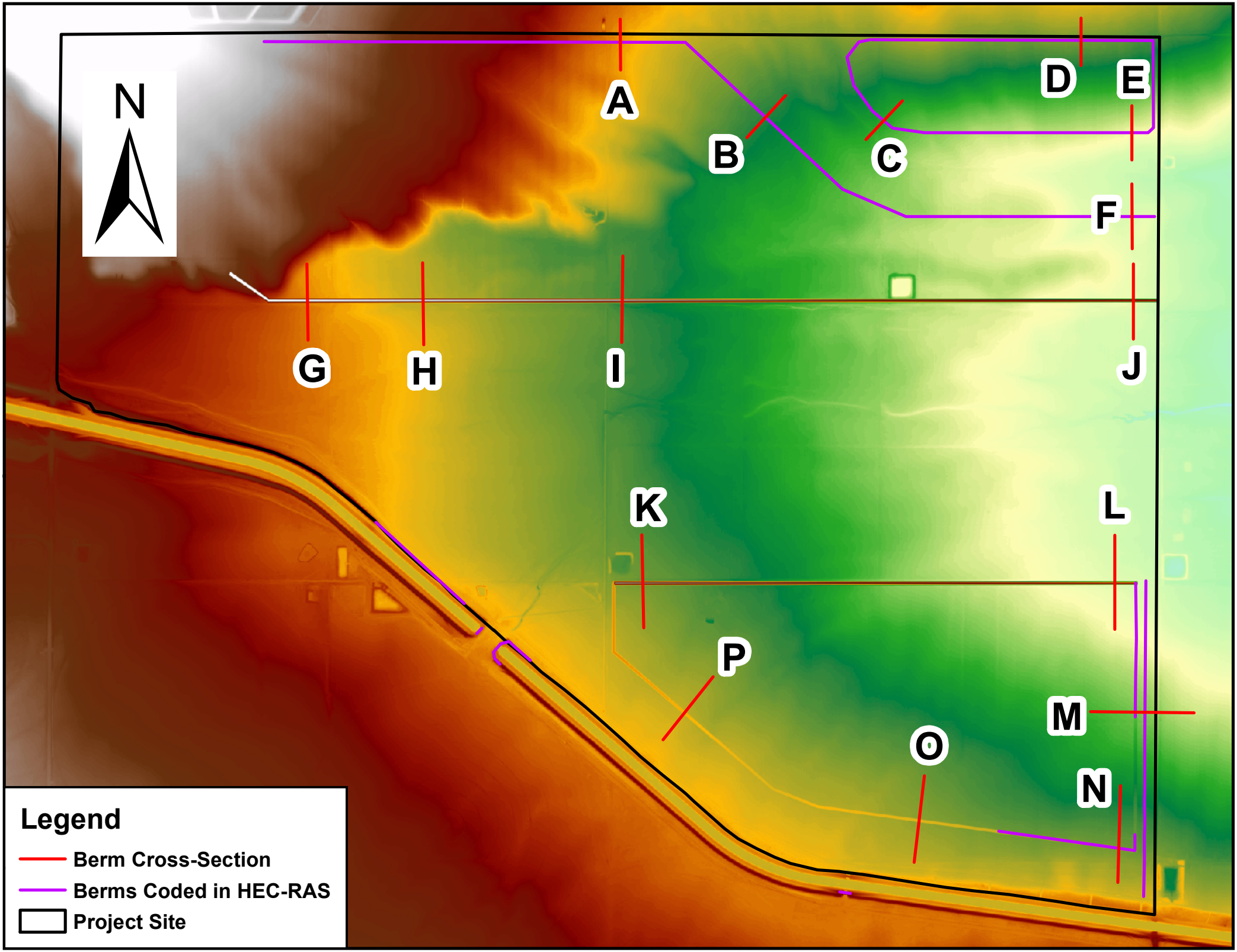
APPENDIX E

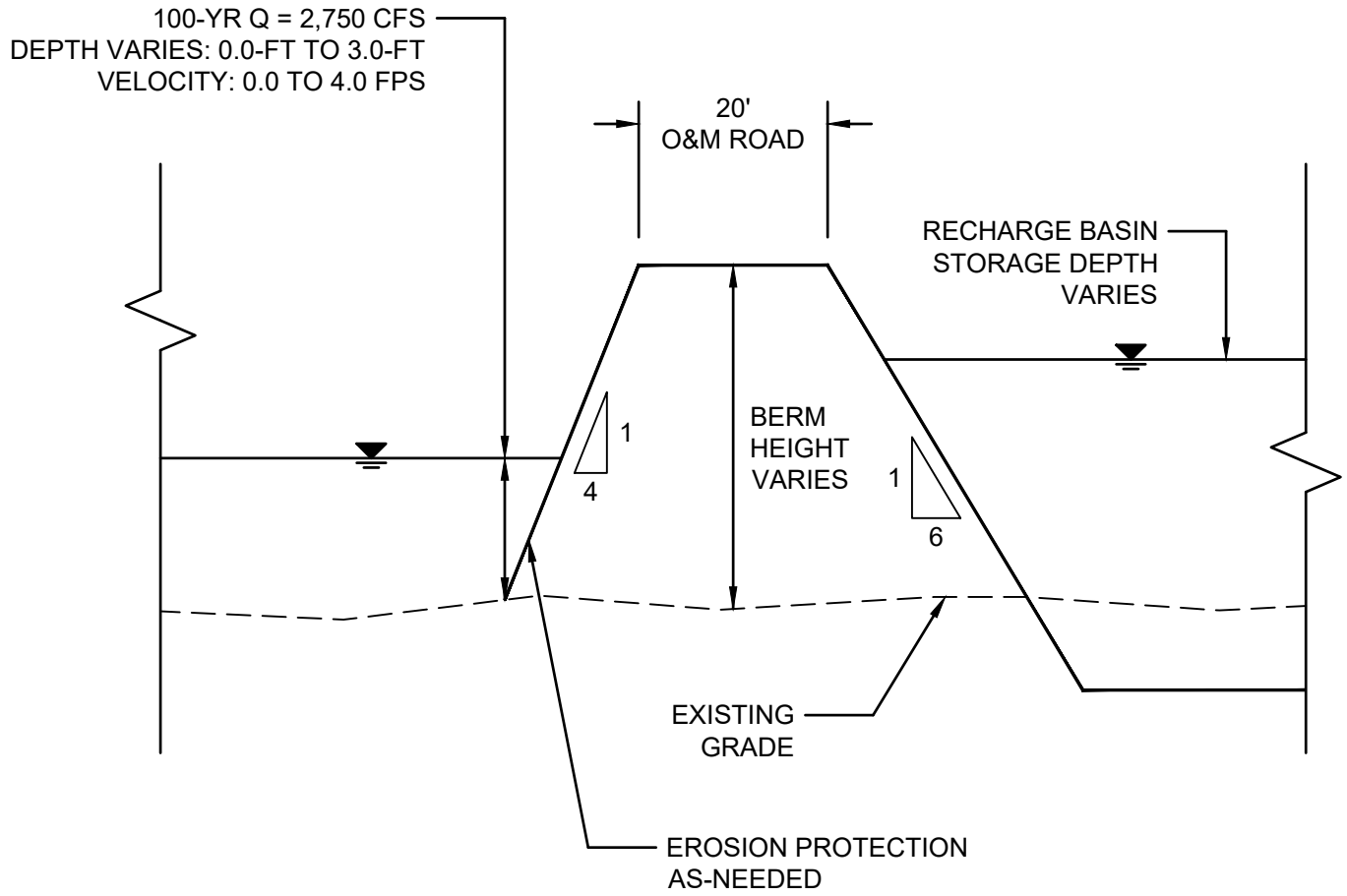
Digital Data

(Provided Digitally Only)

APPENDIX F

Preliminary Drainage Improvements


N
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Legend
Berm Cross-Section
Berms Coded in HEC-RAS
Project Site



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

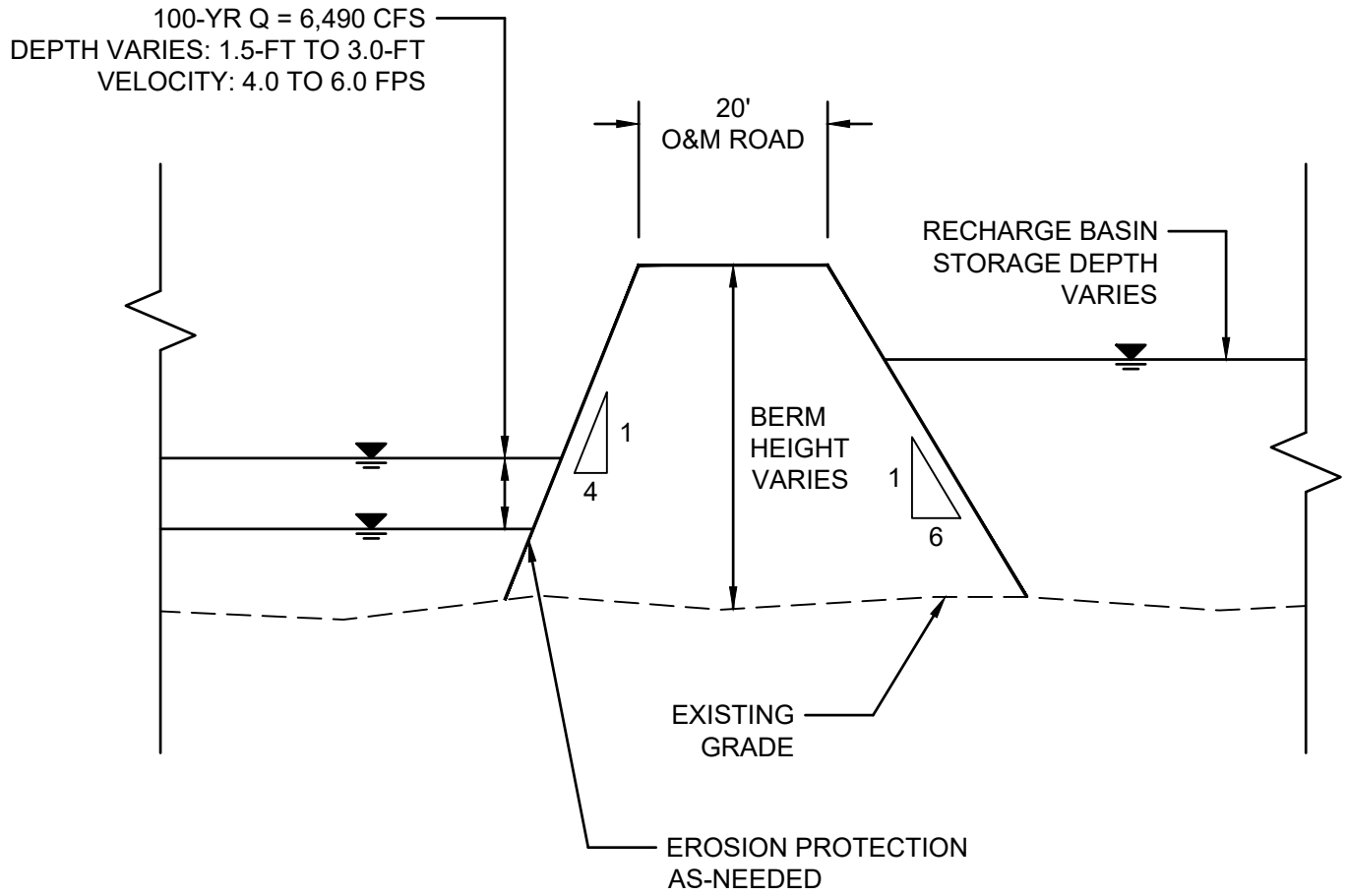
0 10 20 40 FT

VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS
SECTION 'A'



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

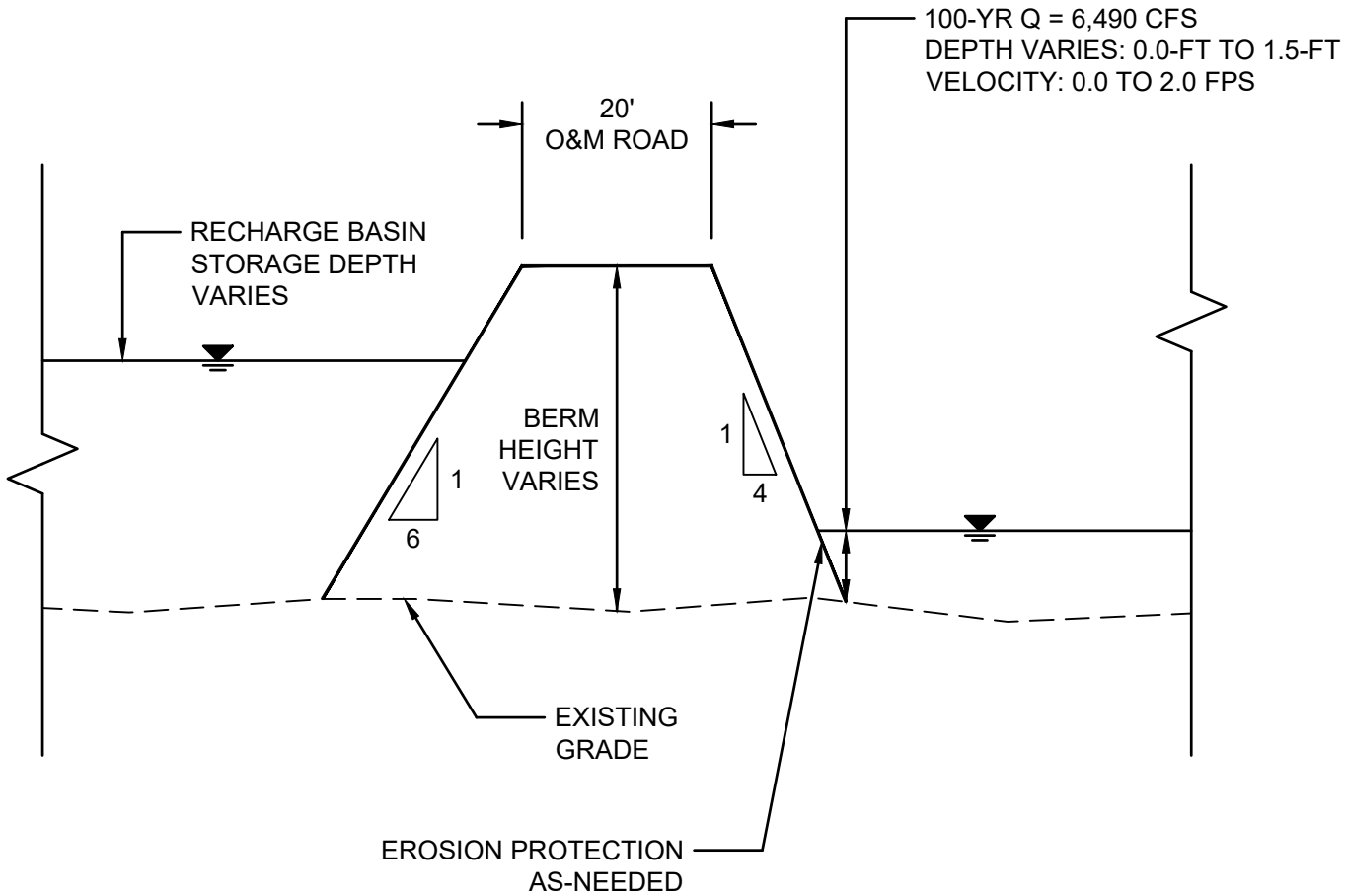
0 10 20 40 FT

VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS SECTION 'B'



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

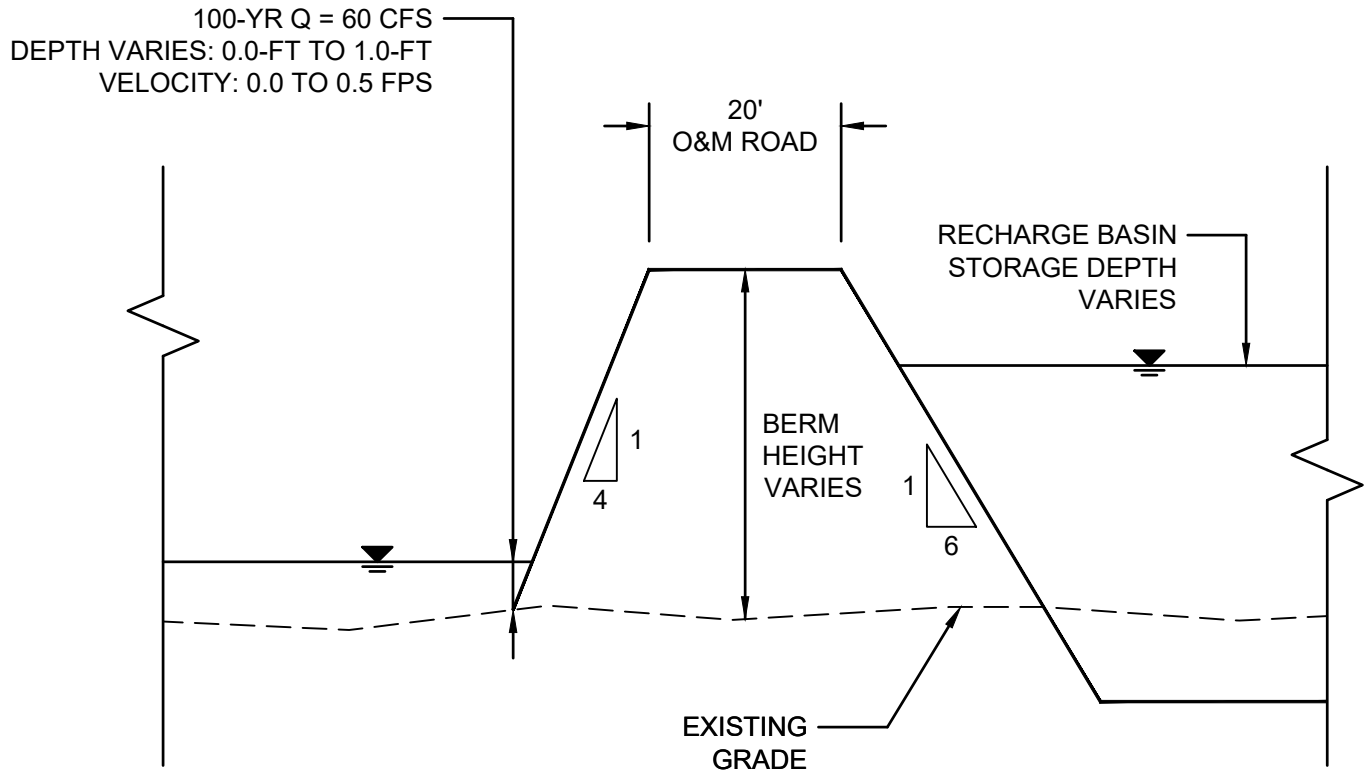
0 10 20 40 FT

VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS
SECTION 'C'



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

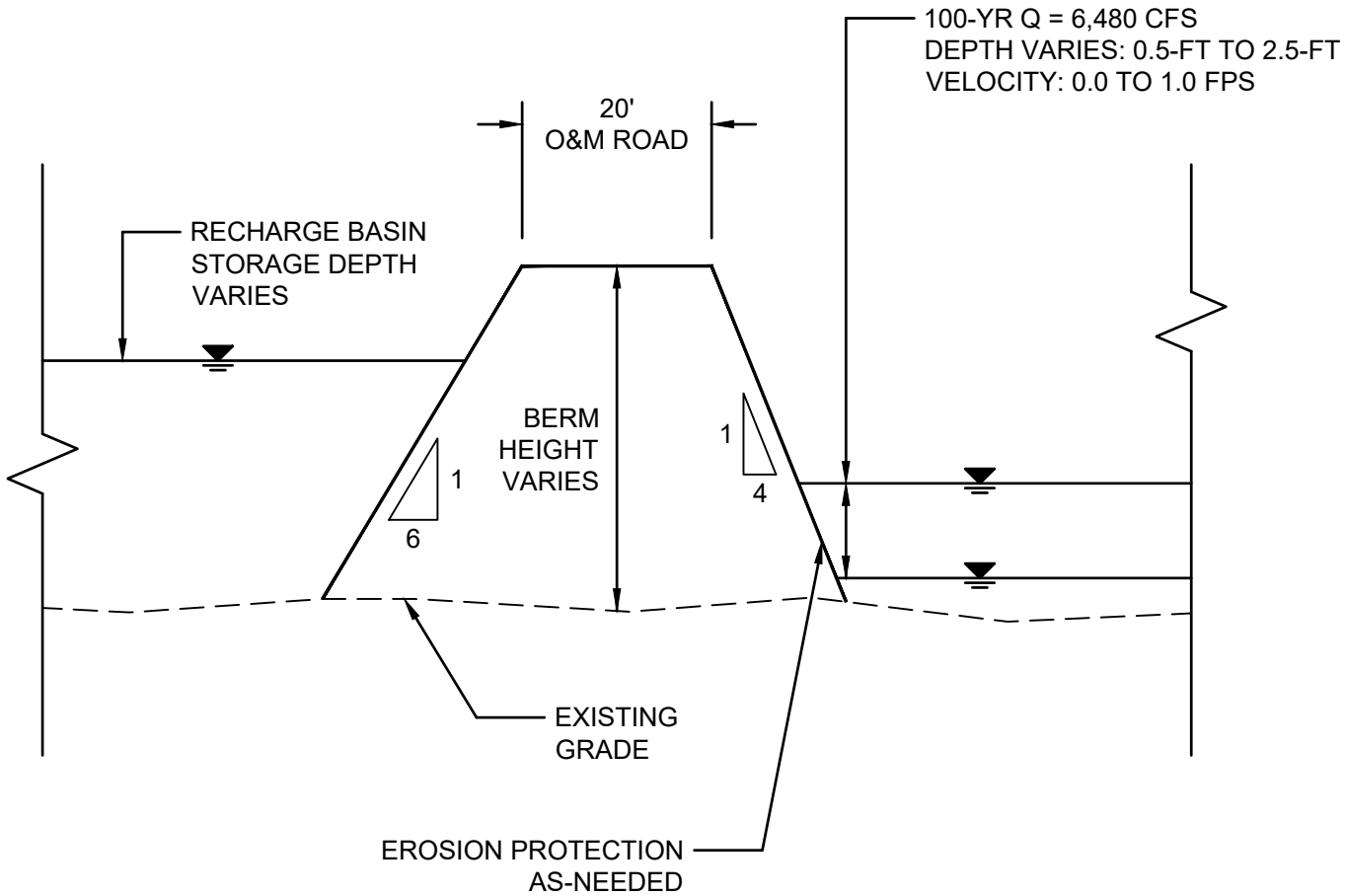
0 10 20 40 FT

VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS
SECTION 'D'



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

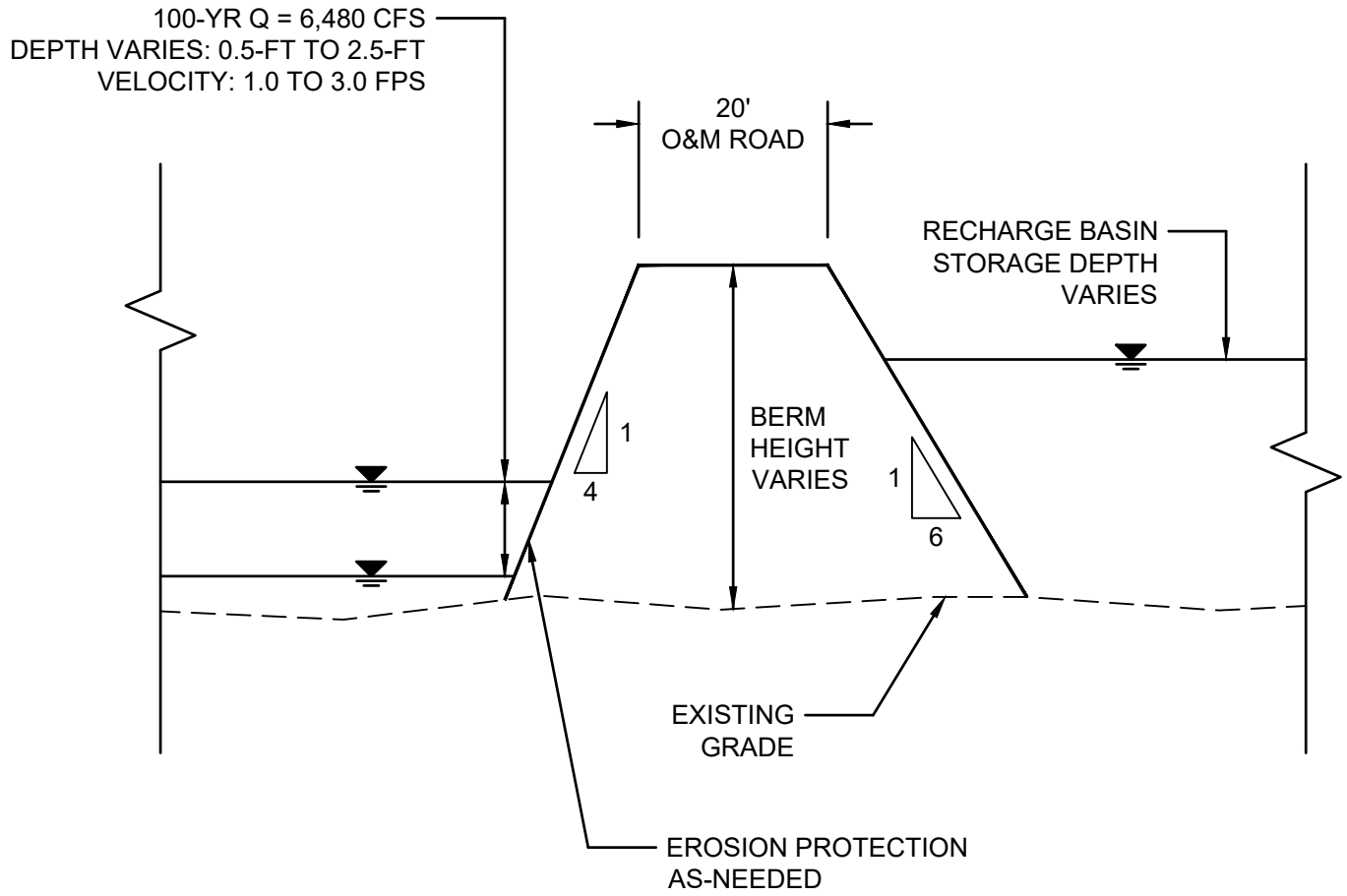
0 10 20 40 FT

VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS
SECTION 'E'



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

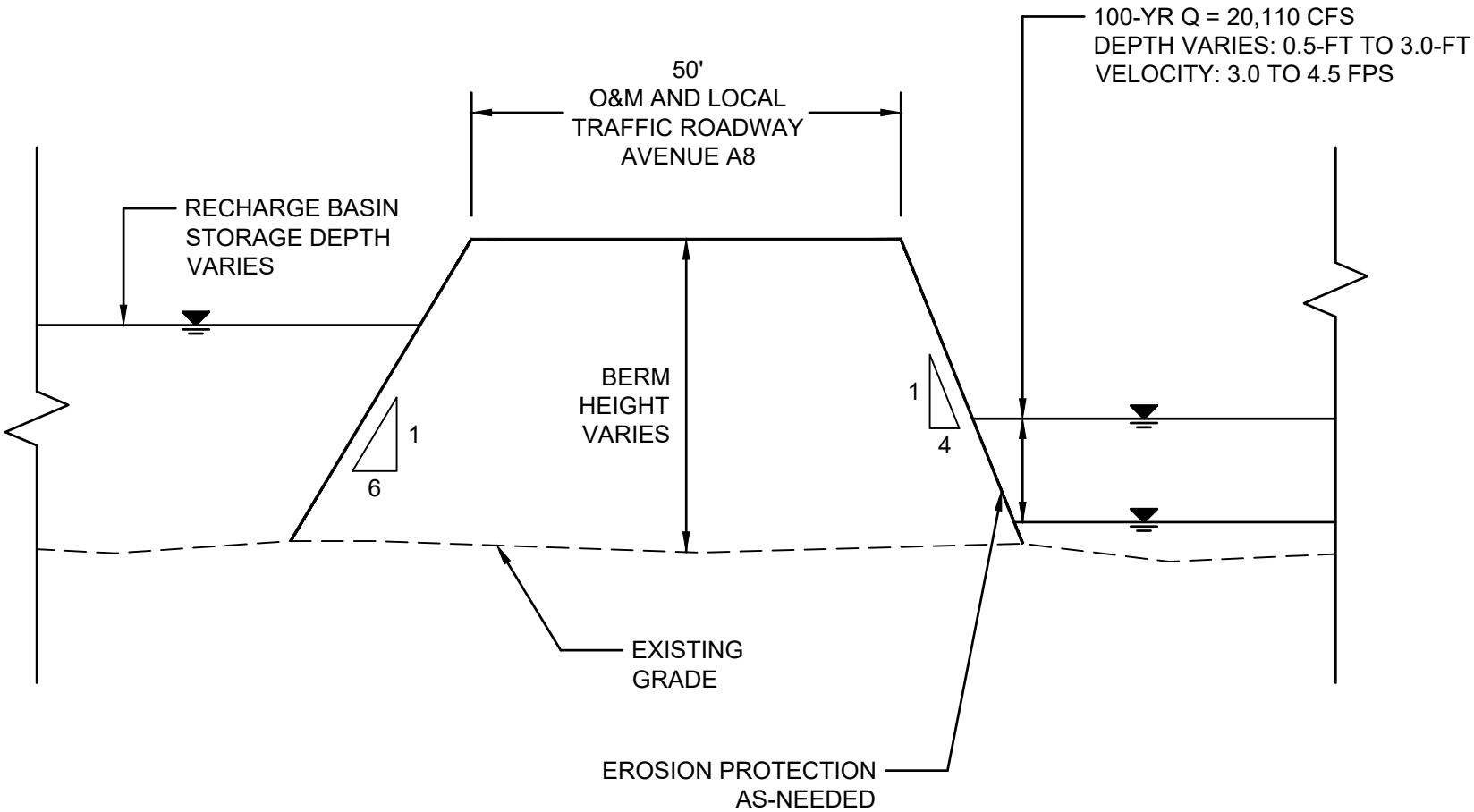
0 10 20 40 FT

VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS
SECTION 'F'



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

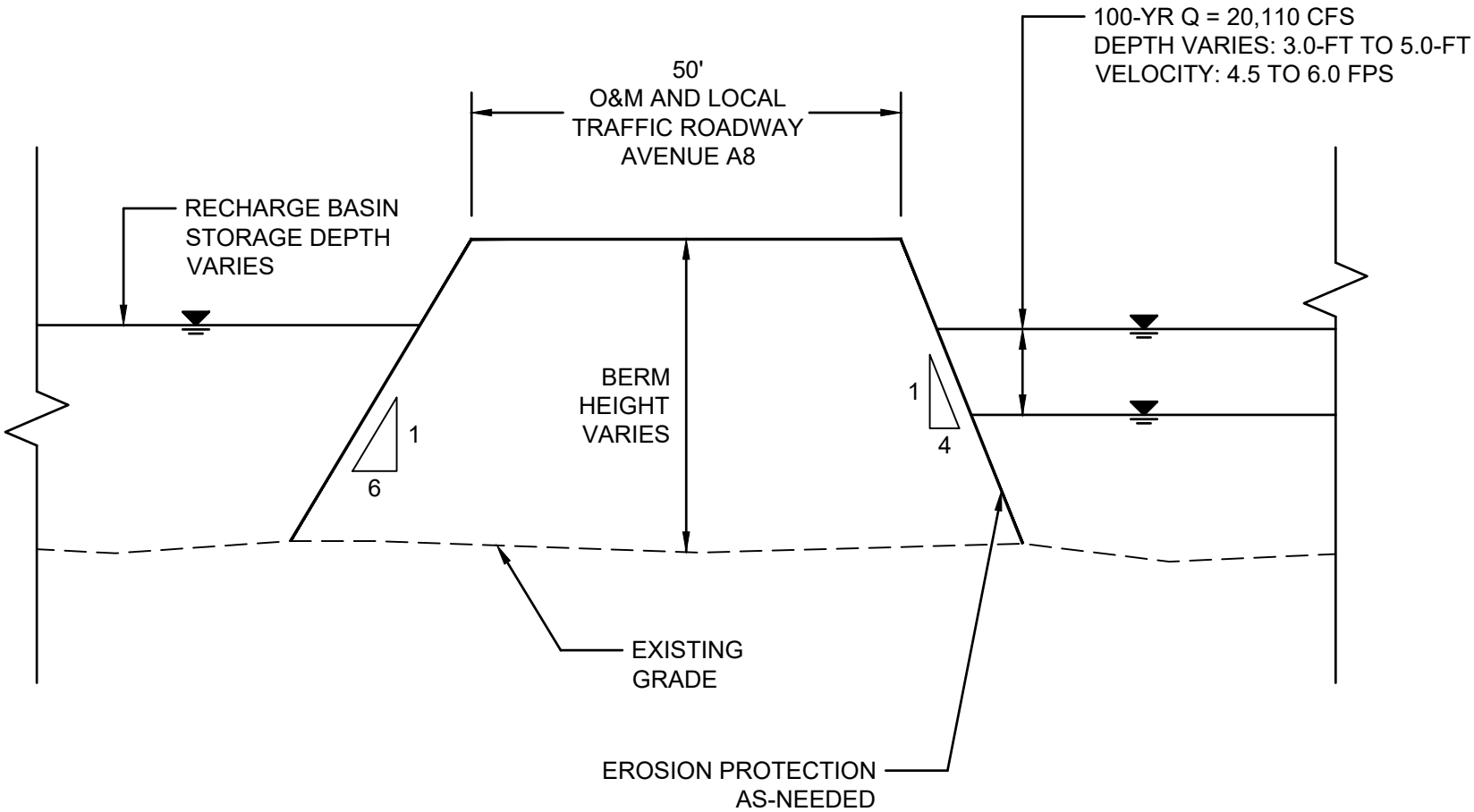
0 10 20 40 FT

VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS
SECTION 'G'



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

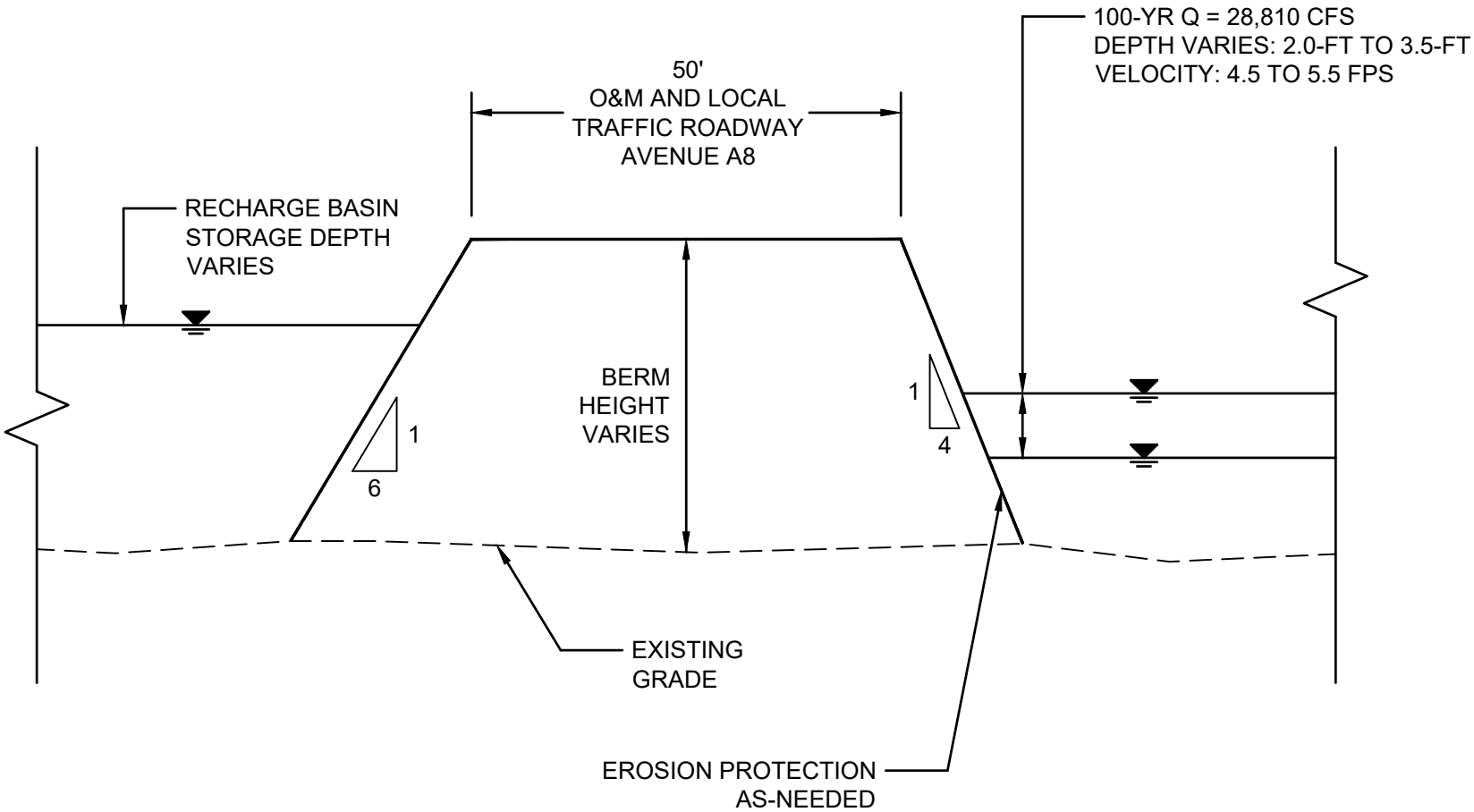
0 10 20 40 FT

VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS
SECTION 'H'



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

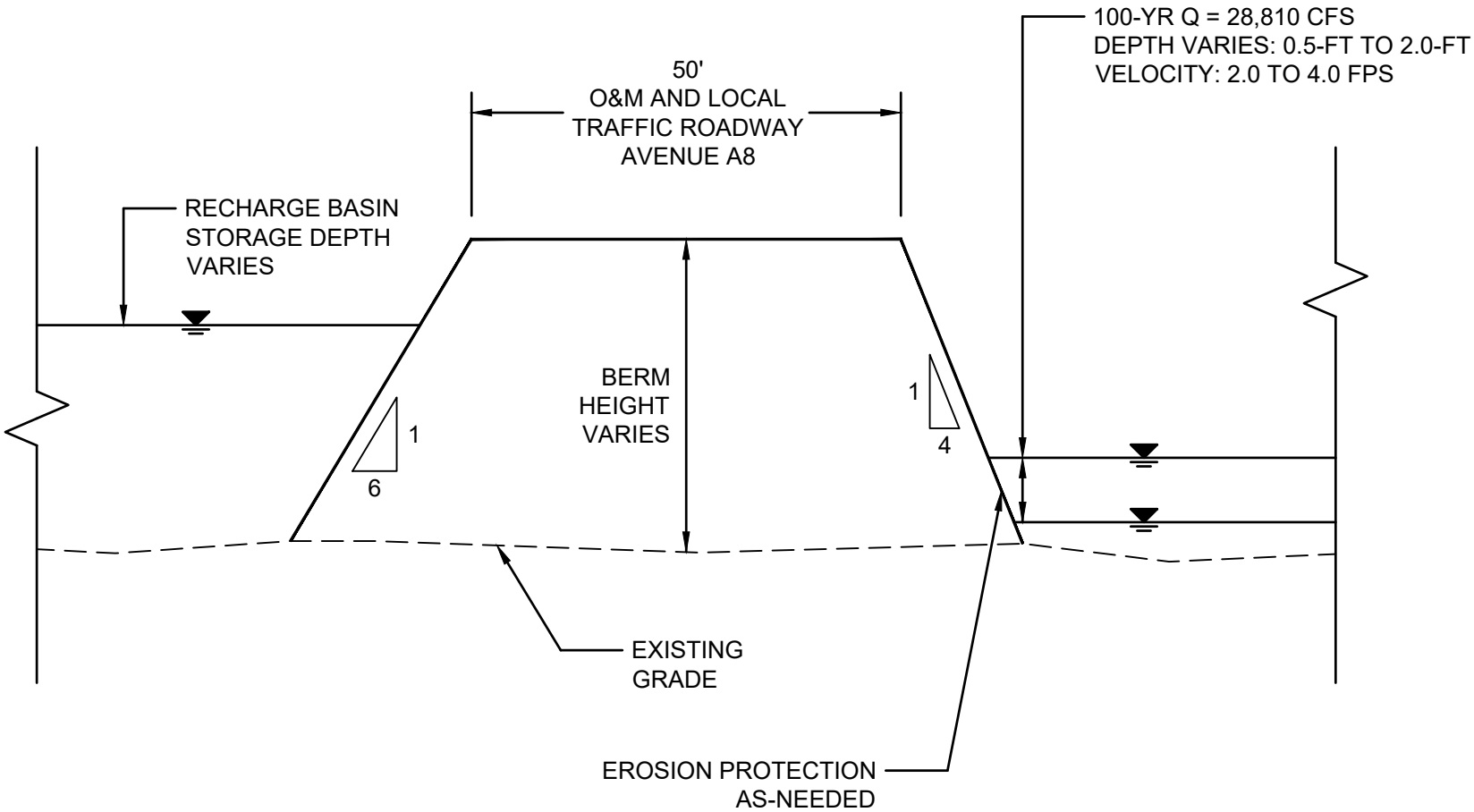
0 10 20 40 FT

VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS
SECTION 'I'



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

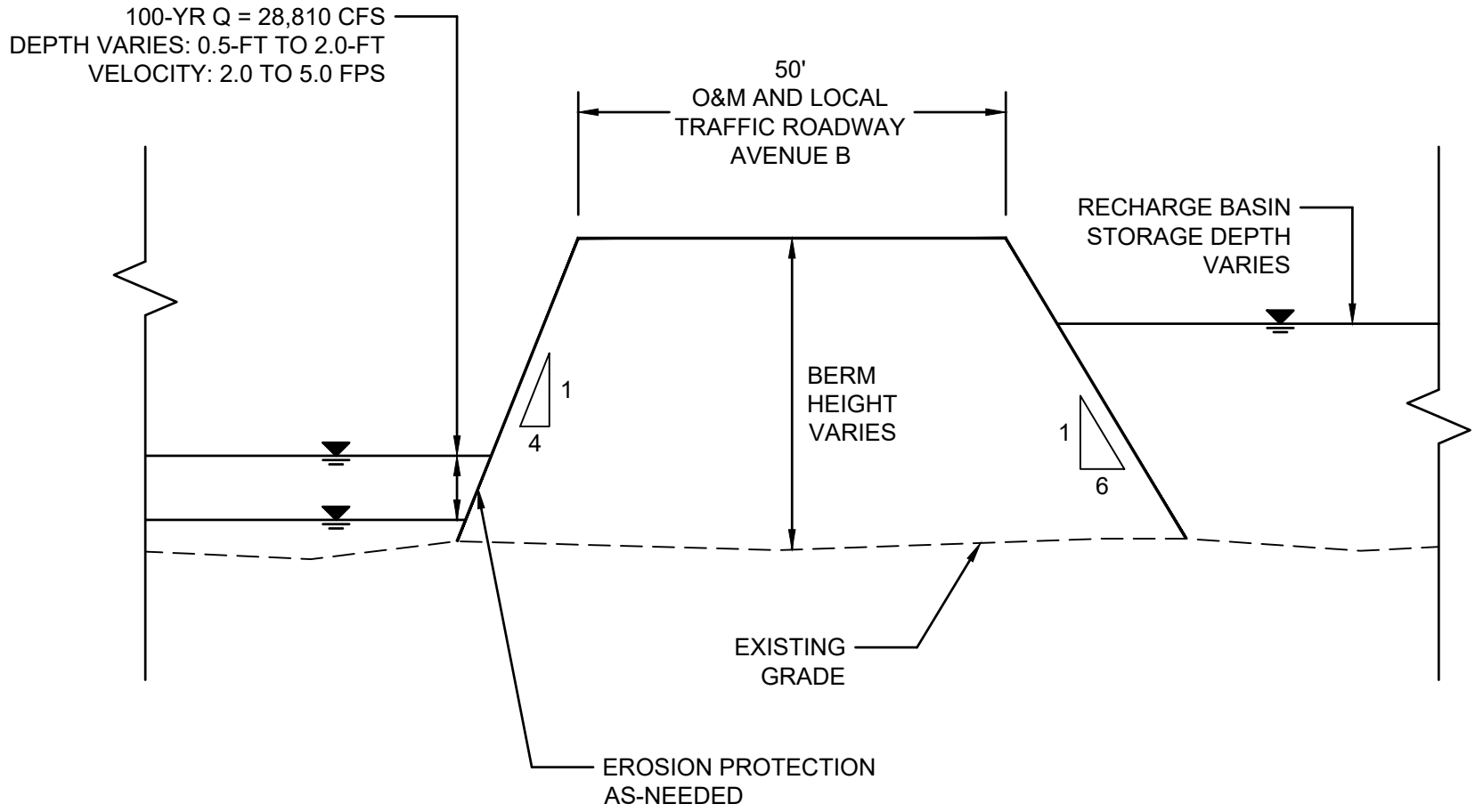
0 10 20 40 FT

VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS
SECTION 'J'



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

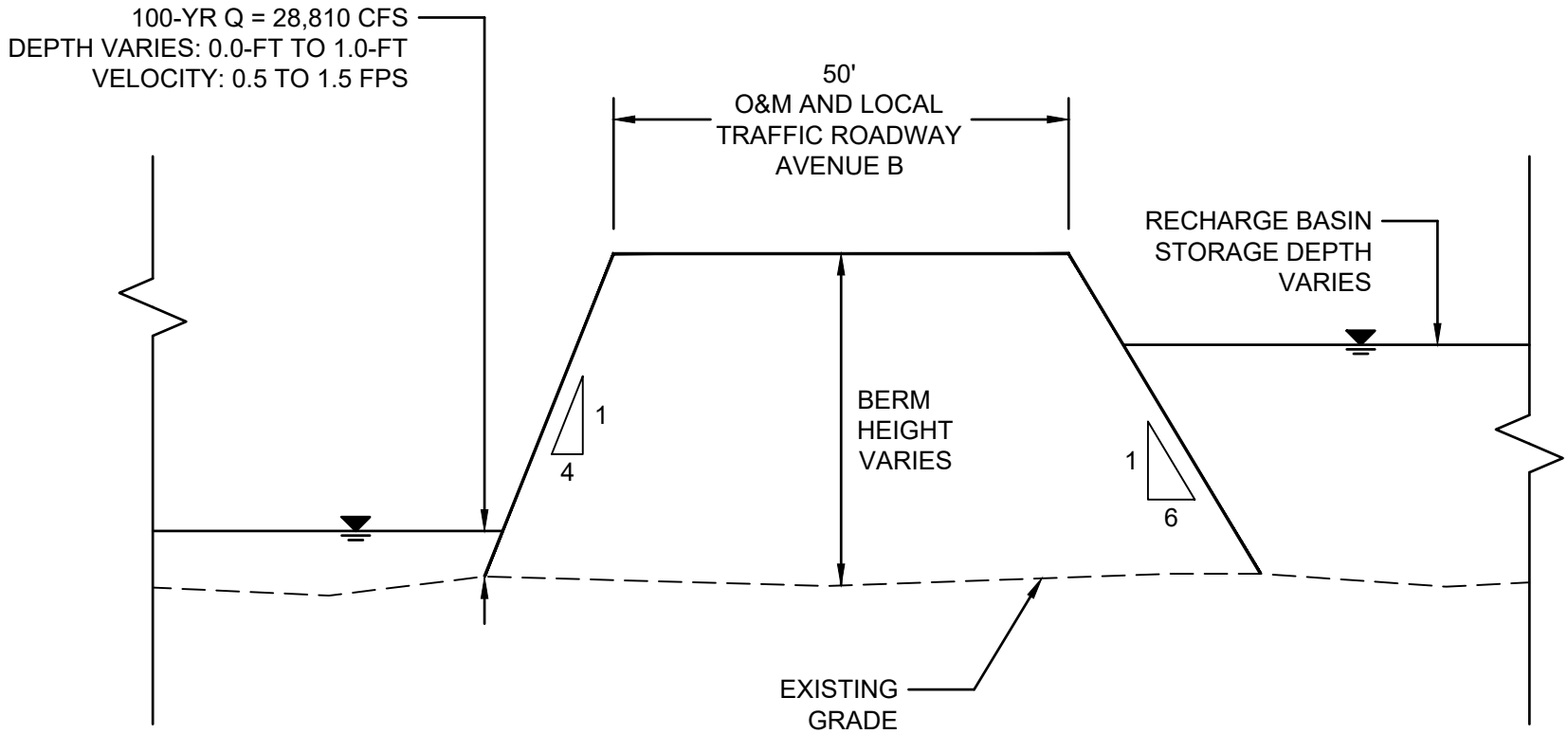
0 10 20 40 FT

VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS
SECTION 'K'



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

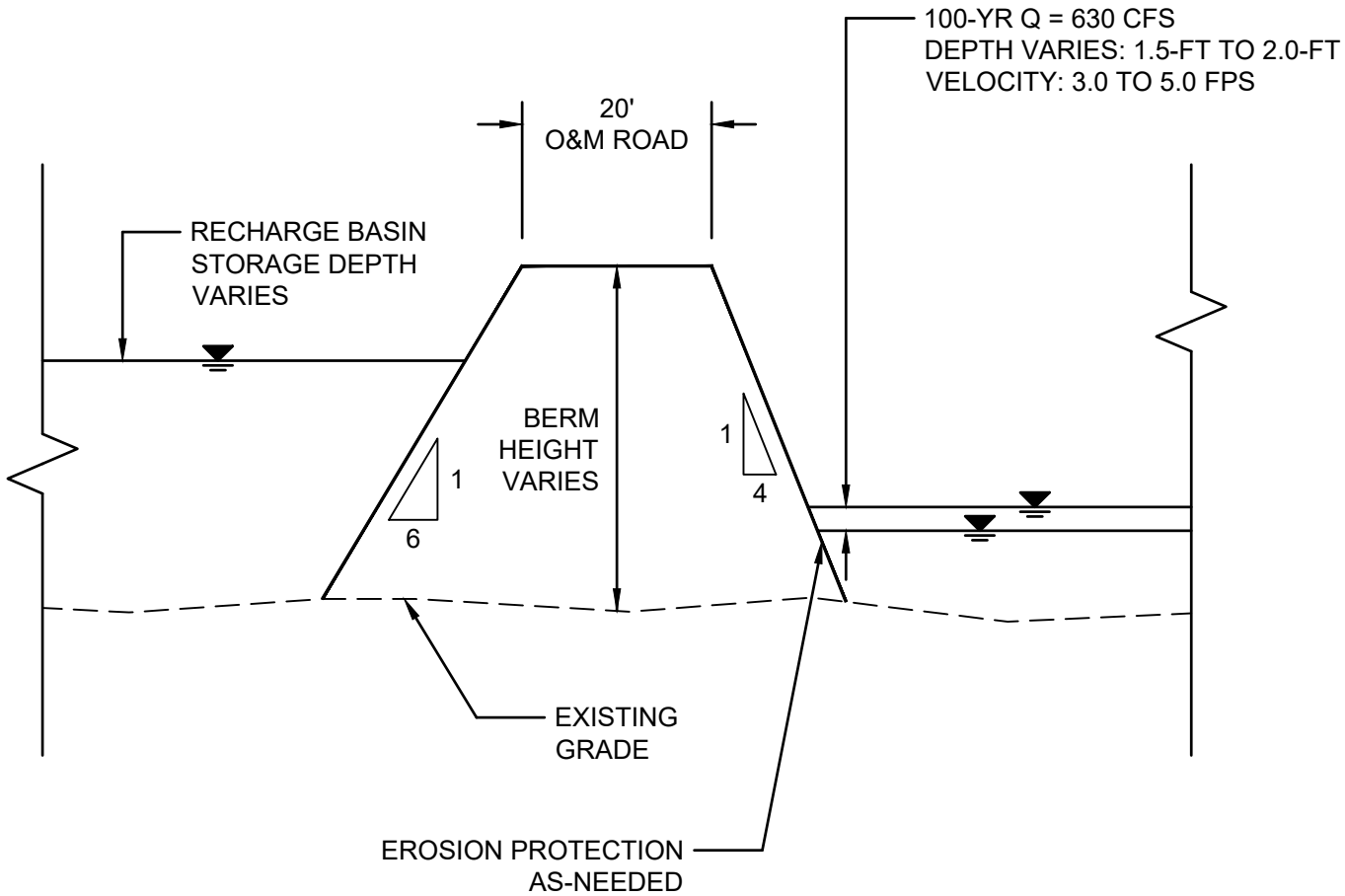
0 10 20 40 FT

VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS
SECTION 'L'



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

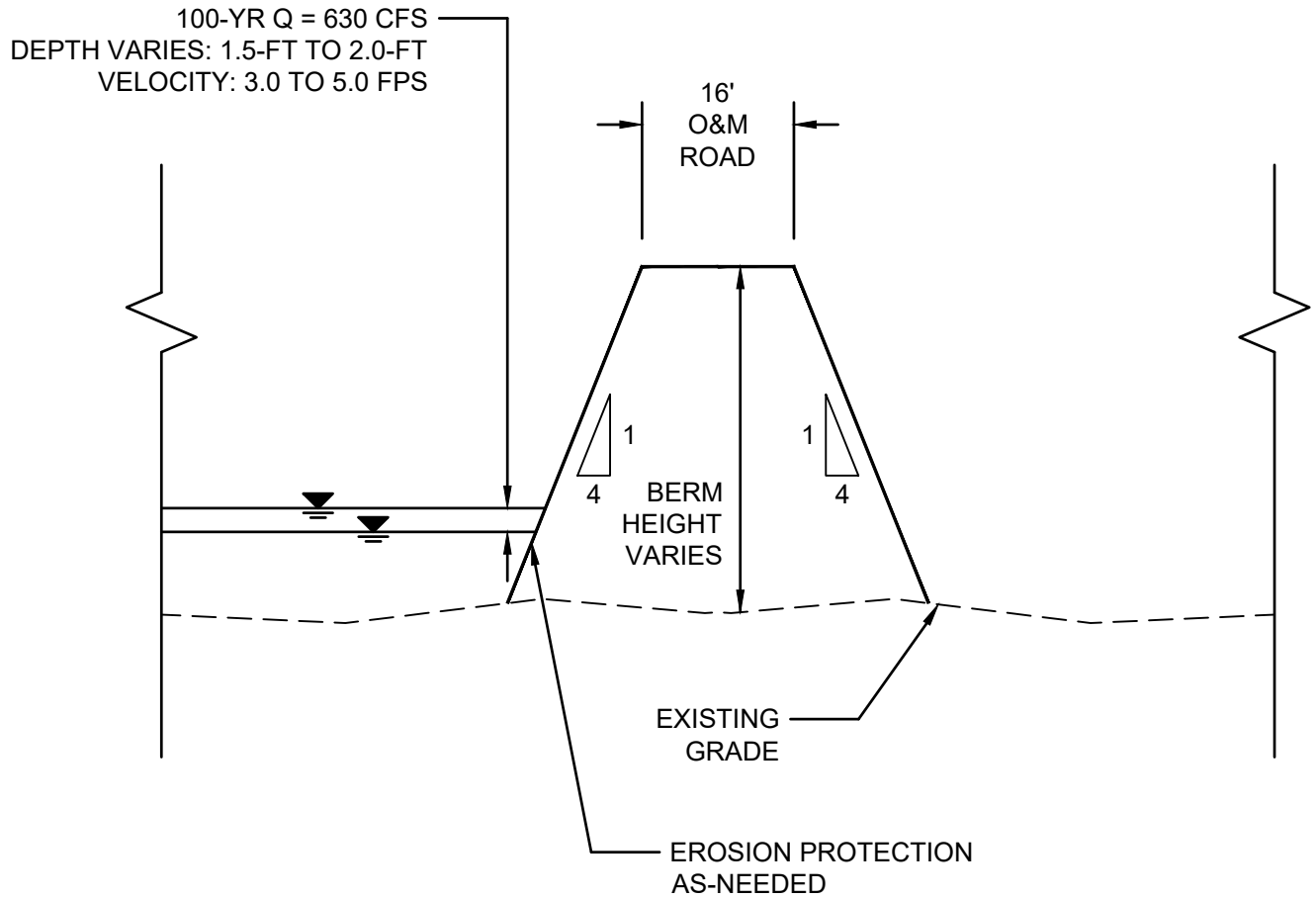
0 10 20 40 FT

VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS
SECTION 'M' (1 - LEFT BERM)



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

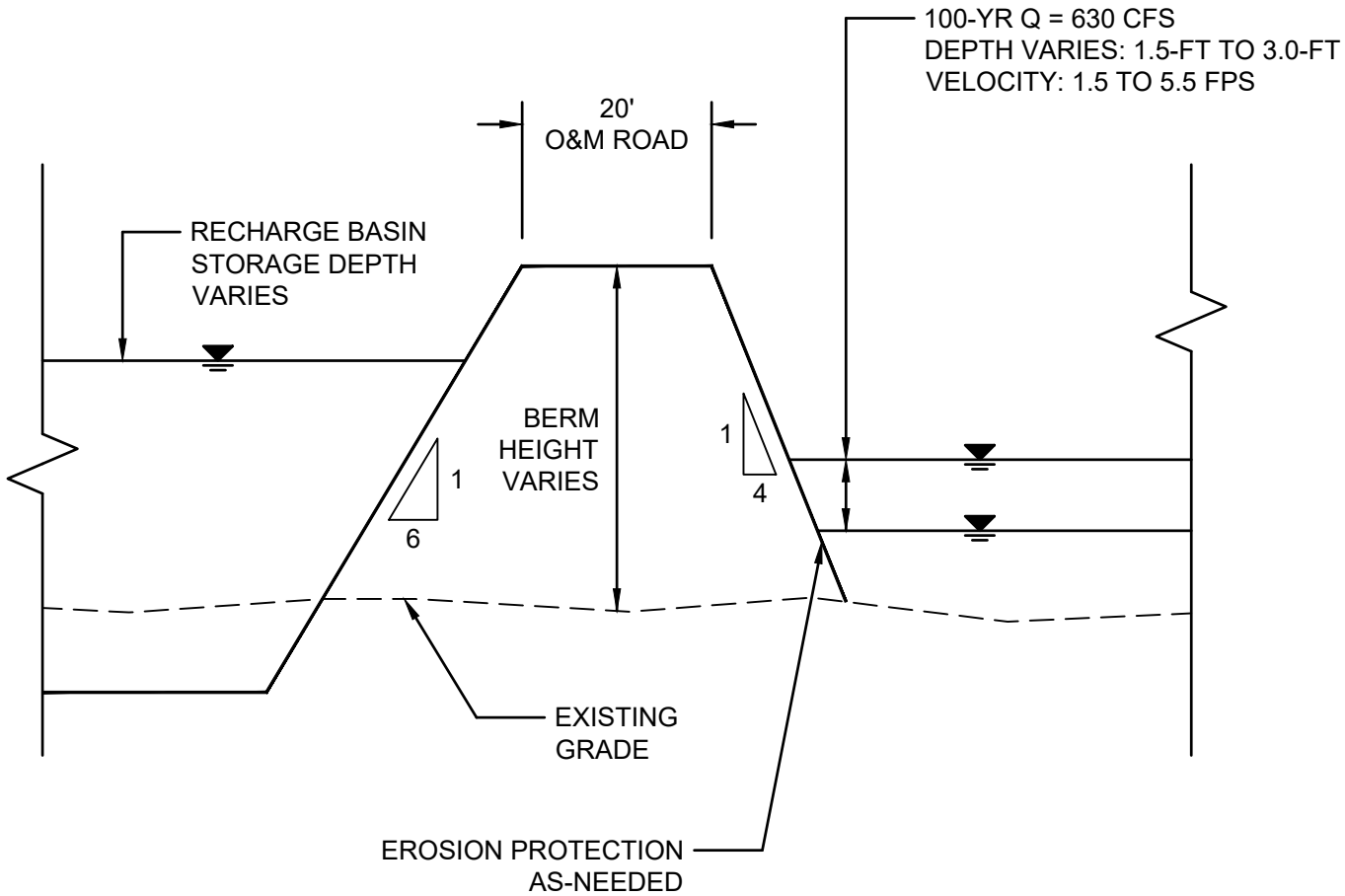
0 10 20 40 FT

VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS
SECTION 'M' (2 - RIGHT BERM)



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

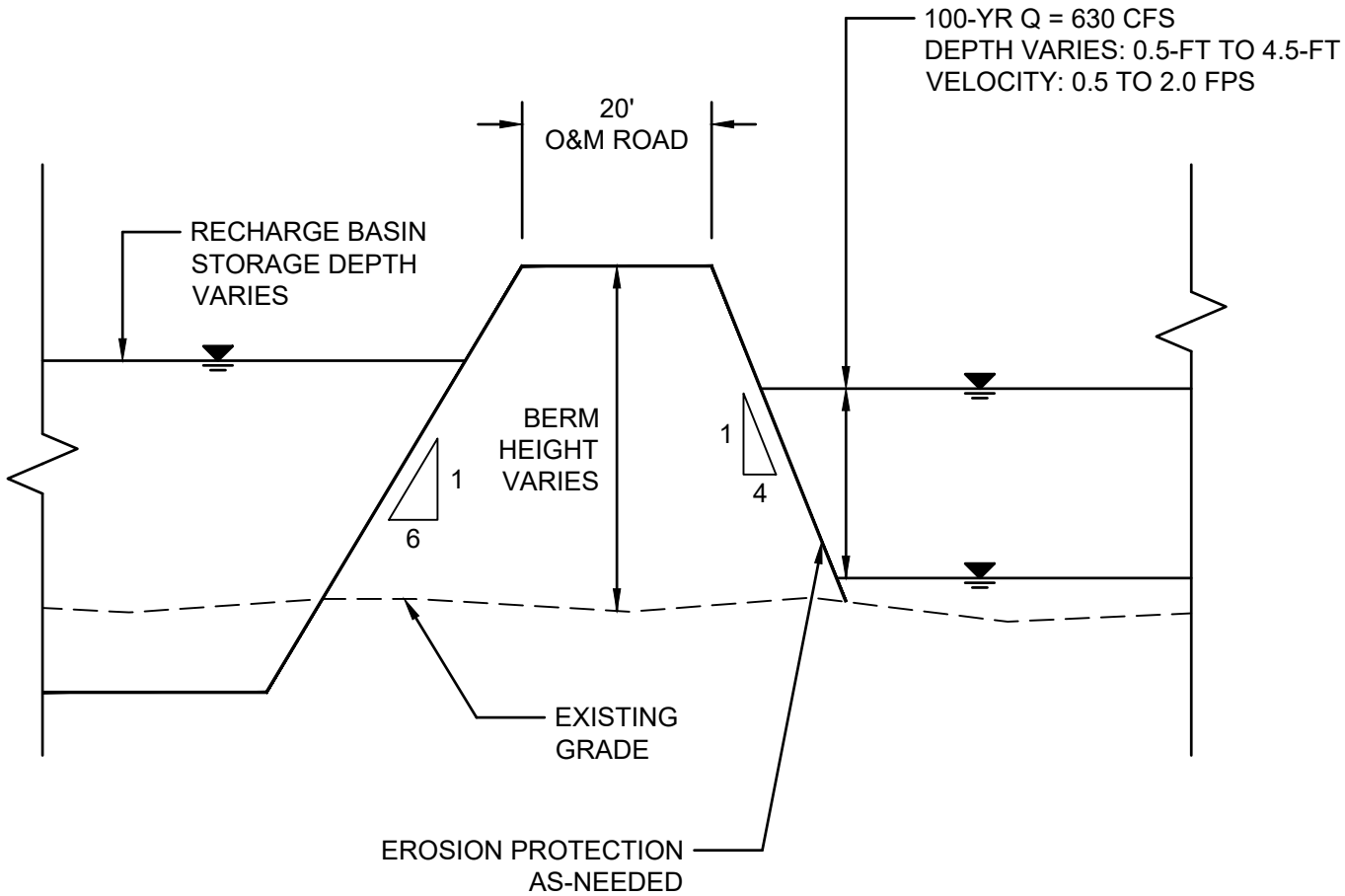
0 10 20 40 FT

VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS
SECTION 'N'



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

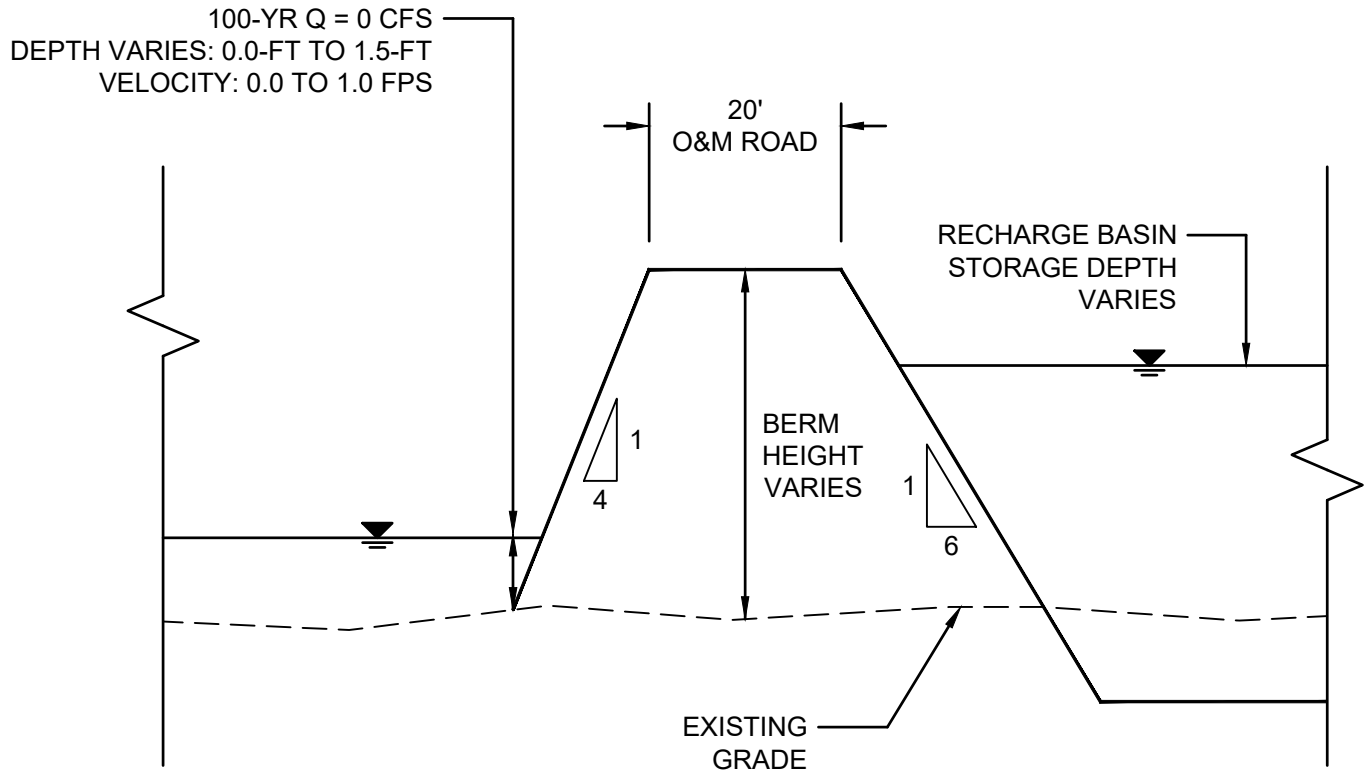
0 10 20 40 FT

VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS
SECTION 'O'



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

0 10 20 40 FT

VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS
SECTION 'P'