DEL PUERTO CANYON
RESERVOIR

FINAL

Environmental Impact Report
Volume II-Appendices

SCH# 2019060254

October 2020

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Del Puerto Canyon Reservoir

Final Environmental Impact Report
Volume II-Appendices
SCH# 2019060254

Prepared for:
Del Puerto Water District
17840 Ward Avenue/P.O. Box 1596
Patterson, CA 95363

Prepared by:
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October 2020

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APPENDIX A: **Scoping: Notice of Preparation, Initial Study and Scoping Report**

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Del Puerto Water District
17840 Ward Avenue
Patterson, CA 95363

NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT AND SCOPING MEETING

TO: Responsible and Trustee Agencies, Organizations, and Interested Parties

FROM: Del Puerto Water District
17840 Ward Avenue/P.O. Box 1596
Patterson, CA 95363

SUBJECT: Notice of Preparation of a Draft Environmental Impact Report for the Del Puerto Canyon Reservoir Project

The Del Puerto Water District will be the lead agency under the California Environmental Quality Act (CEQA) and will prepare an Environmental Impact Report (EIR) for the project identified below.

AGENCIES: The Del Puerto Water District requests the input of public agencies as to the scope and content of the environmental information that is germane to the agency's statutory responsibilities in connection with the proposed project, in accordance with California Code of Regulations, Title 14, Section 15082(b), if the agency will need to use the EIR prepared by the Del Puerto Water District when considering any permit or other approval for the project.

ORGANIZATIONS AND INTERESTED PARTIES: The Del Puerto Water District requests comments and concerns from organizations and interested parties regarding the environmental issues associated with construction and operation of the proposed project.

PROJECT TITLE: Del Puerto Canyon Reservoir Project.

PROJECT LOCATION: Stanislaus County

PROJECT DESCRIPTION: Del Puerto Water District (DPWD), in partnership with the San Joaquin River Exchange Contractors Water Authority (SJRECWA), proposes to construct a reservoir located on Del Puerto Creek in the foothills of the Coast Range Mountains west of Patterson, California and Interstate-5. The proposed reservoir would provide 85,000 acre-feet (AF) of locally-owned off-stream storage South of the Sacramento-San Joaquin Delta. The purpose of the proposed project is to develop a feasible amount of additional South of Delta water storage, utilizing the water after it is moved through the Delta, to maximize the management and efficient use of existing water supplies. Water would be conveyed from the Delta-Mendota Canal (DMC) to be stored in the proposed reservoir and could be discharged either back to the DMC, or possibly in the future to the California Aqueduct. The water stored would serve agricultural users in both DPWD and the SJRECWA member entities service areas, and potentially other South of Delta water suppliers or environmental purposes, including, but not limited to, supply for wildlife refuges designated under the Central Valley Project Improvement Act. The project includes construction of a main dam, four (4) saddle dams, a spillway, inlet/outlet works, conveyance facilities (including a diversion facility on the DMC, a pumping plant, underground pipeline and energy dissipation facilities at the DMC outfall, along with related appurtenant components) and electrical facilities (power supply line and electrical substation). The project also includes relocating existing utilities that run north-south through the project area and Del Puerto Canyon Road, which runs east-west through the project area.

The EIR will assess the environmental effects of constructing and operating the Del Puerto Canyon Reservoir (DPCR or proposed project). The overall objective of the proposed project is to develop additional, locally controlled water storage for South of Delta water users who depend on the CVP for their supply. Specifically, the objectives of the project are as follows:

- Increase water storage capacity in California's Central Valley by 85,000 TAF;
- Improve water supply reliability;
- Increase peak irrigation season water supplies;
- Improve the ability to manage regional groundwater resources; and
- Improve regional self-reliance and economic benefit from agricultural production, jobs, and industry multipliers.

Additional details on the Project are provided in Attachment A.

POTENTIAL ENVIRONMENTAL EFFECTS: Attachment B contains an initial study that identifies the areas of potentially significant environmental impact that will be analyzed in the Draft EIR. As documented in the Initial Study the project has potential impacts in the areas of Aesthetics, Agriculture, Air Quality, Biological Resources, Cultural Resources, Energy, Geology/Soils, Greenhouse Gas Emissions, Hazards & Hazardous Materials, Hydrology/Water Quality, Land Use/Planning, Transportation, Tribal Cultural Resources and Utilities & Service Systems. Potential cumulative impacts will be addressed; alternatives, including the No Project Alternative, will be evaluated.

PUBLIC REVIEW PERIOD: This NOP is available for public review and comment pursuant to California Code of Regulations, Title 14, Section 15082(b) for 30 days. The comment period for the NOP begins June 27, 2019 and ends on July 29, 2019. Due to the limits mandated by State Law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice.

RESPONSES AND COMMENTS: Please indicate a contact person for your agency and send your responses and comments to:

Anthea Hansen, General Manager
Del Puerto Water District
17840 Ward Avenue/P.O. Box 1596
Patterson, CA 95363

SCOPING MEETING: The Del Puerto Water District will hold a scoping meeting on July 24, 2019 from 4:00 p.m. to 6:00 p.m. (open house format) at **Patterson Fire Station #2, 1950 Keystone Pacific Pkwy, Patterson, CA 95363**. You are welcome to attend and present environmental information that you believe should be addressed in the EIR.

The NOP and all CEQA related documents for this project will be available for review on the web. You can view the NOP electronically at: http://delpuertocanyonreservoir.com

If you require additional project information, please contact Anthea Hansen at (209) 892-4470 or ahansen@delpuertowd.org or visit the Del Puerto Canyon Reservoir Project website indicated above.

Anthea G. Hansen

Anthea G. Hansen, General Manager
Del Puerto Water District

Date 6/26/19

ATTACHMENT A

Draft EIR Schedule

DPWD is seeking input on the scope and content of environmental information relevant to the proposed Project, including input on environmental issues and alternatives to be addressed in the EIR. The Draft EIR is scheduled for circulation by Fall 2019.

Background

To increase water supply reliability during the irrigation season and to ensure deliveries during periods when surface water supplies are limited, DPWD and SJRECWA have an identified need to store water to better serve the needs of their Landowners. The existing San Luis Reservoir (SLR) serves both the State Water Project and the federal Central Valley Project (CVP), and Reclamation manages the federal share of storage in SLR. DPWD has limited access to storage capacity in SLR associated with its contract with the U.S. Bureau of Reclamation (Reclamation) – primarily during what is called the Rescheduling Period - and has a restricted ability to store non-Project water or other developed supplies in SLR, while the SJRECWA members have no ability to directly utilize SLR for storage. Due to these limitations, there is an acknowledged need for additional, locally controlled water storage for the project proponents, as well as for all South of Delta water users who depend on the CVP for their supply.

Project Description

The proposed Project is located within Stanislaus County, as shown in **Figure 1**. Proposed project facilities, consisting of a main dam, saddle dams, a spillway, inlet/outlet works, and conveyance facilities, would generally be located west of the City of Patterson (see **Figure 2**). **Figure 3** shows the alignment options for conveyance facilities. Stored water, conveyed to the reservoir from the DMC, would be delivered to customers within DPWD and SJRECWA's service areas, and potentially to South of the Delta wildlife refuges. The proposed project also includes the relocation of a county road and several utilities. **Figure 4** shows the two alternatives for the roadway relocation.

Project Facilities

To deliver water to the proposed reservoir, pipelines and a pumping plant would be constructed. The conveyance system for delivering water from the Delta-Mendota Canal (DMC) into the proposed reservoir and withdrawing water from the proposed reservoir and delivering back into the DMC would include a pumping plant located at the west side of the DMC and a pipeline located between the DMC and the reservoir inlet/outlet works at the base of the reservoir. Four general alignment alternatives, which differ based on how the water would be conveyed to/from the DMC and the reservoir, will be evaluated at an equal level of detail in the EIR. Pipeline construction would require tunneling under Interstate-5, the California Aqueduct and the hills abutting the dam to connect the pipeline to the reservoir and the DMC. Conveyance facilities would include provisions for a future discharge to the California Aqueduct, which would allow water stored in the reservoir to be delivered to the Aqueduct.

The pump station site would include an electrical substation to supply power to the pumps. Primary power supply lines connecting the substation to existing power supply facilities would be expected to follow the conveyance alignment or an existing power line corridor to the north.

Figure 1: DPCR Project Location

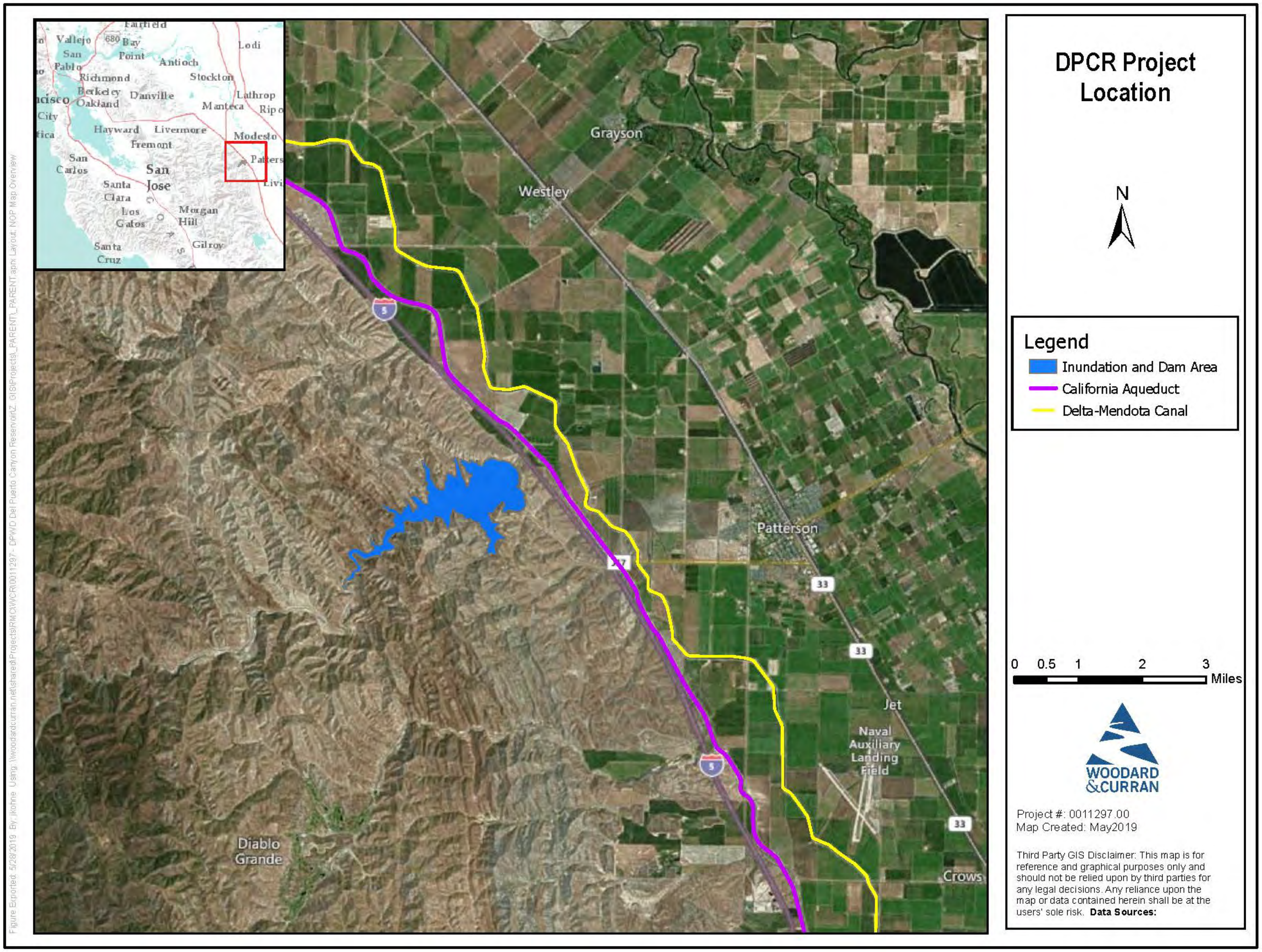


Figure 2: DCPR Reservoir and Utility Corridor

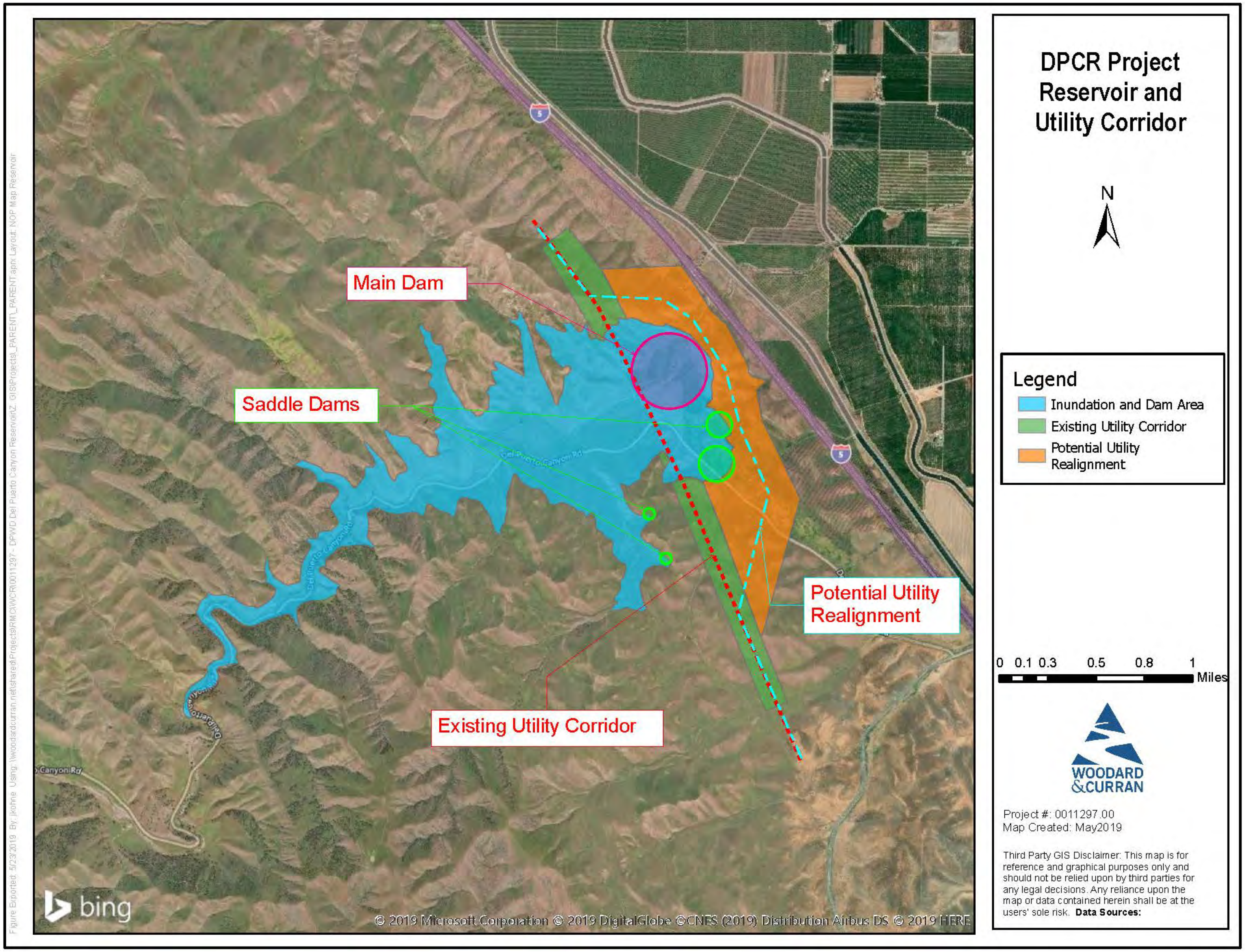


Figure 3: DPCR Conveyance Alternatives

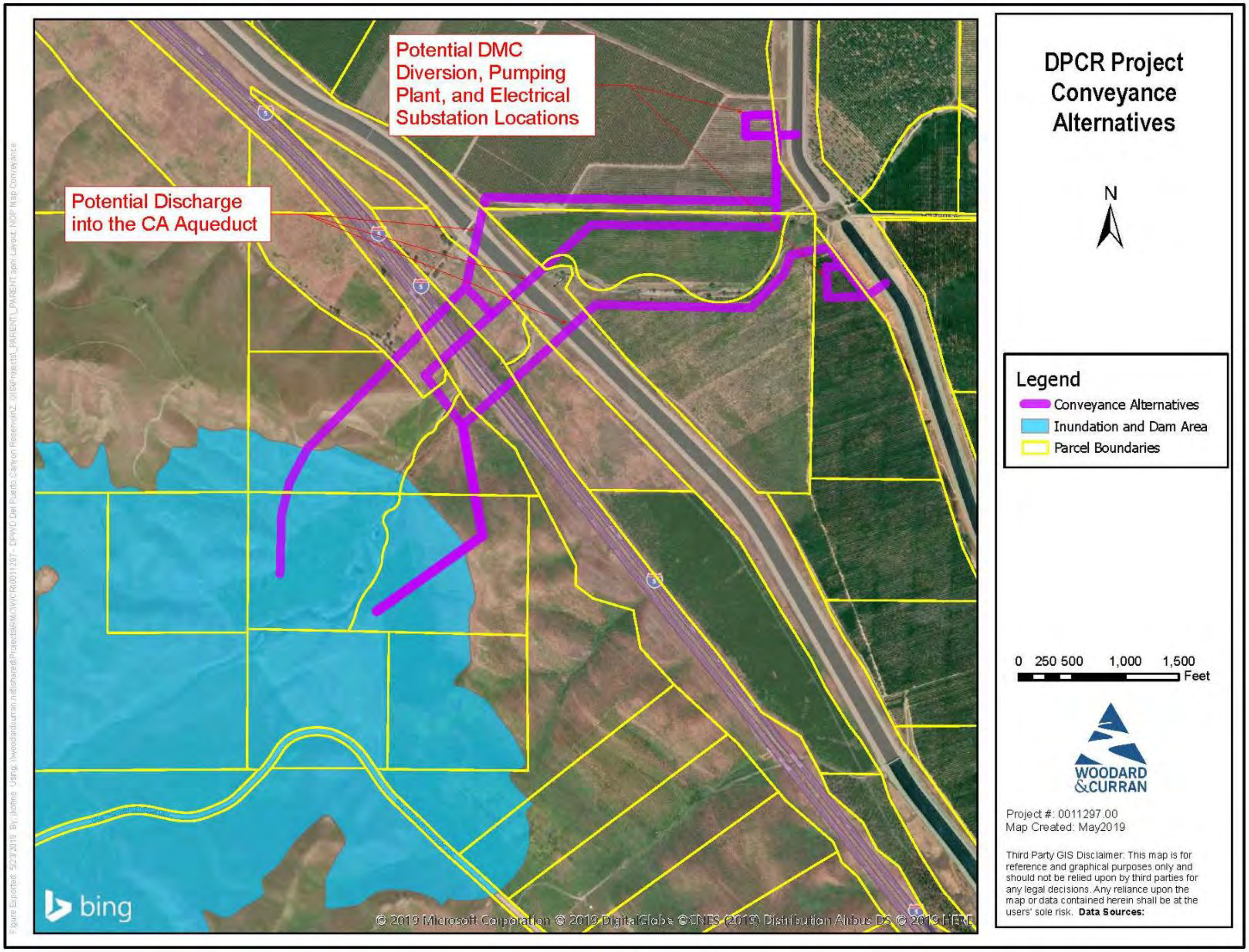
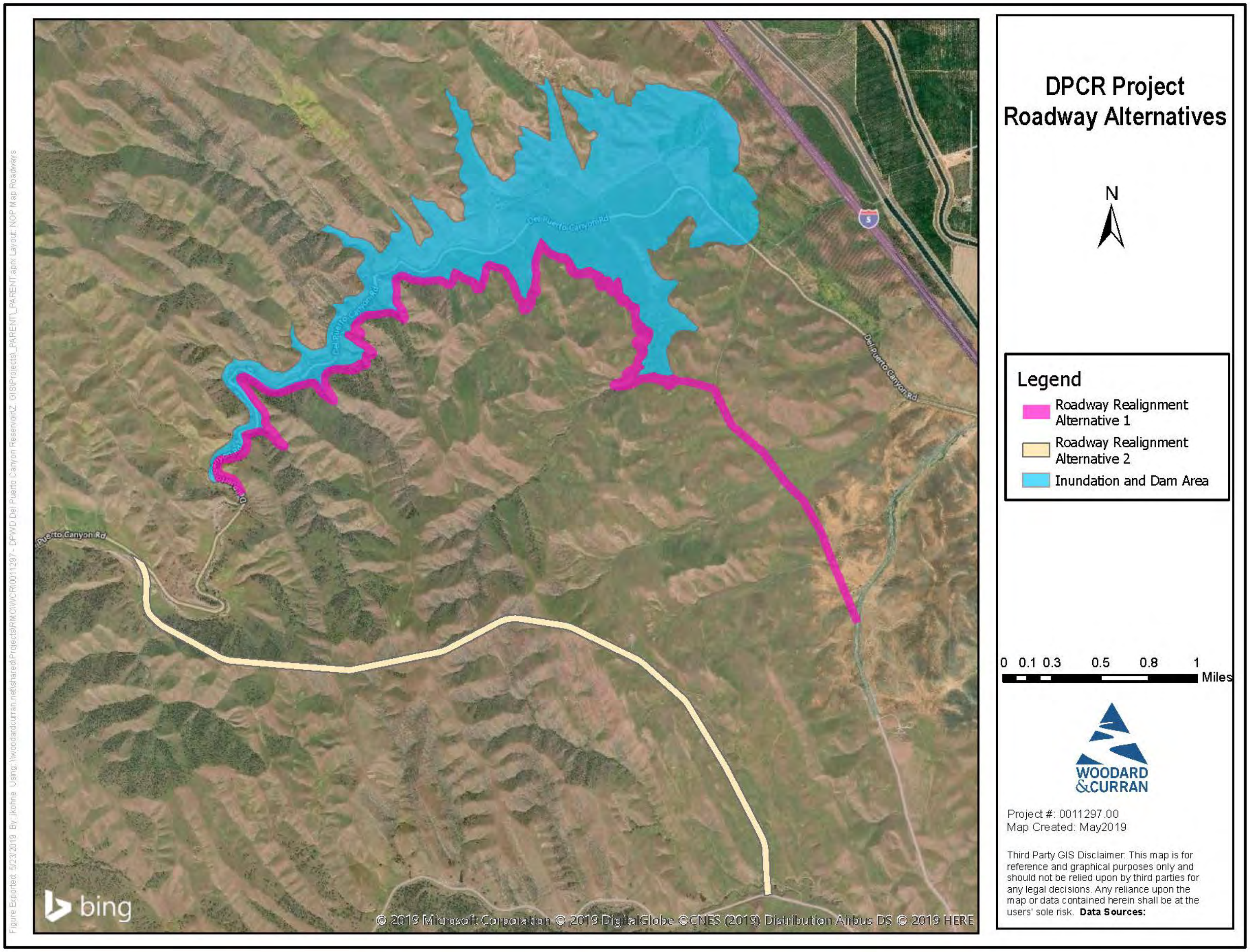


Figure 4: DPCR Roadway Alternatives



The main dam would have a crest width of 30 feet and a crest elevation of 480 feet, creating a reservoir capacity of 85,000 AF at a high water level of 450 feet. The proposed project also includes the construction of four saddle dams, three of which are located along the southern bank of the reservoir and one located along the northern bank. These saddle dams are auxiliary dams constructed to confine the reservoir created by the main dam structure and are constructed in a low spot or "saddle" through which the stored water would otherwise escape. The main dam and four saddle dams will be constructed as zoned earthfill dams given the project site's proximity to the San Joaquin fault. An earthfill dam has greater resilience and ability to safely deform than concrete dams in areas susceptible to high ground shaking events.

A spillway would be constructed on the dam abutment and would consist of an approach channel with an ungated chute spillway, which transfers water from behind the dam down a smooth decline into a large stilling basin below the dam. The spillway would be concrete-lined and would follow an ogee curve (a curve shaped somewhat like a half "S") terminating in a stilling basin. Water would be either pumped into the reservoir or released from the reservoir via the inlet/outlet works, which would be located on and through the abutment. The outlet works would consist of a multi-port sloping intake structure with a control building at the top, outlet tunnel at the base, and an outlet structure consisting of a lift-out chamber and a valve chamber. The outlet chamber would bifurcate downstream of the proposed dam with one side connected to the conveyance system and the other side connected to valves that would allow for emergency releases and environmental flow releases to the spillway stilling basin and Del Puerto Creek.

Additional Project Elements

The proposed project requires the relocation of Del Puerto Canyon Road and would be designed to address existing and proposed utilities. Utilities in the area include four existing and one proposed high-voltage electric transmission lines, local electric distribution lines, fiber-optic cable lines, telephone lines, and natural gas and petroleum pipelines. If feasible, powerline towers would be reconfigured to enable the powerlines to cross over the reservoir pool. If infeasible, the power lines and other utilities would be relocated to the front of the main dam, in between Interstate-5 and the face of the main dam, as shown in **Figure 2**. All utility work would be coordinated with the utility owners.

Del Puerto Canyon Road, listed as a Rural Major Collector in the Stanislaus County General Plan, generally runs east-west through Del Puerto Canyon and connects the City of Patterson to the City of San Jose. The proposed project requires the relocation of the portion of Del Puerto Canyon Road that lies within the reservoir inundation area. Two alignment alternatives will be evaluated at an equal level of detail in the EIR. The first alignment follows the southern extent of the reservoir inundation area; the second alignment is oriented north-south and lies to the west of the inundation area. The second alignment would route traffic along Diablo Grande Parkway from its existing intersection with Del Puerto Canyon Road for 4.2 miles and would then follow a new road north to connect with the existing Del Puerto Canyon Road west of the reservoir. Both alignment alternatives are shown in **Figure 4**.

Attachment B
Initial Study

Del Puerto Canyon Reservoir

Prepared for:

Del Puerto Water District

Prepared by:

WOODARD & CURRAN

2175 North California Boulevard, Suite 315
Walnut Creek, CA 94596

woodardcurran.com

COMMITMENT & INTEGRITY DRIVE RESULTS

Del Puerto Water District
September 2019

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Acronym List

CCID	Central California Irrigation District
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
DMC	Delta-Mendota Canal
DPWD	Del Puerto Water District
EIR	Environmental Impact Report
GHG	Greenhouse gas
HCP	Habitat Conservation Plan
I-5	Interstate 5
IS	Initial Study
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
OHV	Off-Highway Vehicle
PPV	Peak particle velocity
RWQCB	Regional Water Quality Control Board
SJRECWA	San Joaquin River Exchange Contractors Water Authority
SWPPP	Storm Water Pollution Prevention Plan
VMT	Vehicle miles traveled
WAPA	Western Area Power Administration

1. ENVIRONMENTAL CHECKLIST

1. Project title:	Del Puerto Canyon Reservoir Project
2. Lead agency name and address:	Del Puerto Water District 17840 Ward Ave/P.O. Box 1596 Patterson, CA 95363
Contact person and phone number:	Anthea Hansen, General Manager – (209) 892-4470
4. Project location:	Stanislaus County, in the vicinity of Patterson: Reservoir - facilities primarily along Del Puerto Canyon Road Conveyance – from the proposed dam east to Interstate 5, across the California Aqueduct then connecting to the Delta-Mendota Canal (DMC) near Zacharias Road
5. Project sponsor's name and address:	Del Puerto Water District 17840 Ward Ave/P.O. Box 1596 Patterson, CA 95363
6. General plan designation:	• Reservoir: Agriculture • Conveyance: Agriculture, Mixed Use, Light Industrial and possibly Highway Service Commercial and General Commercial depending on alignment option
7. Zoning:	• Reservoir: General Agriculture 40 acre, General Agriculture 160 acre • Conveyance – General Agriculture 40 acre and possibly General Commercial and West Patterson Light Industrial with Planned Development overlay depending on alignment option

8. Description of project: Del Puerto Water District (DPWD), in partnership with the San Joaquin River Exchange Contractors Water Authority (SJRECWA), proposes to construct a reservoir located on Del Puerto Creek in the foothills of the Coast Range Mountains west of Patterson, California and Interstate-5. The proposed reservoir would provide 85,000 acre-feet (AF) of additional off-stream storage South of the Sacramento-San Joaquin Delta. The purpose of the proposed is to develop a feasible amount of South of Delta water storage, utilizing the water after it is moved through the Delta to maximize the management and efficient use of existing water supplies. Water would be conveyed from the DMC to be stored in the proposed reservoir. The water stored would serve agricultural users in both DPWD and the SJRECWA member entities service areas, and potentially other South of Delta water suppliers or environmental purposes, including, but not limited to, supply for wildlife refuges designated under the Central Valley Project Improvement Act. The project includes construction of a main dam, four (4) saddle dams, a spillway, inlet/outlet works, conveyance facilities (including a diversion facility on the DMC, a pumping plant, underground pipeline and energy dissipation facilities at the DMC outfall, along with related appurtenant components) and electrical facilities (power supply line and electrical substation). The project also includes relocating existing utilities that run north-south through the project area and Del Puerto Canyon Road, which runs east-west through the project area.

9. Surrounding land uses and setting: The dam and reservoir would be located in an agricultural setting in Stanislaus County. The conveyance facilities connecting the DMC and reservoir would cross Interstate 5 and the

California Aqueduct and land currently used for agriculture on both sides of the freeway. Land east of Interstate 5 is currently used for agriculture but is designated for future development as a business park.

10. Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement.)

    Potential permits include, but may not be limited to:
    - Army Corps of Engineers: Clean Water Act Section 404 permit
    - U.S. Bureau of Reclamation, approval of financing under Water Infrastructure Improvements for the Nation (WIIN) Act, permit for Installation, Maintenance and Operation of intake structure on DMC, exchange agreements to divert and discharge water into and out of DMC, possible agreement with Reclamation Refuge Water Supply Program.
    - Completion of federal consultation requirements including consultation with U.S. Fish and Wildlife Service, National Marine Fisheries Service and State Historic Preservation Office
    - California Department of Fish and Wildlife: Section 1602 Streambed Alteration Agreement and possibly Incidental Take Permit
    - California Department of Transportation: Encroachment Permit for crossing of Interstate 5
    - California Department of Water Resource: Encroachment Permit for crossing of California Aqueduct
    - State Water Resources Control Board: Notice of Intent (NOI) for coverage under National Pollutant Discharge Elimination System (NPDES) Construction General Permit
    - Regional Water Quality Control Board: Clean Water Act Section 401 Water Quality Certification or Waiver, and possible coverage of dewatering discharges under General Low-Threat Discharge Permit
    - Stanislaus County: approval of road relocation
    - San Joaquin Valley Air Pollution Control District: possible Voluntary Emissions Reduction Agreement

11. Have California Native American tribes traditionally and culturally affiliated with the Project area requested consultation pursuant to Public Resources Code section 2180.3.1? If so, is there a plan for consultation that includes, for example, the determination of significance of impacts to tribal cultural resources, procedures regarding confidentiality, etc.?

    To date no Native American tribes have requested consultation with DPWD.

Environmental Factors Potentially Affected

The environmental factors checked below would be potentially affected by this Project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

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

DETERMINATION: (To be completed by Lead Agency)

On the basis of this initial evaluation:

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

☐ Although the proposed Project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the Project have been made by or agreed to by the Project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☒ The proposed Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

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

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

1.1 Aesthetics

Except as provided in Public Resources Code Section 21099, would the Project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Have a substantial adverse effect on a scenic vista?	☒	☐	☐	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☒	☐	☐	☐
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the Project is in an urbanized area, would the Project conflict with applicable zoning and other regulations governing scenic quality?	☒	☐	☐	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☒	☐	☐	☐

Discussion

a-d) The project is located within an non-urbanized area. Interstate 5 in the project area is designated as a state scenic highway, and the reservoir embankment would be visible from Interstate 5. There are no historic buildings present, but a former almond orchard is visible from the freeway. The EIR will evaluate aesthetic impacts of the Project, including effects on scenic vistas, scenic resources and potential to degrade visual character. Some lighting may be needed for project facilities, and the EIR will evaluate whether this would result in substantial light or glare. The EIR will identify mitigation measures if needed to address aesthetic impacts.

1.2 Agriculture and Forestry Resources

Would the Project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
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?	☒	☐	☐	☐

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☒	☐	☐	☐
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

Discussion

a-b) Both the reservoir footprint and conveyance alignment contain Prime Farmland, Unique Farmland and Farmland of Statewide Importance (Farmland). The project would convert Farmland existing to a storage reservoir, and the EIR will evaluate the impacts on Farmland, conflicts with existing zoning, and the Williamson Act status of the reservoir site.

c-d) The project area contains no forest land and would thus not result in loss of forest land or conflicts with zoning of forest land. There would be no impact and no mitigation is required.

e) The project would serve water to existing agricultural users and would thus not involve changes that would result in conversion of farmland or forest land outside the reservoir to other uses (see item a-b for direct impacts of the project on farmland). The project is consistent with the Stanislaus County General Plan Agricultural Element Objective 3.2, Water Resources. Policy 3.4 encourages conservation of water for agricultural use, and Implementation Measure 4 under that policy specifically states that "The County shall work with local irrigation districts to preserve water rights and ensure that water saved through conservation may be stored and used locally, rather than 'appropriated' and moved to metropolitan areas outside of Stanislaus County."

1.3 Air Quality

Would the Project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Conflict with or obstruct implementation of the applicable air quality plan?	☒	☐	☐	☐
b) Result in a cumulatively considerable net increase of any	☒	☐	☐	☐

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
criteria pollutant for which the Project region is non-attainment under an applicable federal or state ambient air quality standard?				
c) Expose sensitive receptors to substantial pollutant concentrations?	☒	☐	☐	☐
d) Result in other emissions (such as those leading to odors or adversely affecting a substantial number of people?	☐	☐	☐	☒

Discussion

a-c) The project would result in substantial emissions during construction of facilities and limited emissions during operation related to use of maintenance vehicles and operation of pumps. The EIR will evaluate the extent of emissions and develop mitigation measures to minimize emissions.

d) Construction and operation of the project would not generate odors that could affect substantial numbers of people. The reservoir would contain surface water, which is not typically the source of offensive odors.

1.4 Biological Resources

Would the Project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
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 Game or U.S. Fish and Wildlife Service?	☒	☐	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☒	☐	☐	☐
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☒	☐	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☒	☐	☐	☐

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☒	☐	☐	☐
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?	☐	☐	☒	☐

Discussion

a-e) The reservoir and associated facilities would affect potential habitat for a variety of terrestrial and aquatic species. The EIR will evaluate impacts on candidate, sensitive or special status species; effects on riparian habitat and other natural communities, effects on state and federally protected wetlands; impacts on movement of native wildlife and effects on nursery sites, and potential conflicts with local policies and ordinances protecting biological resources, and a listing of mitigation measures to help address impacts.

f) The project is located within the boundaries of the *PG&E San Joaquin Valley Operations & Maintenance Habitat Conservation Plan* (HCP); however, the project partners are not bound to the requirements of this HCP as they are not a permittee, and the Project would not conflict with PG&E's conservation strategy for species covered by the HCP. The Project is not located within or adjacent to the boundaries of any other adopted HCP, adopted Natural Community Conservation Plan or other approved conservation agreement within the County. Therefore, there would be no conflicts with an adopted plan.

1.5 Cultural Resources

Would the Project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	☒	☐	☐	☐
b) Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to §15064.5?	☒	☐	☐	☐
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	☒	☐	☐	☐

Discussion

a-c) Del Puerto Canyon is known to contain cultural resources, and the EIR will evaluate the potential for the project to cause a substantial adverse change to historical and archaeological resources or to disturb human remains and will identify mitigation measures to address potential impacts.

1.6 Energy

Would the Project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☒	☐	☐	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☒	☐	☐	☐

Discussion

a-b) The EIR will evaluate energy required for construction and operation of the project, including the measures that are proposed to ensure that energy consumption is not wasteful, inefficient or unnecessary. Consistency with state and local plans for renewable energy and energy efficiency will be addressed.

1.7 Geology and Soils

Would the Project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☒	☐	☐	☐
iii) Seismic-related ground failure, including liquefaction?	☒	☐	☐	☐
iv) Landslides?	☒	☐	☐	☐
b) Result in substantial soil erosion or the loss of topsoil?	☒	☐	☐	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☒	☐	☐	☐

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☒	☐	☐	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☒	☐	☐	☐

Discussion

a) i) No part of the project area is within an Alquist-Priolo Earthquake Fault Zone. There would be no impact and no mitigation is required.

a) ii-d) There are other geotechnical risks factors in the project area, including the project's proximity to faults in the Coast Range-Sierran Block zone of faulting. The EIR will evaluate geotechnical hazards, including the potential for fault rupture, seismic ground shaking, liquefaction and landslides. Potential for erosion, instability and expansive soils will be addressed, and measures to ensure appropriate design of facilities to address geotechnical hazards will be identified.

e) The project would not generate wastewater and would not require the installation of septic tanks or alternative wastewater disposal systems. Therefore, there would be no impacts related to use of septic tanks or alternative wastewater disposal systems and no mitigation is required.

f) The project area has been identified in the Stanislaus County General Plan EIR (Stanislaus County 2016) as having a high sensitivity for paleontological resources, so the potential for impacts will be evaluated in the EIR and measures to protect resources will be identified, as needed.

1.8 Greenhouse Gas Emissions

Would the Project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☒	☐	☐	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☒	☐	☐	☐

Discussion

a-b) The EIR will estimate greenhouse gas (GHG) emissions during construction and operation and will address consistency with applicable plans policies and regulations.

1.9 Hazards and Hazardous Materials

Would the Project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☒	☐	☐	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a Project located within an airport land use plan or, where such a plan has not been adopted, within 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?	☐	☐	☐	☒
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☒	☐

Discussion

a) The project would not involve the routine transport, use or disposal of hazardous materials other than small amounts of materials such as lubricants that would be used for pump station maintenance during operation of the reservoir. Thus, the project would not create significant hazards to the public or environment.

b) Project construction would require the use of diesel fuel and minor amounts lubricants, paints, solvents and glues. The construction contractor would be required to prepare a Hazardous Management Spill Prevention and Control Plan for hazardous materials management which would address spill control measures and notification and documentation requirements in the event of a spill. There is a PG&E gas pipeline located in the project area between the California Aqueduct and Interstate 5 and proposed pipelines from the dam to the DMC would need to cross this gas pipeline.[1] There is also a petroleum pipeline operated by Shell Pipeline Company that would be within the reservoir footprint.[2] The EIR would evaluate hazards associated with construction in the vicinity of these gas and petroleum pipelines, and the potential relocation of the petroleum pipeline, and would identify procedures and measures to minimize potential upset or accident conditions.

c) The Project site is not located within one-quarter mile of an existing or proposed school. The closest school is Apricot Valley Elementary School in Patterson, which is located more than 2 miles from the point at which the project pipelines would connect to the DMC. There would be no impact and no mitigation is required.

d) The project is not located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. Neither the State Water Resources Control Board Geotracker website[3] nor the Department of Toxic Substances Control Envirostor website[4] identify any hazardous waste clean-up sites or underground storage tanks in the project area. There would be no impact and no mitigation is required.

e) The project is not within two miles of a public airport and is not within the airport influence area of either the Modesto or Oakdale Airports, which are the only public airports in Stanislaus County. There would be no impact and no mitigation is required.

f) Due to the remote nature of the project site, implementation of the project would not affect any emergency response or evacuation plans. Emergency response planning in Stanislaus County centers around evacuation planning in the event of flooding along the San Joaquin River or its tributaries, and the project area is outside the Mid San Joaquin River Regional Flood Management Planning Area[5]. There would be no impact, and no mitigation is required.

g) The project area is in a moderate to high fire hazard severity zone as mapped by CalFire.[6] During construction the contractor would be required to employ fire prevention measures. Once constructed, the reservoir would be filled with water and would not pose a risk of wildland fire. There would be no people or structures in the project area that would be exposed to wildland fire risks and the reservoir could serve as a source of water for firefighting in the event of a wildland fire.

[1] https://www.pge.com/en_US/safety/how-the-system-works/natural-gas-system-overview/gas-transmission-pipeline/gas-transmission-pipelines.page
[2] https://www.shell.us/business-customers/shell-pipeline/interactive-customer-map.html
[3] https://geotracker.waterboards.ca.gov/map/?CMD=runreport&myaddress=patterson%2C+CA
[4] https://www.envirostor.dtsc.ca.gov/public/map/?myaddress=patterson%2C+CA
[5] http://midsjrfloodplan.org/sites/default/files/mid-sjr-region-2252.jpg
[6] http://frap.fire.ca.gov/webdata/maps/stanislaus/fhszs_map.50.pdf

1.10 Hydrology and Water Quality

Would the Project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☐	☒	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
i) result in substantial erosion or siltation on- or off-site;	☐	☐	☒	☐
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;	☐	☐	☒	☐
iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☒	☐
iv) impede or redirect flood flows?	☐	☐	☐	☒
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to Project inundation?	☒	☐	☐	☐
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☐	☒

Discussion

a) The project would not involve direct discharges to surface water or groundwater. Potential for water quality impacts during construction would be minimized by compliance with the statewide *General Permit for Discharges of Storm Water Associated with Construction Activity*, NPDES Order No. CAS000002, Order No. 2009-009-DWQ (Construction General Permit), which requires development and implementation of a Storm Water Pollution Prevention Plan (SWPPP) to protect surface waters from contaminated runoff from erosion or siltation generated during construction.

b) Construction of the reservoir and associated facilities would not require groundwater supplies and would not interfere with groundwater recharge. By providing storage, the project would increase availability of surface water supplies for the project partners and would potentially decrease the need to pump groundwater during dry years when water allocations from the Central Valley Project are reduced. This is a beneficial impact of the project, so no mitigation is required.

c) i) As noted in item a), during construction a SWPPP would be implemented to ensure that construction does not generate result in erosion or siltation.

c) ii) The project would not create substantial amounts of new impervious surface. The reservoir would alter the drainage pattern of Del Puerto Creek and would capture runoff in the Del Puerto Creek watershed with downstream releases to address instream flow requirements and maintain existing natural groundwater recharge. However, downstream releases would not result in flooding on or off site. The relocated road would replace existing road surface with new roadway, but is not expected to substantially increase impervious surface, and the road would be designed to manage drainage in such a way that it would not result in off-site flooding.

c) iii) The reservoir would capture runoff from the Del Puerto Canyon watershed and would release it in a more controlled fashion than occurs for existing flows on Del Puerto Creek. The project would thus not generate runoff that would exceed capacity of existing or planned stormwater drainage systems. Operation of the reservoir would not generate polluted runoff, and as noted in item a), during construction a SWPPP would be implemented to ensure that construction does not generate polluted runoff.

c) iv) The project area is completely outside the 100-year flood plain for the San Joaquin River and its tributaries, so the project would not impede or redirect flood flows and would have no impact on areas that are currently subject to flood risk, and no mitigation is required.

d) The project is not within an area that is currently subject to flooding, tsunami or seiche, but construction of a new dam has the potential to result in risk of flooding in the event of a dam failure. The EIR will evaluate the risk of flooding from inundation as a result of a rupture of the dam embankment.

e) Because the project would not include discharge to surface waters and would not require groundwater it would not interfere with the implementation of a water quality control plan or sustainable groundwater management plan. As noted in item b), the project would provide storage for surface water that could reduce the need for groundwater pumping. There would be no impact and no mitigation is required.

The EIR will also evaluate operational impacts of the reservoir to determine potential changes in flows in Del Puerto Creek downstream of the proposed reservoir and into the San Joaquin River. Project operations will be designed to maintain flows required for beneficial uses in Del Puerto Creek and the San Joaquin River.

The Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Fifth Edition, Revised May 2018, The Sacramento River Basin and the San Joaquin River Basin identifies existing and potential beneficial uses for the San Joaquin River and DMC. Existing beneficial uses of the San Joaquin River in the project area, from the mouth of the Merced River to Vernalis, are: irrigation, stock watering, industrial process water, contact and non-contact recreation, warmwater habitat, warmwater and coldwater fish migration, warmwater spawning and wildlife habitat; municipal and domestic supply is identified as a potential beneficial use. The existing beneficial uses of the DMC are: municipal and domestic supply, irrigation ,stock watering, contact and other non-contact recreation, and wildlife habitat. Del Puerto Creek does not have a specific beneficial use designation identified in the Basin Plan, and thus by default is considered to be suitable for beneficial use for municipal and domestic supply; other beneficial uses can be identified on a case-by-case basis. The EIR will address any measures needed to maintain beneficial uses in the DMC, Del Puerto Creek, and San Joaquin River.

1.11 Land Use and Planning

Would the Project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Physically divide an established community?	☐	☐	☐	☒
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☒	☐	☐	☐

Discussion

a) The closest communities to the project area are Patterson, which is east of the reservoir site, and Diablo Grande, an unincorporated, private gated community located south-west of the reservoir site. The project would not physically divide either community. There would be no impact and no mitigation is required.

b) The reservoir area is zoned for agricultural use. The pipeline from the reservoir to the DMC would cross lands on the west side of the City of Patterson. Alignment options both outside and within the city limits are being evaluated. Depending on the alignment the pipeline might cross land designated as mixed use, light industrial, highway service commercial, and general commercial. The EIR will evaluate project consistency with existing land use plans, policies and regulations and identify mitigation measures, if needed.

1.12 Mineral Resources

Would the Project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

Discussion

a, b) According to the Stanislaus County General Plan[1] there are no identified mineral resources or aggregate areas in the project area. There would be no impact and no mitigation is required.

1.13 Noise

Would the Project result in:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) For a Project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the Project area to excessive noise levels?	☐	☐	☐	☒

Discussion

a) The project would be constructed and operated in an agricultural area. Based on the selected location for the pump station and a roadway alignment along the southern edge of the reservoir, sensitive receptors closest to project facilities are

- a rural residence west of the western end of the reservoir; the residence is located about 3,400 feet from the point where the relocated road would join Del Puerto Canyon Road.
- a rural residence east of the DMC (within the area proposed for future development as the West Patterson Business Park); this residence is about 5,000 feet from the proposed conveyance alignment and pump station at the connection point to the DMC.
- A rural residence on Raines road east of the DMC located about 4,800 feet from the conveyance alignment and pump station connection point to the DMC.

[1] The General Plan references California Geological Survey Appendix III-A – Special Report 173

- a hotel and RV park located along Rogers Road in Patterson, both of which are more than a mile away from the closest possible connection point to the DMC.

b) The Stanislaus County Noise Ordinance establishes exterior noise levels standards for noise sensitive zones, residential, commercial and industrial areas, but project facilities would not be located in any of these areas and the noise ordinance exempts construction or maintenance activities performed by or at the direction of any public entity or utility. The noise ordinance has limits for construction equipment during nighttime hours (7 p.m. to 7 a.m.). Even though some fairly noisy activities such as pile driving and blasting may be required for construction of the reservoir and conveyance facilities, construction noise would not be considered a significant impact, because no nighttime construction is proposed and there are no sensitive receptors located near the construction area for those facilities; noise from construction of the dam, conveyance and pump station would not be perceptible at any sensitive receptors. There is one residence located near the construction area for roadway alignment alternative 2, but grading and paving activities for the roadway in the immediate vicinity of the house would be short-term and would comply with the Stanislaus County Noise Ordinance. Operational noise from the road would be similar to the existing traffic noise on Del Puerto Canyon Road. Operational noise from the pump station that would pump water from the DMC to the reservoir would also be less than significant because noise levels at the nearest sensitive receptor would not exceed ambient noise levels. Pump sizing has not been finalized, so precise noise levels are not available. However, assuming that the project would require five 2,000-horsepower pumps, noise from the pumping plant would be 97 dBA at 5 feet from the pumps, without an enclosure, so the pump noise level at the nearest sensitive receptors would be attenuated to less than 45 dBA at the closest residence on Raines Road and below 38 dBA at the rural residence east of the DMC, which is well below the ambient noise level. Pump noise would thus not be perceptible to receptors along Rogers Road.

b) Project operations would not generate groundborne vibration. Construction activities would generate groundborne vibration, with the greatest potential vibration resulting from pile driving, if needed for construction of any of the project facilities. The Stanislaus County General Plan EIR identifies the lowest possible vibration threshold as a peak particle velocity (PPV) of 0.01 inches/second, which would be barely perceptible for continuous or intermittent frequent vibration sources. The estimated PPV for pile driving would be below the perception threshold for any sensitive receptors more than 1,112 feet from the pile driving activity. There are no sensitive receptors that are within 1,112 feet of potential construction areas, so vibration from construction would not be perceptible at any receptor locations.

c) The project is not within two miles of a private or public airport and is not within the airport influence area of either the Modesto or Oakdale Airports, which are the only public airports in Stanislaus County. There would be no impact and no mitigation is required.

Population and Housing

Would the Project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Discussion

a) The project does not include new homes or businesses in the project area, and therefore would not directly induce growth. The project partners provide irrigation water to existing agricultural users so the ability to store water would not increase existing potable water supplies and thus would not indirectly accommodate additional development in Stanislaus County. There would be no impact and no mitigation is required.

b) There are no people or homes within the areas where project facilities would be constructed so the project would not necessitate construction of replacement housing. There would be no impact and no mitigation is required.

1.14 Public Services

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:	☐	☐	☐	☒
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

Discussion

a) The project includes water storage and conveyance facilities and does not include residential or commercial development that would directly induce population growth and require new or expanded fire and police protection, schools, parks or other facilities. In addition, the project would not indirectly induce unplanned population growth that would place new demands on public service providers because the project will serve existing irrigators. Thus, the project would not require new or expanded governmental facilities. The project would not affect the ability of local providers to maintain acceptable service ratios, response times or other performance objectives for services. There would be no impact and no mitigation is required.

1.15 Recreation

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Would the Project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☒	☐
b) Does the Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

Discussion

a) Because the project would not increase population in the project area (see item 3.14a under Population and Housing), the project would not increase use of existing neighborhood or regional parks or recreational facilities.

The closest park to the project area is Frank Raines Regional Park, which is operated by Stanislaus County Parks & Recreation. The park provides campgrounds and a day use area with picnic tables and shelter, barbecues, playground, sports field, volleyball court and horseshoe pit, restrooms, a recreation hall, over 800 acres for off-highway vehicle (OHV) recreation, and over 1000 acres for non-motorized recreation including biking, hiking and hunting. Access to Frank Raines OHV Park is provided by Del Puerto Canyon Road. The park is about 16 miles west of Interstate 5, and Del Puerto Canyon road from its intersection with Diablo Grande Parkway (less than ¼ mile west of Interstate 5) would be abandoned, and a new road would be constructed to connect Diablo Grande Parkway with the existing Del Puerto Canyon Road. The new road would connect with the existing road at least 9 miles east of Frank Raines OHV Park. Construction of the new road would be staged so as to ensure that the new road is completed before the existing road must be closed for construction of the reservoir. Access to the park would thus not be interrupted. Recreational cyclists use the road, and opportunities for cycling would remain after realignment of Del Puerto Canyon Road, as would public roadway access to all legally recognized recreation areas currently in existence.

b) The project does not include recreational facilities and would not include construction or expansion of existing recreational facilities. There would be no impact and no mitigation is required.

1.16 Transportation

Would the Project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☒	☐	☐	☐
b) Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	☒	☐	☐	☐
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☒	☐	☐	☐
d) Result in inadequate emergency access?	☐	☐	☒	☐

Discussion

a) Del Puerto Canyon Road is defined in the Stanislaus General Plan Circulation Element as a "Major Collector" and provides access to Frank Raines Regional Park and Adobe Springs (the source of Noah's Spring Water) and is used by recreational hikers to access Del Puerto Canyon. The road provides alternate access to Santa Clara and Alameda Counties. No transit routes use Del Puerto Canyon Road, but the road is used as a recreational bicycle and motorcycle route. The portion of the road to be inundated by the reservoir would be abandoned the EIR will consider two options for the road relocation (see Figure 4 in Notice of Preparation). The EIR will develop mitigation for management of construction traffic.

b) The EIR will evaluate changes in vehicle miles travelled (VMT) associated with the two options for the Del Puerto Canyon Road relocation in comparison to VMT of current users of the road.

c) The EIR will evaluate options for relocation of Del Puerto Canyon Road and will consider hazards due to geometric design features. Mitigation measures will be considered if needed.

d) Project construction would be phased so as to maintain adequate emergency access at all times. The existing roadway would not be closed until the road relocation is complete.

1.17 Tribal Cultural Resources

	Potentially Significant Impact	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Would the Project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☒	☐	☐	☐
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☒	☐	☐	☐

Discussion

a) The EIR will evaluate the potential for the project to affect tribal cultural resources that are eligible for the California Register of Historical Resources or meet the criteria for inclusion in the register. The analysis will consider significance of the resource to Native American tribal groups.

1.18 Utilities and Service Systems

Would the Project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☒	☐	☐	☐
b) Have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☐	☒
c) Result in a determination by the wastewater treatment provider which serves or may serve the Project that it has adequate capacity to serve the Project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☒	☐
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☐	☒

Discussion

a) The project would require relocation of existing utilities that cross the reservoir site, including four high-voltage power lines owned by PG&E, a natural gas transmission line owned by PG&E, a petroleum pipeline owned by Shell Pipeline, and a telephone line owned by Frontier Communications Corporation. In addition to existing utilities, the proposed San Luis Transmission Project, which includes a 500 kV transmission line that would be owned and operated by Western Area Power Administration, also crosses the project area.

b) The project would store existing available water supplies and would not have any adverse impacts associated with availability of supplies. There would be no impact and no mitigation is required.

c) The project would not generate any wastewater and would not affect local wastewater treatment providers. There would be no impact and no mitigation is required.

d) Because the project area is undeveloped, construction would generate a minimal amount of solid waste that would require disposal at a landfill, primarily from demolition of structures (small agricultural outbuildings) within the reservoir footprint or relocation of utilities. Construction debris from demolition would be transported and disposed of at suitable landfills; Fink Road Sanitary Landfill is the closest solid waste facility and as of March 2017, had a remaining capacity of 7,184,701 cubic yards[1]. Wood, metal, and other materials would be recycled. Adequate landfill capacity exists in the project area to accommodate the construction debris that would be generated. Therefore, the project would not impair attainment of solid waste reduction goals.

e) The project would comply with all applicable regulations regarding solid waste. There would be no impact and no mitigation is required.

1.19 Wildfire

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☐	☒
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☒	☐
d) Expose people or structures to significant risks, including downslopes or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☒

Discussion

a) The project is within a state responsibility area[2], but is not located in or near a very high fire hazard severity zone[3]. Portions of the site burned in June 2019 in a grass fire, known as the Rock Fire. As noted in item 3.9 f), due to the remote nature of the project site, implementation of the project would not affect any emergency response or evacuation plans. The existing Del Puerto Canyon Road would be relocated so access to the

[1] https://www2.calrecycle.ca.gov/swfacilities/Directory/50-AA-0001/
[2] http://frap.fire.ca.gov/data/frapgismaps/sra11_2/sramap.50.pdf
[3] http://frap.fire.ca.gov/webdata/maps/stanislaus/fhszs_map.50.pdf

area around the reservoir would not be impaired, but the road is not part of an adopted evacuation plan. There would be no impact and no mitigation is required.

b) Operation of a reservoir would not exacerbate wildfire risk, and would provide a source of water for firefighting, if needed. During construction of the project, the construction contractor shall require staging areas, welding areas, or areas slated for construction be cleared of dried vegetation or other materials that could ignite. Construction equipment that includes a spark arrestor shall be maintained in good working order. In addition, construction crews shall have a spotter during welding activities to look out for potentially dangerous situations, such as accidental sparks. Other construction equipment shall be kept in good working order and used only within cleared construction zones. During construction of the proposed project, contractors shall require vehicles and crews working at the project site to have access to functional fire extinguishers. There would be no impact and no mitigation is required.

c) The project would require the relocation of Del Puerto Canyon Road, but the new road location is not expected to exacerbate fire risk as compared to the existing road or result in an increase in ongoing wildfire impacts. Utilities would be relocated from their existing alignment through the proposed reservoir footprint to a new alignment east of the reservoir. Both the existing and proposed alignments cross grassland with very few trees near the transmission facilities, so hazards associated with trees along the alignment would not be increased. Construction safety measures described above in item b) would be followed for road construction.

d) Because the project would not increase wildfire risk, it would not pose a risk from downstream flooding or landslides related to post-fire instability or drainage changes. There would be no impact and no mitigation is required.

1.20 Mandatory Findings of Significance

	Potentially Significant Impact	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Does the Project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☒	☐	☐	☐
b) Does the Project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a Project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☒	☐	☐	☐

c) Does the Project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☒	☐	☐	☐

Discussion

a) The project has the potential to adversely affect biological and cultural resources, and these impacts will be addressed in detail in the EIR, and mitigation measures will be developed to protect sensitive species and historical resources.

b) Cumulative impacts will be evaluated in the EIR.

c) Potential short-term air quality impacts of construction will be addressed, and inundation risks associated with construction of a dam will be evaluated.

2. REPORT PREPARATION

2.1 Report Authors

This report was prepared by Del Puerto Water District, the San Joaquin River Exchange Contractors Authority and Woodard & Curran. Staff from these agencies and companies that were involved include:

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- Chris White

Woodard & Curran

- Robin Cort
- Jenniver Ziv

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MEMORANDUM

TO: DPCR Project Partners
CC: Andy Neal
FROM: Robin Cort
DATE: November 11, 2019
RE: DPCR Scoping Report

This Scoping Report has been prepared to summarize the scoping process completed for the Del Puerto Canyon Reservoir (DPCR) Environmental Impact Report (EIR). It provides an overview of the scoping process completed for the California Environmental Quality Act (CEQA) and summarizes the comments received during scoping.

1. CEQA SCOPING PROCESS

The Del Puerto Water District, the CEQA Lead Agency, circulated a Notice of Preparation (NOP) on June 27, 2019. The NOP began a 30-day public review period, which ended July 29, 2019. The NOP was mailed to the State Clearinghouse and was mailed directly to 14 responsible and trustee agencies. A postcard announcing the availability of the NOP and the date of the scoping meeting was mailed to 35 additional agencies, organizations and individuals. An announcement of the availability of the NOP and the date and time of the scoping meeting was posted in the local newspaper, The Patterson Irrigator.

A publicly advertised scoping meeting was held on July 24, 2019 from 4:00 pm to 6:00 pm at the location below:

Patterson Fire Station #2
1950 Keystone Pacific Parkway, Patterson

The scoping meeting was held in an open house format, and comment cards were provided for those attending the meeting to facilitate submittal of written comments. Because of the format of the meeting there were no verbal comments.

2. COMMENT SUMMARY

A total of 31 comment submittals (letters, comment cards, and emails) were received in response to the Notice of Preparation. In addition, a petition posted online had 108 signatures at the end of the public review period. Comment submittals are included in Attachment A. Table 1 provides a summary of the comments received during the public scoping process, and identifies the commenter, affiliation, date and comment format, summary of comments, and disposition of each comment. All commenters who submitted letters, comment cards or emails, will be added to the mailing list for the project and kept informed about opportunities for public input.

Table 1 Scoping Summary

COMMENTER, AFFILIATION	FORMAT/DATE	COMMENTS	RESPONSE
Central Valley Regional Water Quality Control Board	Letter, July 16, 2019	• All wastewater discharges must comply with the Antidegradation Policy	• The project does not include wastewater discharge.
		• Projects that disturb one or more acre of soil are subject to Construction Storm Water General Permit	• This requirement will be identified in the Water Quality/Hydrology section of the EIR.
		• New development must reduce pollutants and runoff flows using Best Management Practices in accordance with MS4 Permits	• The project would comply with any applicable MS4 requirements.
		• Storm water discharges from industrial sites must comply with the Industrial Storm Water General Permit	• Facilities proposed as part of the DPCR are not expected to require coverage under the Industrial Storm Water General Permit.
		• If the project will involve discharge of fill material in navigable waters or wetlands, a Section 404 Permit would be needed	• This requirement will be identified in the Biological Resources section of the EIR.
		• If a 404 Permit is required, then a Water Quality Certification would be needed from the Regional Board	• This requirement will be identified in the Biological Resources section and Water Quality/Hydrology section of the EIR.
		• If there is fill in a non-jurisdictional water of the state, the project would require a Waste Discharge Requirement (WDR) permit	• This requirement will be identified in the Biological Resources section of the EIR.
		• Discharge of water from construction dewatering would need to be covered under the Low or Limited Threat General NPDES Permit	• This requirement will be identified in the Water Quality/Hydrology section of the EIR.
		• If the property will be used for commercial irrigated agriculture, the discharger will be required to obtain regulatory coverage under the Irrigated Lands Regulatory Program	• The project does not include new irrigated agriculture and existing irrigators supplied by the project are already covered under the Irrigated Lands Regulatory Program.
		• If the project discharges waste that could affect the quality of surface waters a National Pollutant Discharge Elimination System permit would be required.	• The project does not entail discharge of wastewater.
Native American Heritage Commission	Letter July 23, 2019	• AB 52 applies to the project • SB 18 applies to adoption of amendment of a general plan or specific plan or designation of open space	• No Native American groups have requested consultation under AB 52, however letters have been sent to Native American tribes traditionally affiliated with the project area to determine concerns about the project and the EIR will evaluate impacts on tribal cultural resources. • The project does not involve a general plan or specific plan amendment or designation of open space.
		• NAHC provides recommendations for cultural resources assessments	• The analysis of cultural resources impacts has been done in accordance with the NAHC recommendations.
Department of Water Resources, Division of Safety of Dams (DSOD)	Letter July 23, 2019	• The project would be subject to State jurisdiction for safety, so a construction application with plans specifications and appropriate fees must be filed with DSOD	• This requirement will be identified in the EIR.

COMMENTER, AFFILIATION	FORMAT/DATE	COMMENTS	RESPONSE
San Joaquin Valley Air Pollution Control District	Letter, July 24, 2019	• Identify and quantify criteria pollutant emissions during construction and operation	• Construction emissions will be calculated using CalEEMod and results included in the Air Quality section of the EIR. The project does not include any stationary sources of emissions (pumps would be powered by electricity); mobile source emissions from maintenance vehicles would be minimal, but will be evaluated in the EIR.
		• EIR should discuss feasibility of implementing a Voluntary Emission Reduction Agreement (VERA) for the project	• Implementation of a VERA will be discussed in the EIR.
		• Potential for nuisance odors should be evaluated	• The initial study for the project determined that the project would not result in odor impacts.
		• Screening analysis for health impacts is recommended, and a refined health risk assessment should be conducted if the screening results in a score of 10 or more	• The Air Quality section of the EIR will include an evaluation of health impacts.
		• An ambient air quality analysis is recommended if emissions of any pollutant exceed 100 pounds per day	• The Air Quality section of the EIR will quantify emissions.
		• Discuss methodology, model assumptions, inputs and results, including project phasing, project design elements and mitigation, and evaluation of cumulative effects	• This will be included in the Air Quality section of the EIR.
		• The project may be subject to Indirect Source Review Rule	• The Air Quality section of the EIR will explain that the project does not meet the definition of a development project and is thus not subject to indirect source review.
		• Project may be subject to other District Rules	• The Air Quality section of the EIR will identify rules to which the project is subject.
Department of Water Resources	Letter, July 25, 2019	• The project will require an encroachment permit for crossing of the California Aqueduct	• This requirement will be identified in the list of permits that will be included in the introduction to the EIR.
		• Describe project operations; effects on hydrology affecting operation of State Water Project (SWP) and Central Valley Project (CVP)	• The Hydrology/Water Quality section of the EIR will evaluate effects on SWP and CVP operations.
		• Water rights information regarding source of water for the reservoir should be provided	• The Project Description will identify the fact that water stored in the reservoir will be CVP supplies to which the Project Partners are already contractually entitled.
		• EIR should address potential effects on SWP operations and water supplies	• The Hydrology/Water Quality section of the EIR will evaluate effects on SWP operations and water supplies.
California Department of Conservation, Division of Oil, Gas and Geothermal Resources (DOGGR)	Letter July 25, 2019	• DOGGR has identified seven known abandoned oil and gas wells in the vicinity of the reservoir that could be affected by the project • Access to wells should be maintained • Abandoned wells can leak after abandonment	• The Hazardous Materials section of the EIR will document the presence of the wells and their location relative to the inundation area of the proposed reservoir. • Provision of access to wells will be addressed in the EIR. • The Hazardous Materials section of the EIR will identify potential issues associated with well abandonment.

COMMENTER, AFFILIATION	FORMAT/DATE	COMMENTS	RESPONSE
		• Wells should be abandoned to current standards • If unknown wells are discovered DOGGR should be notified • No work may be performed on oil or gas wells without an appropriate permit from DOGGR	• The Hazardous Materials section of the EIR will discuss abandonment standards for existing wells. • DOGGR will be notified if any additional wells are located. • The EIR will identify permitting requirements, as applicable.
Stanislaus County Environmental Review Committee	Letter July 25, 2019	• Please clarify in the project description whether the reservoir would be used for recreation and if body-to-water contact, amplified sound and food facilities would be included.	• The EIR Project Description will explain that the Project Partners are not including recreational facilities in the project but would be open to Stanislaus County developing upland recreation facilities in the future. No water-based recreation is proposed.
Sheila Cornwell	Comment card, July 24, 2019	• Open house format for scoping meeting didn't enable questions from audience	• Staff were available to answer questions and comment cards were provided. Comments can also be submitted in writing. This is not a comment pertinent to the analysis to be conducted in the EIR..
Anonymous	Comment card, July 24, 2019	• The canyon is beautiful and project benefits aren't clear.	• Aesthetic impacts of the project will be addressed in the Aesthetics section of the EIR.
Anonymous	Comment card, July 24, 2019	• The canyon and gateway entrance will be destroyed, and water supply benefits do not outweigh that impact.	• The decision about whether to proceed with the project would include a consideration of the impacts and benefits of the project.
Anonymous	Comment card, July 24, 2019	• Project benefits are vague and don't outweigh impacts to landscape and wildlife.	• Aesthetic impacts of the project will be addressed in the Aesthetics section of the EIR, and impacts to wildlife will be addressed in the Biological Resources section of the EIR. The decision about whether to proceed with the project would include a consideration of the impacts and benefits of the project.
David Froba, Stanislaus Audubon Society	Email, July 26, 2019	• Concerned that habitat for birds and wildlife in Del Puerto Canyon would be affected by the project • The relocated road should maintain access and allow for access and pull out spaces for birders and other recreational uses along the road.	• Potential impacts to wildlife, including birds, will be addressed in the Terrestrial Biological Resources section of the EIR. • Recreational impacts will be addressed in the Land Use and Recreation section of the EIR.
Sean Hansen	Email, July 26, 2019	• Project should include recreational areas for community to swim, boat, jet ski, camp, hike and picnic at reservoir site	• The Project Partners are open to Stanislaus County developing recreation areas in the future, but are not proposing recreational facilities as part of the current project. Neither DPWD nor the Exchange Contractors have the resources or expertise to develop and manage recreation areas, so any recreational facilities would need to be developed and managed by the Stanislaus County Department of Parks and Recreation. The reservoir site could provide upland recreation such as camping, hiking and picnicking, but the reservoir is not expected to be suitable for water-based recreation. The reservoir slopes would be steep and the reservoir would be filled and drained frequently, resulting in extreme changes in water levels. Because of irrigation demands the water level would always drop substantially in the summer making recreational water activities dangerous as new hazards would appear regularly.
Salvatore Salerno	Email, July 27, 2019	• Road realignment should follow reservoir shoreline, which is best for bicycling, birdwatching and other recreational use	• The EIR will discuss two options for the road realignment, and one includes roughly following the reservoir shoreline.

COMMENTER, AFFILIATION	FORMAT/DATE	COMMENTS	RESPONSE
Chris Stovall	Email, July 27, 2019	• What agency will approve the project? It should not be City of Patterson • Project approval should include a study to evaluate feasibility of building a freeway along the route of the proposed road relocation connecting to Interstate 680	• The project would be approved by the Del Puerto Water District; the City of Patterson would not be responsible for approving project design. • Evaluation of a freeway connection to Interstate 680 is beyond the scope of this project and purview of Del Puerto Water District and the Exchange Contractors. The hilly topography of the area presents challenges for relocation of a rural road and does not appear suitable for a freeway route.
Shivaugn M. Alves	Email, July 27, 2019	• The reservoir would eliminate portions of Del Puerto Creek that are enjoyed by the Patterson community and should provide opportunities for hiking, mountain biking, fishing or paddling. • How will project preserve Native American artifacts and dinosaurs? • Pumps should use renewable energy technology, and should not be powered by gas	• The entire reservoir inundation area is presently privately owned and is currently not available for recreational use, other than activities within the existing public right of way along Del Puerto Canyon Road, which is used for cycling, driving and birding/wildlife viewing along the road. The only publicly accessible portion of Del Puerto Creek is at Frank Raines Park, which is over 7 miles west of the upper end of the proposed reservoir. As noted above, the Project Partners are open to Stanislaus County developing recreational facilities adjacent to the reservoir, but water-based recreation is not feasible because of the operational fluctuations in water levels. • The EIR will evaluate the potential presence of Native American artifacts in the Tribal Cultural Resources section of the EIR, and will identify mitigation measures, which could include avoidance or preservation. The potential presence of fossils will be evaluated in the Geology and Soils section of the EIR, and mitigation to protect fossils will be identified. • Project pumps would not be powered by gas, as they would use electric power, produced by either PG&E or TID. Energy use, including use of renewable energy, will be considered in the Energy section of the EIR.
Monica Della Maggiore	Email, July 27, 2019	• Project should include recreation	• As noted above, the Project Partners are open to Stanislaus County developing recreational facilities adjacent to the reservoir, but water-based recreation is not feasible because of the operational fluctuations in water levels.
Debra Cervantes	Email, July 28, 2019	• Project should include swimming, boating and hiking trails	• As noted above, the Project Partners are open to Stanislaus County developing recreational facilities adjacent to the reservoir, but water-based recreation is not feasible because the operational fluctuations in water levels.

COMMENTER, AFFILIATION	FORMAT/DATE	COMMENTS	RESPONSE
Rhonda Allen	Email, July 28, 2019	• Project would affect birds that live in and migrate through area • Reservoir should not be built because San Luis Reservoir has capacity and is never full.	• Potential impacts to wildlife, including birds, will be addressed in the Terrestrial Biological Resources section of the EIR. • Local storage is needed precisely because San Luis Reservoir does not have sufficient capacity. San Luis Reservoir is typically at full capacity during wet periods when water is available and is only empty during periods of water shortage. DPWD has limited access to storage capacity in San Luis Reservoir associated with its contract with U.S. Bureau of Reclamation – primarily during what is called the Rescheduling Period - and has a restricted ability to store “non-Project” water (i.e. non-CVP water) or other developed supplies in the reservoir, while the Exchange Contractors have no ability to directly use San Luis Reservoir for storage. Due to these limitations, there is an acknowledged need for additional, locally controlled water storage for the Project Partners, as well as for all South of Delta water users who depend on the CVP for their supply. The need for the project will be described in the EIR.
Donald Lewis	Email, July 28, 2019	• Del Puerto Canyon is a well-known area for birding recreation, and impacts should be evaluated.	• Potential impacts to wildlife, including birds, will be addressed in the Terrestrial Biological Resources section of the EIR. Impacts to recreation will be evaluated in the Land Use and Recreation section of the EIR.
Julie Beer	Email, July 28, 2019	• Project would have seriously detrimental effect on birds and wildlife in lower Del Puerto Canyon	• Potential impacts to wildlife, including birds, will be addressed in the Terrestrial Biological Resources section of the EIR.
Ray Tackaberry	Email, July 28, 2019	• Five days is not enough time to review the project before the end of the comment period, NOP should have been issued sooner and comment period should be extended for at least another month. • Time of the scoping meeting was not convenient. People who work in the Bay Area cannot be at a meeting by 4 p.m. • Native American history should not be disturbed. • The first dinosaur found in California was found at the site of the proposed dam. • What happens if the dam breaks? • Proposed site has too much history, please reconsider.	• The Notice of Preparation was published in the Patterson Irrigator on June 27, 2019, allowing 30 days for receipt of comments. Notice of the scoping meeting was published in the Patterson Irrigator on July 18, 2019. The scoping period is just the beginning of the opportunities for public input. The public will have the opportunity to review and comment on the Draft EIR, and there will be at least one public meeting during the Draft EIR review period. Certification of the EIR will occur at a publicly- noticed meeting of the Del Puerto Water District Board. • The scoping meeting was held from 4 to 6 p.m. in an open house format so as to allow attendees to arrive any time during the open house. It was not necessary to arrive by 4 p.m. • The EIR will evaluate presence of Native American artifacts in the Tribal Cultural Resources section of the EIR, and will identify mitigation measures, which could include avoidance or preservation. • The potential presence of fossils will be evaluated in the Geology and Soils section of the EIR, and mitigation to protect fossils will be identified. • The Hydrology/Water Quality section of the EIR will include an evaluation of the risk of flooding from a dam break. • Impacts of the project will be considered before a decision is made about whether to proceed with the project.

COMMENTER, AFFILIATION	FORMAT/DATE	COMMENTS	RESPONSE
John H. Harris	Email, July 28, 2019	• Comment period was not well advertised and should be extended.	• The Notice of Preparation was published on June 27, 2019, allowing 30 days for receipt of comments. Notice of the scoping meeting was published in the Patterson Irrigator on July 18, 2019. The scoping period is just the beginning of the opportunities for public input. The public will have the opportunity to review and comment on the Draft EIR, and there will be at least one public meeting during the Draft EIR review period. Certification of the EIR will occur at a publicly-noticed meeting of the Del Puerto Water District Board.
		• The project would have significant recreational impacts because the canyon is used for nature observation and photography and the relocated road should have opportunities for people to pull over for wildlife and wildflower viewing and photography.	• Recreational impacts will be addressed in the Land Use and Recreation section of the EIR.
		• Loss of grassland habitat would affect many birds and wildlife species.	• Potential impacts to wildlife, including birds, will be addressed in the Terrestrial Biological Resources section of the EIR.
Nancy Wenninger Mt. Diablo Audubon Society	Email, July 28, 2019	• Del Puerto Canyon is home to many birds and is popular for birding and wildlife viewing	• Potential impacts to wildlife, including birds, will be addressed in the Terrestrial Biological Resources section of the EIR. Impacts to recreation will be evaluated in the Land Use and Recreation section of the EIR.
		• Please address impacts of artificial lighting on wildlife, especially birds.	• The project would require very little lighting and impacts of lighting on wildlife would be addressed in the Terrestrial Biological Resources section of the EIR.
		• In developing mitigation for habitat loss please acquire and preserve habitat as close as possible to the project.	• The EIR will evaluate options for mitigation of habitat loss and will consider preservation of habitat in proximity to the project.
Wayne Armbrust	Email, July 29, 2019	• EIR needs to evaluate impacts on residents of Del Puerto Canyon	• Impacts on residents of Del Puerto Canyon upstream of the reservoir will be addressed in the EIR.
		• EIR should include mitigation for mosquitos and ticks because standing water and humidity will affect the canyon environmental balance	• The project is within the boundaries of the Turlock Mosquito Abatement District and the Project Partners will coordinate with the District to implement standard local, state, and federal vector control requirements during construction and operation of all Project facilities. Operational requirements for vector control will be described in the Project Description of the EIR.
		• Project will increase the number of people using the canyon which will increase fire risk; residents of canyon do not want increased recreational use	• The Project Partners are not proposing recreational facilities as part of the current project so no increase in the number of people using the canyon would be expected.
		• Road relocation will affect Del Puerto Canyon residents	• Impacts of the road relocation on miles traveled and emergency access for residents will be evaluated in the Transportation section of the EIR.
		• Is land under contract or negotiations for purchase, and if not why not.	• The Project Partners cannot embank on land acquisition until completion of project environmental review. Properties in the project area are not under contract and no negotiations for purchase have started.

COMMENTER, AFFILIATION	FORMAT/DATE	COMMENTS	RESPONSE
		• What is total size of proposed land purchase? • How is the construction and operation of the project (including recreation) going to be funded. • What is the seismic design basis specification? • Where is the flood zone for events that exceed the design basis. • What is going to be done to ensure that the area does not become a homeless encampment • Why was Del Puerto Canyon chosen instead of the Ingram Canyon site, which is rated better than Del Puerto Canyon. • What are the estimated operational expenses in terms of dollar and personnel and what assurance is there that taxpayers will not be burdened by cost.	• The footprint of the dam and reservoir would be about 1,000 acres, but the total size of the land purchase has not yet been determined. Some land would also need to be acquired for the road relocation and acreage has not been determined. The conveyance corridor (from the dam to the Delta-Mendota Canal) is about 250 acres, but only the site of the pumping plant would need to be acquired while an easement would be sufficient for the pipeline route. The Project Partners will likely want to acquire some property around the proposed facilities but may not purchase the entirety of every parcel that would be affected by project facilities. • The Project Partners will fund construction and operation of the project using revenues from the existing water users within their water service areas. Additionally, the Project Partners are working with the U.S. Bureau of Reclamation to obtain funding for construction through the 2016 Water Infrastructure Improvements for the Nation (WIIN) Act. The project, as proposed, does not include recreational use, though the Project Partners are open to Stanislaus County developing recreational facilities adjacent to the reservoir. If the County develops recreational facilities, construction and operation of the facilities would be funded by the County. • The dam would be designed to meet requirements of the California Department of Water Resources Division of Safety of Dams, and other facilities would be designed to meet 2016 edition of Minimum Design Loads and Associated Criteria for Buildings and Other Structures as established by the American Society of Civil Engineers (ASCE). The Geology and Soils section of the EIR will identify the statistical level of ground motion, which will consider the proximity of the project area to nearby faults and will discuss design requirements to address seismic issues. • The Hydrology/Water Quality section of the EIR will include an evaluation of the risk of flooding from a potential dam break or overflow event and will identify the potential extent of any flooding • Public access to the reservoir site would be controlled, and unauthorized access would not be permitted. • The Alternatives Chapter of the EIR will discuss siting alternatives. • Operational expenses have not been determined and cost is not a part of the evaluation of environmental impacts that will be addressed in the EIR. Operational costs of the project will be paid by the Project Partners and costs will not be paid by taxpayers.
Deborah Brusco	Email, July 29, 2019	• Del Puerto Canyon is important to birders/botanists, entomologists, herpetologist, geologist and conservationists, and supports important habitat.	• Potential impacts to wildlife, including birds, will be addressed in the Terrestrial Biological Resources section of the EIR. Impacts to recreation, including wildlife viewing and other uses will be evaluated in the Land Use and Recreation section of the EIR.

COMMENTER, AFFILIATION	FORMAT/DATE	COMMENTS	RESPONSE
		Comments received after 5 PM on July 29, 2019	
Harold Reeve	Email, July 29, 2019	• Del Puerto Canyon has enormous recreational and educational value. • Del Puerto Canyon is a noted birding destination with 177 species of birds recorded from the canyon. • Please look at other locations for the reservoir such as Ingram Creek, Kern Canyon, Crow Creek or Orestimba Creek, which avoid road relocation, and have fewer impacts on educational and recreation values • The environmental checklist does not address educational values or directly address recreational uses associated with wildlife viewing and education.	• The Project Partners appreciate the additional information provided in the comment, which provides valuable context regarding existing uses of the canyon. • Potential impacts to wildlife, including birds, will be addressed in the Terrestrial Biological Resources section of the EIR. • The Alternatives Chapter of the EIR will discuss siting alternatives. • The comment is correct that the standard environmental checklist does not consider educational values. However, impacts to recreation, including wildlife viewing and other uses will be evaluated in the Land Use and Recreation section of the EIR, and input provided by commenters will be considered in the evaluation.
Graham Chisholm	Email, July 29, 2019	• Comment requests inclusion in the list of interested parties	• All commenters who submitted information in response to the Notice of Preparation will be added to the project mailing list.
Elias Funez	Email, July 29, 2019	• There is an ancient Native American path, mortar grinding rocks and other native sites, including the Indian Burial Canyon that would be destroyed if the dam is constructed. • Although the land is private property people still enjoy recreation from the public right of way. People walk, cycle and drive the road to enjoy wildlife, photography and nature. • The project would destroy an important forest with old growth oak and cotton wood trees. • The EIR should consider the seasonal nature of the creek.	• The Project Partners have followed CEQA requirements with respect to impact analysis and Native American Tribes. While archaeological evidence exists indicating the Native American use of the Del Puerto Canyon Reservoir Project area, outreach and consultation efforts to Native American Tribes have not identified any particular interest or identified any cultural significance pertaining to resources in the project area (e.g., ancient Native American path, mortar grinding rocks and other native sites, including the Indian Burial Canyon). Eligible and potentially eligible cultural resources, including built historical resources and archaeological resources identified through impact analysis are further discussed in Section 3.6, Cultural Resources. Tribal Cultural Resources are discussed in Section 3.14. Appendix C provides regional prehistoric and historic context for the reservoir site. • The Project Partners appreciate the information that residents of the local area have provided about recreational uses and will address these uses in the Land Use and Recreation section of the EIR. • Impacts on trees in the canyon will be addressed in the Terrestrial Biological Resources section of the EIR. • The EIR will consider seasonal variation in the creek and will use records from the stream gage that is maintained by the U.S. Geological Survey.

COMMENTER, AFFILIATION	FORMAT/DATE	COMMENTS	RESPONSE
		• If pumps of San Luis Reservoir don't work to store DPWD water when needed, then the pumps should be improved rather than building a new dam and relocating the road. • Project alternatives including a lower version of the dam and reservoir should be considered. The EIR should evaluate options that don't affect Del Puerto Canyon Road. Alternative locations, including Hansen Canyon and Kern Creek Canyon should also be evaluated. • Information on local history of the Canyon is available in the Wild Wild Westside CDD tour available from the City of Patterson.	• Local storage is needed because San Luis Reservoir does not have sufficient capacity. San Luis Reservoir is typically at full capacity during wet periods when water is available and is only empty during periods of water shortage. DPWD has limited access to storage capacity in San Luis Reservoir associated with its contract with the U.S. Bureau of Reclamation – primarily during what is called the Rescheduling Period - and has a restricted ability to store "non-Project" water (i.e. non-CVP water) or other developed supplies in the reservoir, while the Exchange Contractors have no ability to directly use San Luis Reservoir for storage. Due to these limitations, there is an acknowledged need for additional, locally controlled water storage for the Project Partners, as well as for all South of Delta water users who depend on the CVP for their supply. • The Alternatives Chapter of the EIR will discuss siting alternatives. • The Project Partners appreciate this information about local history. The cultural resources evaluation completed for the EIR will contain information about the history of the canyon.
Ron West	Letter July 29, 2019	• Water from Del Puerto Creek should be used; would project block or control existing flow? How would public benefit? • Please consider recreational use of the reservoir including water craft.	• Del Puerto Creek would flow into the reservoir and flows would be released downstream of the dam. The EIR will evaluate how flows should be managed so as not to affect downstream uses. • As noted above, the Project Partners are open to Stanislaus County developing recreational facilities adjacent to the reservoir, but water-based recreation is not feasible because of the operational fluctuations in water levels.
Stanislaus County Department of Environmental Resources	Letter August 6, 2019	• The County concludes that the project would not have a significant effect on the environment. • The County provided information regarding permitting requirements for handling of hazardous materials and/or wastes. • If the project involves the installation of monitoring wells or borings a permit must be obtained from the Hazardous Materials Division of the Department of Environmental Resources.	• The Project Partners appreciate the Count's concurrence with the findings of the Initial Study. • The project is not expected to entail handling or generation of hazardous materials or wastes, other than small amount of fuels, lubricants and paints that would be used during construction. The project would comply with all applicable permit requirement,s which will be discussed in the Hazards and Hazardous Materials section of the EIR. • Borings were conducted as part of the geotechnical evaluation of the project and a permit was obtained as required.

COMMENTER, AFFILIATION	FORMAT/DATE	COMMENTS	RESPONSE
Shivaugn Alves plus 108 signatories	Petition July 29, 2019	• Project should include recreational opportunities (hiking, biking, fishing, disc golf, “SUP”) in natural setting	• As noted above, the Project Partners are open to Stanislaus County developing recreational facilities adjacent to the reservoir, but water-based recreation is not feasible because of the operational fluctuations in water levels.
		• Native American and paleontological artifacts should be preserved for education	• The EIR will evaluate presence of Native American artifacts in the Tribal Cultural Resources section of the EIR, and will identify mitigation measures, which could include avoidance or preservation, The potential presence of fossils will be evaluated in the Geology and Soils section of the EIR, and mitigation to protect fossils will be identified.
		• Solar-powered water pumps should be used to reduce air pollution	• Project pumps would not be a source of emissions as they would use electric power, produced by either PG&E or TID. SB 100 targets 100 percent of electricity to be from carbon neutral sources by 2045. The Air Quality section of the EIR will identify operational emissions for the project and will consider mitigation, as needed.

Attachment A

CALIFORNIA
Water Boards

GAVIN NEWSOM
GOVERNOR
JUL 23 19
12:53P
JARED BLUMENFELD
SECRETARY FOR
ENVIRONMENTAL PROTECTION

Central Valley Regional Water Quality Control Board

16 July 2019

Anthea Hansen
Del Puerto Water District
P.O. Box 1596
Patterson, CA 95363

CERTIFIED MAIL
7017 2620 0001 1359 1274

COMMENTS TO REQUEST FOR REVIEW FOR THE NOTICE OF PREPARATION FOR THE DRAFT ENVIRONMENTAL IMPACT REPORT, DEL PUERTO CANYON RESERVOIR PROJECT, SCH#2019060254, STANISLAUS COUNTY

Pursuant to the State Clearinghouse's 27 June 2019 request, the Central Valley Regional Water Quality Control Board (Central Valley Water Board) has reviewed the *Request for Review for the Notice of Preparation for the Draft Environmental Impact Report* for the Del Puerto Canyon Reservoir Project, located in Stanislaus County.

Our agency is delegated with the responsibility of protecting the quality of surface and groundwaters of the state; therefore our comments will address concerns surrounding those issues.

I. Regulatory Setting

Basin Plan

The Central Valley Water Board is required to formulate and adopt Basin Plans for all areas within the Central Valley region under Section 13240 of the Porter-Cologne Water Quality Control Act. Each Basin Plan must contain water quality objectives to ensure the reasonable protection of beneficial uses, as well as a program of implementation for achieving water quality objectives with the Basin Plans. Federal regulations require each state to adopt water quality standards to protect the public health or welfare, enhance the quality of water and serve the purposes of the Clean Water Act. In California, the beneficial uses, water quality objectives, and the Antidegradation Policy are the State's water quality standards. Water quality standards are also contained in the National Toxics Rule, 40 CFR Section 131.36, and the California Toxics Rule, 40 CFR Section 131.38.

The Basin Plan is subject to modification as necessary, considering applicable laws, policies, technologies, water quality conditions and priorities. The original Basin Plans were adopted in 1975, and have been updated and revised periodically as required, using Basin Plan amendments. Once the Central Valley Water Board has adopted a Basin Plan amendment in noticed public hearings, it must be approved by the State Water Resources Control Board (State Water Board), Office of Administrative Law (OAL) and in some cases, the United States Environmental

Protection Agency (USEPA). Basin Plan amendments only become effective after they have been approved by the OAL and in some cases, the USEPA. Every three (3) years, a review of the Basin Plan is completed that assesses the appropriateness of existing standards and evaluates and prioritizes Basin Planning issues. For more information on the *Water Quality Control Plan for the Sacramento and San Joaquin River Basins*, please visit our website: http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/

Antidegradation Considerations

All wastewater discharges must comply with the Antidegradation Policy (State Water Board Resolution 68-16) and the Antidegradation Implementation Policy contained in the Basin Plan. The Antidegradation Implementation Policy is available on page 74 at:
https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr_201805.pdf

In part it states:

> *Any discharge of waste to high quality waters must apply best practicable treatment or control not only to prevent a condition of pollution or nuisance from occurring, but also to maintain the highest water quality possible consistent with the maximum benefit to the people of the State.*
>
> *This information must be presented as an analysis of the impacts and potential impacts of the discharge on water quality, as measured by background concentrations and applicable water quality objectives.*

The antidegradation analysis is a mandatory element in the National Pollutant Discharge Elimination System and land discharge Waste Discharge Requirements (WDRs) permitting processes. The environmental review document should evaluate potential impacts to both surface and groundwater quality.

II. Permitting Requirements

Construction Storm Water General Permit

Dischargers whose project disturb one or more acres of soil or where projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the General Permit for Storm Water Discharges Associated with Construction Activities (Construction General Permit), Construction General Permit Order No. 2009-009-DWQ. Construction activity subject to this permit includes clearing, grading, grubbing, disturbances to the ground, such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). For more information on the Construction General Permit, visit the State Water Resources Control Board website at:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml

Phase I and II Municipal Separate Storm Sewer System (MS4) Permits[1]
The Phase I and II MS4 permits require the Permittees reduce pollutants and runoff flows from new development and redevelopment using Best Management Practices (BMPs) to the maximum extent practicable (MEP). MS4 Permittees have their own development standards, also known as Low Impact Development (LID)/post-construction standards that include a hydromodification component. The MS4 permits also require specific design concepts for LID/post-construction BMPs in the early stages of a project during the entitlement and CEQA process and the development plan review process.

For more information on which Phase I MS4 Permit this project applies to, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/municipal_permits/

For more information on the Phase II MS4 permit and who it applies to, visit the State Water Resources Control Board at:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/phase_ii_municipal.shtml

Industrial Storm Water General Permit
Storm water discharges associated with industrial sites must comply with the regulations contained in the Industrial Storm Water General Permit Order No. 2014-0057-DWQ. For more information on the Industrial Storm Water General Permit, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/industrial_general_permits/index.shtml

Clean Water Act Section 404 Permit
If the project will involve the discharge of dredged or fill material in navigable waters or wetlands, a permit pursuant to Section 404 of the Clean Water Act may be needed from the United States Army Corps of Engineers (USACE). If a Section 404 permit is required by the USACE, the Central Valley Water Board will review the permit application to ensure that discharge will not violate water quality standards. If the project requires surface water drainage realignment, the applicant is advised to contact the Department of Fish and Game for information on Streambed Alteration Permit requirements. If you have any questions regarding the Clean Water Act Section 404 permits, please contact the Regulatory Division of the Sacramento District of USACE at (916) 557-5250.

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[1] Municipal Permits = The Phase I Municipal Separate Storm Water System (MS4) Permit covers medium sized Municipalities (serving between 100,000 and 250,000 people) and large sized municipalities (serving over 250,000 people). The Phase II MS4 provides coverage for small municipalities, including non-traditional Small MS4s, which include military bases, public campuses, prisons and hospitals.

Clean Water Act Section 401 Permit – Water Quality Certification

If an USACE permit (e.g., Non-Reporting Nationwide Permit, Nationwide Permit, Letter of Permission, Individual Permit, Regional General Permit, Programmatic General Permit), or any other federal permit (e.g., Section 10 of the Rivers and Harbors Act or Section 9 from the United States Coast Guard), is required for this project due to the disturbance of waters of the United States (such as streams and wetlands), then a Water Quality Certification must be obtained from the Central Valley Water Board prior to initiation of project activities. There are no waivers for 401 Water Quality Certifications. For more information on the Water Quality Certification, visit the Central Valley Water Board website at: https://www.waterboards.ca.gov/centralvalley/water_issues/water_quality_certification/

Waste Discharge Requirements – Discharges to Waters of the State

If USACE determines that only non-jurisdictional waters of the State (i.e., "non-federal" waters of the State) are present in the proposed project area, the proposed project may require a Waste Discharge Requirement (WDR) permit to be issued by Central Valley Water Board. Under the California Porter-Cologne Water Quality Control Act, discharges to all waters of the State, including all wetlands and other waters of the State including, but not limited to, isolated wetlands, are subject to State regulation. For more information on the Waste Discharges to Surface Water NPDES Program and WDR processes, visit the Central Valley Water Board website at:https://www.waterboards.ca.gov/centralvalley/water_issues/waste_to_surface_water/

Projects involving excavation or fill activities impacting less than 0.2 acre or 400 linear feet of non-jurisdictional waters of the state and projects involving dredging activities impacting less than 50 cubic yards of non-jurisdictional waters of the state may be eligible for coverage under the State Water Resources Control Board Water Quality Order No. 2004-0004-DWQ (General Order 2004-0004). For more information on the General Order 2004-0004, visit the State Water Resources Control Board website at: https://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2004/wqo/wqo2004-0004.pdf

Dewatering Permit

If the proposed project includes construction or groundwater dewatering to be discharged to land, the proponent may apply for coverage under State Water Board General Water Quality Order (Low Risk General Order) 2003-0003 or the Central Valley Water Board's Waiver of Report of Waste Discharge and Waste Discharge Requirements (Low Risk Waiver) R5-2013-0145. Small temporary construction dewatering projects are projects that discharge groundwater to land from excavation activities or dewatering of underground utility vaults. Dischargers seeking coverage under the General Order or Waiver must file a Notice of Intent with the Central Valley Water Board prior to beginning discharge.

For more information regarding the Low Risk General Order and the application process, visit the Central Valley Water Board website at:

http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2003/wqo/wqo2003-0003.pdf

For more information regarding the Low Risk Waiver and the application process, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/waivers/r5-2013-0145_res.pdf

Regulatory Compliance for Commercially Irrigated Agriculture
If the property will be used for commercial irrigated agricultural, the discharger will be required to obtain regulatory coverage under the Irrigated Lands Regulatory Program.

There are two options to comply:

1. **Obtain Coverage Under a Coalition Group.** Join the local Coalition Group that supports land owners with the implementation of the Irrigated Lands Regulatory Program. The Coalition Group conducts water quality monitoring and reporting to the Central Valley Water Board on behalf of its growers. The Coalition Groups charge an annual membership fee, which varies by Coalition Group. To find the Coalition Group in your area, visit the Central Valley Water Board's website at: https://www.waterboards.ca.gov/centralvalley/water_issues/irrigated_lands/regulatory_information/for_growers/coalition_groups/ or contact water board staff at (916) 464-4611 or via email at IrrLands@waterboards.ca.gov.

2. **Obtain Coverage Under the General Waste Discharge Requirements for Individual Growers, General Order R5-2013-0100**. Dischargers not participating in a third-party group (Coalition) are regulated individually. Depending on the specific site conditions, growers may be required to monitor runoff from their property, install monitoring wells, and submit a notice of intent, farm plan, and other action plans regarding their actions to comply with their General Order. Yearly costs would include State administrative fees (for example, annual fees for farm sizes from 11-100 acres are currently $1,277 + $8.53/Acre); the cost to prepare annual monitoring reports; and water quality monitoring costs. To enroll as an Individual Discharger under the Irrigated Lands Regulatory Program, call the Central Valley Water Board phone line at (916) 464-4611 or e-mail board staff at IrrLands@waterboards.ca.gov.

Limited Threat General NPDES Permit
If the proposed project includes construction dewatering and it is necessary to discharge the groundwater to waters of the United States, the proposed project will require coverage under a National Pollutant Discharge Elimination System (NPDES) permit. Dewatering discharges are typically considered a low or limited threat to water quality and may be covered under the General Order for *Limited Threat Discharges to Surface Water* (Limited Threat General Order). A complete Notice of Intent must be submitted to the Central Valley Water Board to obtain

coverage under the Limited Threat General Order. For more information regarding the Limited Threat General Order and the application process, visit the Central Valley Water Board website at:
https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2016-0076-01.pdf

NPDES Permit
If the proposed project discharges waste that could affect the quality of surface waters of the State, other than into a community sewer system, the proposed project will require coverage under a National Pollutant Discharge Elimination System (NPDES) permit. A complete Report of Waste Discharge must be submitted with the Central Valley Water Board to obtain a NPDES Permit. For more information regarding the NPDES Permit and the application process, visit the Central Valley Water Board website at:
https://www.waterboards.ca.gov/centralvalley/help/permit/

If you have questions regarding these comments, please contact me at (916) 464-4812 or Jordan.Hensley@waterboards.ca.gov.

Stephanie Tadlock
for Jordan Hensley
Environmental Scientist

cc: State Clearinghouse unit, Governor's Office of Planning and Research, Sacramento

NATIVE AMERICAN HERITAGE COMMISSION
Cultural and Environmental Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691 Phone (916) 373-3710
Email: nahc@nahc.ca.gov
Website: http://www.nahc.ca.gov
Twitter: @CA_NAHC

July 23, 2019

Governor's Office of Planning & Research

JULY 23 2019

STATE CLEARINGHOUSE

Anthea Hansen
Del Puerto Water District
17840 Ward Avenue, P.O. Box 1596
Patterson, CA 95363

RE: SCH# 2019060254 Del Puerto Canyon Reservoir, Stanislaus County

Dear Ms. Hansen:

The Native American Heritage Commission (NAHC) has received the Notice of Preparation (NOP), Draft Environmental Impact Report (DEIR) or Early Consultation for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code §21000 et seq.), specifically Public Resources Code §21084.1, states that a project that may cause a substantial adverse change in the significance of a historical resource, is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit.14, §15064.5 (b) (CEQA Guidelines §15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an Environmental Impact Report (EIR) shall be prepared. (Pub. Resources Code §21080 (d); Cal. Code Regs., tit. 14, § 5064 subd.(a)(1) (CEQA Guidelines §15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources within the area of potential effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a separate category of cultural resources, "tribal cultural resources" (Pub. Resources Code §21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment. (Pub. Resources Code §21084.2). Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code §21084.3 (a)). **AB 52 applies to any project for which a notice of preparation, a notice of negative declaration, or a mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements**. If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. §800 et seq.) may also apply.

The NAHC recommends consultation with California Native American tribes that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments.

Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.

AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a lead agency shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:

   a. A brief description of the project.
   b. The lead agency contact information.
   c. Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code §21080.3.1 (d)).
   d. A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code §21073).

2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A lead agency shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code §21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or Environmental Impact Report. (Pub. Resources Code §21080.3.1(b)).

   a. For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code §65352.4 (SB 18). (Pub. Resources Code §21080.3.1 (b)).

3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:

   a. Alternatives to the project**.**
   b. Recommended mitigation measures**.**
   c. Significant effects**.** (Pub. Resources Code §21080.3.2 (a)).

4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:

   a. Type of environmental review necessary.
   b. Significance of the tribal cultural resources.
   c. Significance of the project's impacts on tribal cultural resources.
   d. If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code §21080.3.2 (a)).

5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code §6254 (r) and §6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code §21082.3 (c)(1)).

6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:

   a. Whether the proposed project has a significant impact on an identified tribal cultural resource.
   b. Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code §21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code §21082.3 (b)).

7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:
    a. The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or
    b. A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code §21080.3.2 (b)).

8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code §21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code §21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code §21082.3 (a)).

9. Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code §21084.3 (b). (Pub. Resources Code §21082.3 (e)).

10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:
    a. Avoidance and preservation of the resources in place, including, but not limited to:
        i. Planning and construction to avoid the resources and protect the cultural and natural context.
        ii. Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.
    b. Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:
        i. Protecting the cultural character and integrity of the resource.
        ii. Protecting the traditional use of the resource.
        iii. Protecting the confidentiality of the resource.
    c. Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.
    d. Protecting the resource. (Pub. Resource Code §21084.3 (b)).
    e. Please note that a federally recognized California Native American tribe or a non-federally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code §815.3 (c)).
    f. Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code §5097.991).

11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An Environmental Impact Report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:
    a. The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code §21080.3.1 and §21080.3.2 and concluded pursuant to Public Resources Code §21080.3.2.
    b. The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.
    c. The lead agency provided notice of the project to the tribe in compliance with Public Resources Code §21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code §21082.3 (d)).

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf

SB 18

SB 18 applies to local governments and requires local governments to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code §65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code §65352.3 (a)(2)).
2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.
3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code §65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code §5097.9 and §5097.993 that are within the city's or county's jurisdiction. (Gov. Code §65352.3 (b)).
4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:
    a. The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
    b. Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: http://nahc.ca.gov/resources/forms/

NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (http://ohp.parks.ca.gov/?page_id=1068) for an archaeological records search. The records search will determine:
    a. If part or all of the APE has been previously surveyed for cultural resources.
    b. If any known cultural resources have already been recorded on or adjacent to the APE.
    c. If the probability is low, moderate, or high that cultural resources are located in the APE.
    d. If a survey is required to determine whether previously unrecorded cultural resources are present.

2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
    a. The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.
    b. The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

3. Contact the NAHC for:
   - **a.** A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.
   - **b.** A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.

4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.
   - **a.** Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, §15064.5(f) (CEQA Guidelines §15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.
   - **b.** Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.
   - **c.** Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code §7050.5, Public Resources Code §5097.98, and Cal. Code Regs., tit. 14, §15064.5, subdivisions (d) and (e) (CEQA Guidelines §15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

If you have any questions or need additional information, please contact me at my email address: Gayle.Totton@nahc.ca.gov.

Sincerely,

for

Gayle Totton
Associate Governmental Program Analyst

cc: State Clearinghouse

JUL 24 2019

Anthea Hansen
General Manager
Del Puerto Water District
17840 Ward Avenue
Patterson, CA, 95363

Project: Notice of Preparation of a Draft Environmental Impact Report for the Del Puerto Canyon Reservoir Project

District CEQA Reference No: 20190867

Dear Ms. Hansen:

The San Joaquin Valley Unified Air Pollution Control District (District) has reviewed the Notice of Preparation (NOP) for the Del Puerto Canyon Reservoir Project. The proposed project consists of construction of a reservoir located on Del Puerto Creek in the foothills of the Coast Range Mountains west of Patterson, California and Interstate-5 (Project). The District offers the following comments:

Emissions Analysis

1) At the federal level for the National Ambient Air Quality Standards (NAAQS), the District is currently designated as extreme nonattainment for the 8-hour ozone standards; nonattainment for the PM2.5 standards; and attainment for the 1-Hour ozone, PM10 and CO standards. At the state level, the District is currently designated as nonattainment for the 8-hour ozone, PM10, and PM2.5 California Ambient Air Quality Standards (CAAQS). The District recommends that the Air Quality section of an Environmental Impact Report (EIR) include a discussion of the following impacts:

   a) **Criteria Pollutants:** Project related criteria pollutant emissions should be identified and quantified. The discussion should include existing and post-project emissions.

      i) Construction Emissions: Construction emissions are short-term emissions and should be evaluated separately from operational emissions. For reference, the District's annual criteria thresholds of significance for construction are: 100 tons per year of carbon monoxide (CO), 10 tons per year of oxides of nitrogen (NOx), 10 tons per year of reactive organic gases (ROG), 27 tons per year of oxides of sulfur (SOx), 15 tons per year of particulate matter of 10 microns or less in size (PM10), or 15 tons per year of particulate matter of 2.5 microns or less in size (PM2.5).

- *Recommended Mitigation Measure if needed:* To reduce impacts from construction related exhaust emissions, the District recommends feasible mitigation for the project to utilize off-road construction fleets that can achieve fleet average emissions equal to or cleaner than the Tier III emission standards, as set forth in §2423 of Title 13 of the California Code of Regulations, and Part 89 of Title 40 Code of Federal Regulations. This can be achieved through any combination of uncontrolled engines and engines complying with Tier III and above engine standards.

ii) Operational Emissions: Permitted (stationary sources) and non-permitted (mobile sources) sources should be analyzed separately. For reference, the annual criteria thresholds of significance for operation of permitted and non-permitted sources each are: 100 tons per year of carbon monoxide (CO), 10 tons per year of oxides of nitrogen (NOx), 10 tons per year of reactive organic gases (ROG), 27 tons per year of oxides of sulfur (SOx), 15 tons per year of particulate matter of 10 microns or less in size (PM10), or 15 tons per year of particulate matter of 2.5 microns or less in size (PM2.5).

- *Recommended Mitigation Measure if needed:* Project related impacts on air quality can be reduced through incorporation of design elements, for example, that increase energy efficiency, reduce vehicle miles traveled, and reduce construction exhaust related emissions.

iii) Recommended Model: Project related criteria pollutant emissions from construction and operation non-permitted (limited to equipment not subject to District permits) should be identified and quantified. Emissions analysis should be performed using CalEEMod (**Cal**ifornia **E**mission **E**stimator **Mod**el), which uses the most recent approved version of relevant Air Resources Board (ARB) emissions models and emission factors. CalEEMod is available to the public and can be downloaded from the CalEEMod website at: www.caleemod.com.

iv) The project may have a significant impact on air quality. As such, the District recommends the EIR also include a discussion on the feasibility of implementing a Voluntary Emission Reduction Agreement (VERA) for this project. A VERA is a mitigation measure by which the project proponent provides pound-for-pound mitigation of emissions increases through a process that develops, funds, and implements emission reduction projects, with the

District serving a role of administrator of the emissions reduction projects and verifier of the successful mitigation effort. To implement a VERA, the project proponent and the District enter into a contractual agreement in which the project proponent agrees to mitigate project specific emissions by providing funds for the District's incentives programs). The funds are disbursed by the District in the form of grants for projects that achieve emission reductions. Thus, project specific impacts on air quality can be fully mitigated. Types of emission reduction projects that have been funded in the past include electrification of stationary internal combustion engines (such as agricultural irrigation pumps), replacing old heavy-duty trucks with new, cleaner, more efficient heavy-duty trucks, and replacement of old farm tractors.

In implementing a VERA, the District verifies the actual emission reductions that have been achieved as a result of completed grant contracts, monitors the emission reduction projects, and ensures the enforceability of achieved reductions. After the project is mitigated, the District certifies to the lead agency that the mitigation is completed, providing the lead agency with an enforceable mitigation measure demonstrating that project specific emissions have been mitigated to less than significant. To assist the Lead Agency and project proponent in ensuring that the environmental document is compliant with CEQA, the District recommends the environmental document includes an assessment of the feasibility of implementing a VERA.

b) **Nuisance Odors:** The Project should be evaluated to determine the likelihood that the Project would result in nuisance odors. Nuisance orders are subjective, thus the District has not established thresholds of significance for nuisance odors. Nuisance odors may be assessed qualitatively taking into consideration of Project design elements and proximity to off-site receptors that potentially would be exposed objectionable odors.

c) **Health Risk Screening/Assessment:** A Health Risk Screening/Assessment identifies potential Toxic Air Contaminants (TAC's) impact on surrounding sensitive receptors such as hospitals, daycare centers, schools, work-sites, and residences. TAC's are air pollutants identified by the Office of Environmental Health Hazard Assessment/California Air Resources Board (OEHHA/CARB) (https://www.arb.ca.gov/toxics/healthval/healthval.htm) that pose a present or potential hazard to human health. A common source of TACs can be attributed to diesel exhaust emitted from both mobile and stationary sources. Industry specific TACs generated must also be identified and quantified.

The District recommends the Project be evaluated for potential health impacts to surrounding receptors (on-site and off-site) resulting from operational and multi-year construction TAC emissions.

i) The District recommends conducting a screening analysis that includes all sources of emissions. A screening analysis is used to identify projects which may have a significant health impact. A prioritization, using CAPCOA's updated methodology, is the recommended screening method. A prioritization score of 10 or greater is considered to be significant and a refined Health Risk Assessment (HRA) should be performed. The prioritization calculator can be found at: http:www.valleyair.org/busind/pto/emission_factors/Criteria/Toxics/Utilities/PRIORITIZATION%20RMR%202016.XLS.

ii) The District recommends a refined HRA for projects that result in a prioritization score of 10 or greater. It is recommended that the Project proponent contact the District to review the proposed modeling protocol. The Project would be considered to have a significant health risk if the HRA demonstrates that the Project related health impacts would exceed the Districts significance threshold of 20 in a million for carcinogenic risk and 1.0 for the Acute and Chronic Hazard Indices.

Please provide the following information electronically to the District for review:

- HRA AERMOD model files
- HARP2 files
- Summary of emissions source locations, emissions rates, and emission factor calculations and methodology.

More information on toxic emission factors, prioritizations and HRAs can be obtained by:

- E-Mailing inquiries to: hramodeler@valleyair.org; or
- The District can be contacted at (559) 230-6000 for assistance; or
- Visiting the Districts website (Modeling Guidance) at http://www.valleyair.org/busind/pto/Tox_Resources/AirQualityMonitoring.htm

d) **Ambient Air Quality Analysis:** An ambient air quality analysis (AAQA) uses air dispersion modeling to determine if emissions increases from a project will cause or contribute to a violation of the ambient air quality standards. The District recommends that an AAQA be performed for the Project if emissions exceed 100 pounds per day of any pollutant.

If an AAQA is performed, the analysis should include emissions from both Project specific permitted and non-permitted equipment and activities. The District recommends consultation with District staff to determine the appropriate model and input data to use in the analysis. Specific information for assessing significance, including screening tools and modeling guidance is available online at the District's website www.valleyair.org/ceqa.

2) In addition to the discussions on potential impacts identified above, if preliminary review indicates that an EIR should be prepared, the District recommends the EIR also include the following discussions:

   a) A discussion of the methodology, model assumptions, inputs and results used in characterizing the Project's impact on air quality. To comply with CEQA requirements for full disclosure, the District recommends that the modeling outputs be provided as appendices to the EIR. The District further recommends that the District be provided with an electronic copy of all input and output files for all modeling.

   b) A discussion of the components and phases of the Project and the associated emission projections, including ongoing emissions from each previous phase.

   c) A discussion of Project design elements and mitigation measures, including characterization of the effectiveness of each mitigation measure incorporated into the Project.

   d) A discussion of whether the Project would result in a cumulatively considerable net increase of any criteria pollutant or precursor for which the San Joaquin Valley Air Basin is in non-attainment. More information on the District's attainment status can be found online by visiting the District's website at: http://valleyair.org/aqinfo/attainment.htm.

District Rules and Regulations

3) District Rule 9510 (Indirect Source Review) is intended to mitigate a project's impact on air quality through project design elements or by payment of applicable off-site fees. The proposed Project is subject to District Rule 9510 if (1) it has or will receive a project-level discretionary approval from a public agency and will equal or exceed 9,000 square feet of other space, or (2) if it has or will receive a project-level approval from a public agency and will equal or exceed 45,000 square feet of other space. If subject to the rule, an Air Impact Assessment (AIA) application is required prior to applying for project-level approval from a public agency. In this case, if not already

done, please inform the project proponent to immediately submit an AIA application to the District to comply with District Rule 9510.

In the case the Project is subject to District Rule 9510 an AIA application is required and the District recommends that demonstration of compliance with District Rule 9510, before issuance of the first building permit, be made a condition of Project approval. Information about how to comply with District Rule 9510 can be found online at: http://www.valleyair.org/ISR/ISRHome.htm. The AIA application form can be found online at: http://www.valleyair.org/ISR/ISRFormsAndApplications.htm.

4) The above list of rules is neither exhaustive nor exclusive. To identify other District rules or regulations that apply to this Project or to obtain information about District permit requirements, the applicant is strongly encouraged to contact the District's Small Business Assistance (SBA) Office at (559) 230-5888. Current District rules can be found online at the District's website at: www.valleyair.org/rules/1ruleslist.htm.

The District recommends that a copy of the District's comments be provided to the Project proponent. If you have any questions or require further information, please call Eric McLaughlin at (559) 230-5808.

Sincerely,

Arnaud Marjollet
Director of Permit Services

for Brian Clements
Program Manager

AM: em

STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY **GAVIN NEWSOM**, *Governor*

DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791

JUL 23 2019

Governor's Office of Planning & Research

JULY 24 2019

STATE CLEARINGHOUSE

Ms. Anthea Hansen
Del Puerto Water District
17840 Ward Avenue
Patterson, California 95363

SCH #2019060254: Del Puerto Canyon Reservoir
Stanislaus County

The Division of Safety of Dams (DSOD) has reviewed the documents for the above referenced project, which describes the proposed construction of a new dam and reservoir in Del Puerto Canyon, west of I-5 and the city of Patterson in Stanislaus County. The dam described in the project documents would have a reservoir storage capacity of approximately 85,000 acre-feet and would therefore be subject to State jurisdiction for safety.

As defined in Division 3, Part 1, Chapter 1, Sections 6002 and 6003, of the California Water Code, dams 25 feet or higher with a storage capacity of more than 15 acre-feet, and dams higher than 6 feet with a storage capacity of 50 acre-feet or more are subject to State jurisdiction. Dam height is defined as the vertical distance measured from the maximum possible water storage elevation to the downstream toe of the barrier.

Since the proposed dam and reservoir will be subject to State jurisdiction, a construction application, together with plans, specifications, and the appropriate filing fee must be filed with DSOD. All dam safety related issues must be resolved prior to approval of the application, and work must be performed under the direction of a Civil Engineer registered in California. Erik Malvick, our Design Engineering Branch Chief, is responsible for the application process and can be reached at (916) 565-7840.

If you have any questions or need additional information, you may contact Area Engineer Austin Roundtree at (916) 565-7822 or me at (916) 565-7820.

Sincerely,

Melissa Collord

Melissa S. Collord, Regional Engineer
Central Region
Field Engineering Branch
Division of Safety of Dams

cc: Governor's Office of Planning and Research
State Clearinghouse
state.clearinghouse@opr.ca.gov

STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY

GAVIN NEWSOM, *Governor*

DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791

VIA EMAIL

July 25, 2019

Anthea Hansen, General Manager
Del Puerto Water District
17840 Ward Avenue/P.O. Box 1596
Patterson, CA 95363
ahansen@delpuertowd.org

RE: Review of Notice of Preparation (NOP) and Initial Study (IS) for
Del Puerto Canyon Reservoir, Stanislaus County, California
Prepared by Del Puerto Water District
(State Clearinghouse # 2019060254)

Dear Ms. Hansen,

The California Department of Water Resources (DWR) staff have reviewed the Del Puerto Water District's NOP and IS for the proposed Del Puerto Canyon Reservoir (Project) in the Stanislaus County, California. Following includes our initial comments regarding the Project:

Encroachment Permits
An encroachment permit must be obtained for work within, under or over California Aqueduct (Aqueduct) right-of-way. The Project would include several utility crossings (raw water pipeline(s), electrical transmission lines, and communication cables) through Aqueduct right-of-way. In order to maintain the integrity of the Aqueduct, the lead agency will need to monitor and provide necessary mitigation measures to the segments of the Aqueduct subject to the encroachment permit.

Potential Effects on Hydrology and Water Quality
Del Puerto Creek (DPR) is a tributary of the San Joaquin River (SJR) thence drains into the Delta. Any flow changes of DPR could affect conditions of the SJR. DWR requests a detailed description of the Project operations (including the coordination with the Delta-Mendota Canal (DMC) and the San Luis Reservoir) and thorough analyses of potential effects on hydrology and water quality under normal operations and emergency release, which could impact operations of SWP and the Central Valley Project (CVP).

Water Rights
The NOP indicates that the Project will provide additional south of the Delta storage, utilizing exported water from Delta through DMC to optimize use and benefit of existing water supplies. However, the NOP does not specify any water rights information regarding the sources of water. Such water rights information is critical to evaluate potential injury to other legal water users. Presumably the water stored in the proposed reservoir will be CVP water supply, under the U.S. Bureau of Reclamation's (Reclamation) water rights permits, or other transfer water conveyed

through CVP facilities. Given the existing coordinated operations between DWR and Reclamation to convey water through the Delta for export and to meet regulatory requirements, the EIR should address potential effects of SWP operations and water supplies.

Since all dams and reservoirs in California are under jurisdiction of DWR Division of Safety of Dams, please expect a separate letter from them.

DWR requests copies of any subsequent environmental documentation related to the Project, including but not limited to any CEQA documents and all legal notices prepared by your district and other partners. Please send future correspondence and questions to:

Nancy Finch, Senior Staff Counsel
Office of the Chief Counsel
Department of Water Resources
1416 Ninth Street, Room 1118
Sacramento, California 94236-0001
(916) 653-6840

Sincerely,

Pedro Villalobos
Chief, State Water Project Analysis Office

STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY

GAVIN NEWSOM, Governor

DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-
0001 (916) 653-5791

AUG 29 19
1:2

August 22, 2019

Ms. Anthea Hansen
Del Puerto Water District
Post Office Box 1596
Patterson, California 95363

SCH# 2019060254, Del Puerto Canyon Reservoir, Notice of Preparation (NOP), California Aqueduct, Stanislaus County

Dear Ms. Hansen;

The California Department of Water Resources (DWR) has submitted a comment letter on the proposed Del Puerto Canyon Reservoir project. DWR did not include specific information regarding the proposed project's potential encroachments onto DWR's-right-of-way. As we discussed, the information is important to the project's design and CEQA processes. For that reason, this letter includes additional information to inform those processes.

Portions of the proposed project have the potential to impact DWR's right-of-way and could impact the integrity of the California Aqueduct downslope of the proposed reservoir. The project, as described, would include several utility crossings (raw water pipeline(s), electrical transmission lines, communication cables, etc.) within DWR's right-of-way for the Aqueduct. These utility crossings through the Aqueduct right-of-way will require an encroachment permit issued by DWR. In addition, the 16-foot diameter culvert under the Aqueduct at Del Puerto Creek (Aqueduct Milepost 37.21) is the only cross-drainage feature channeling drainage from the west across DWR right-of-way for approximately 6 linear miles of the Aqueduct alignment. Any emergency releases from the proposed reservoir, or releases in excess of normal run-off in Del Puerto Creek, would have to flow first under Interstate 5 and then through the DWR culvert. The hydrology study for the proposed reservoir should include an assessment of potential impacts to the downstream watershed.

If you have any questions about these comments or the process to obtain written authorization from DWR, you may contact Leroy Ellinghouse at (916) 653-7168.

Please send other subsequent environmental documentation or correspondence to me at:

Nancy Finch, Senior Counsel
Office of the Chief Counsel
Department of Water Resources
1416 Ninth Street, Room 1118
Sacramento, California 95814
(916) 653-6840

Sincerely,

Nancy Finch
Senior Counsel,

California
Department of Conservation
Division of Oil, Gas, and Geothermal Resources

Gavin Newsom, Governor
David Bunn, Director

June 25, 2019

Ms. Anthea Hansen
ahansen@delpuertowd.org
Del Puerto Water District
17840 Ward Avenue/P.O. Box 1596
Patterson, CA 95363

CEQA Project: **SCH #2019060254**
Lead Agency: **Del Puerto Water District**
Project Title: **Del Puerto Canyon Reservoir Project**

The Division of Oil, Gas, and Geothermal Resources (DOGGR) oversees the drilling, operation, maintenance, and plugging and abandonment of oil, natural gas, and geothermal wells. Our regulatory program emphasizes the wise development of oil, natural gas, and geothermal resources in the state through sound engineering practices that protect the environment, prevent pollution, and ensure public safety. Northern California is known for its rich gas fields. Division staff have reviewed the documents depicting the proposed project.

The Del Puerto Canyon Reservoir Project includes construction of a dam and inundation of Del Puerto Canyon and west of Interstate Highway 5 west of Patterson. The attached map shows locations of seven known abandoned dry holes within the project area. Based on the Project map submitted by the Del Puerto Water District, four wells appear to be located within the inundation zone, two are outside the proposed reservoir south and east of the proposed dam, and one is upstream of the proposed inundation zone. One well, Shell Western Exploration and Production Inc. Elfers 36X-28, is close to one of the proposed saddle dams. That well should be verified to be outside of proposed construction prior to disturbing soil in that area.

Note that DOGGR has not verified the actual location of the wells nor does it make specific statements regarding the adequacy of abandonment procedures with respect to current standards. The developer is advised to verify the locations of all wells where development is expected to disturb the soil above the wells and to mark or note the accurate locations for future reference. For wells in roadways especially care should be taken to route utilities around the wells.

For future reference, you can review wells located on private and public land at DOGGR's website: https://maps.conservation.ca.gov/doggr/wellfinder/#close.

The local permitting agencies and property owner should be aware of, and fully understand, that significant and potentially dangerous issues may be associated with development near oil and gas wells. These issues are non-exhaustively identified in the following comments and are provided by DOGGR for consideration by the local permitting agency, in conjunction with the property owner and/or developer, on a parcel-by-parcel or well-by-well basis. As stated above, DOGGR provides the above well review information solely to facilitate decisions made by the local permitting agency regarding potential development near a gas well.

1. It is recommended that access to a well located on the property be maintained in the event re-abandonment of the well becomes necessary in the future. Impeding access to a well could result in the need to remove any structure or obstacle that prevents or impedes access. This includes, but is not limited to, buildings, housing, fencing, landscaping, trees, pools, patios, sidewalks, and decking.

2. Nothing guarantees that a well abandoned to current standards will not start leaking oil, gas, and/or water in the future. It always remains a possibility that any well may start to leak oil, gas, and/or water after abandonment, no matter how thoroughly the well was plugged and abandoned. DOGGR acknowledges that wells abandoned to current standards have a lower probability of leaking oil, gas, and/or water in the future, but makes no guarantees as to the adequacy of this well's abandonment or the potential need for future re-abandonment.

3. Based on comments **1** and **2** above, DOGGR makes the following general recommendations:
   a. Maintain physical access to any gas well encountered.
   b. Ensure that the abandonment of gas wells is to current standards.

   If the local permitting agency, property owner, and/or developer chooses not to follow recommendation "**b**" for a well located on the development site property, the Division believes that the importance of following recommendation "**a**" for the well located on the subject property increases. If recommendation "**a**" cannot be followed for the well located on the subject property, then the Division advises the local permitting agency, property owner, and/or developer to consider any and all alternatives to proposed construction or development on the site (see comment **4** below).

4. Sections 3208 and 3255(a)(3) of the Public Resources Code give DOGGR the authority to order the re-abandonment of any well that is hazardous, or that poses a danger to life, health, or natural resources. Responsibility for re-abandonment costs for any well may be affected by the choices made by the local permitting agency, property owner, and/or developer in considering the general recommendations set forth in this letter. (Cal. Public Res. Code, § 3208.1.)

5. Maintaining sufficient access to a gas well may be generally described as maintaining "rig access" to the well. Rig access allows a well servicing rig and associated necessary equipment to reach the well from a public street or access way, solely over the parcel on which the well is located. A well servicing rig, and any necessary equipment, should be able to pass unimpeded along and over the route, and should be able to access the well without disturbing the integrity of surrounding infrastructure.

6. If, during the course of development of this proposed project, any unknown well(s) is/are discovered, DOGGR should be notified immediately so that the

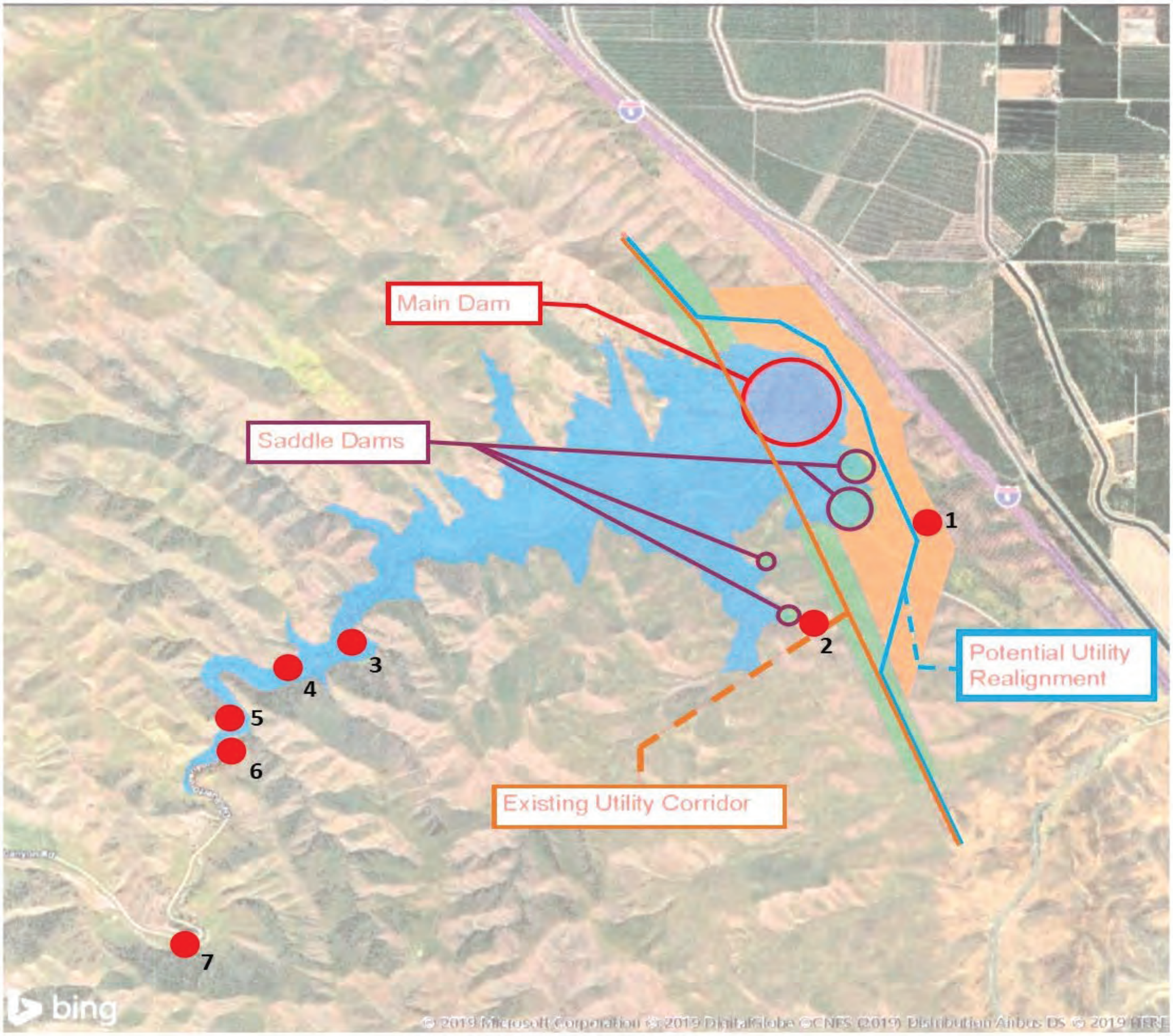
newly-discovered well(s) can be incorporated into the records and investigated. DOGGR recommends that any wells found in the course of this project, and any pertinent information obtained after the issuance of this letter, be communicated to the appropriate county recorder for inclusion in the title information of the subject real property. This is to ensure that present and future property owners are aware of (1) the wells located on the property, and (2) potentially significant issues associated with any improvements near oil or gas wells.

No well work may be performed on any oil or gas well without written approval from DOGGR in the form of an appropriate permit. This includes, but is not limited to, mitigating leaking fluids or gas from abandoned wells, modifications to well casings, and/or any other re-abandonment work. (NOTE: DOGGR regulates the depth of any well below final grade (depth below the surface of the ground). Title 14, Section 1723.5 of the California Code of Regulations states that all well casings shall be cut off at least 5 feet but no more than 10 feet below grade. If any well needs to be lowered or raised (i.e. casing cut down or casing riser added) to meet this grade regulation, a permit from DOGGR is required before work can start.)

Sincerely,

Jerry Salera
Senior Oil and Gas Engineer (Supervisor)

Attachments: Map



DRY HOLES IN PROJECT AREA

MAP #	API #	Operator	Well Name	Depth	Year Drilled
1	09920018	Phillips Petroleum	Hanson B-1	7121'	1975
2	09900050	Shell Western E&P	Elfers 36X-28	4993'	1952
3	09920035	Senate Res., Inc.	Senate Res. #6	505'	1981
4	09920034	Senate Res., Inc.	Senate Res. #5	960'	1981
5	09900049	Luard Corp.	Luard Valerdi #1	120'	1961
6	09920033	Senate Res., Inc.	Senate Res. #4	520'	1981
7	09900059	Martin Shurin, Jr.	Martin Shurin #1	3082'	1961

Dry hole

NORTH

1 Mile

LOCATIONS OF AFFECTED WELLS
Del Puerto Canyon Reservoir Project
Stanislaus County, California
SCH #2019060254

Stanislaus County

CHIEF EXECUTIVE OFFICE
JUL 29 19
Jody L. Hayes
Chief Executive Officer

Patricia Hill Thomas
Chief Operations Officer/
Assistant Executive Officer

Keith D. Boggs
Assistant Executive Officer

Patrice M. Dietrich
Assistant Executive Officer

STANISLAUS COUNTY ENVIRONMENTAL REVIEW COMMITTEE

July 25, 2019

Anthea Hansen, General Manager
Del Puerto Water District
117840 Ward Avenue
PO Box 1596
Patterson, CA 95363

SUBJECT: ENVIRONMENTAL REFERRAL – DEL PUERTO WATER DISTRICT – DEL PUERTO CANYON RESERVOIR PROJECT – NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL IMPACT REPORT

Ms. Hansen:

Thank you for the opportunity to review the above-referenced project.

The Stanislaus County Environmental Review Committee (ERC) has reviewed the subject project and provides the following comments:

Recreational Activities

Please clarify in the Project Description whether the reservoir will be used for recreational activities, and if so please include whether body-to-water contact will be allowed, if events with amplified sound will be allowed, and if there will be food facilities.

The ERC appreciates the opportunity to comment on this project.

Sincerely,

Patrick Cavanah

Patrick Cavanah, Sr. Management Consultant
Environmental Review Committee

PC:ss

cc: ERC Members

Del Puerto WATER District

DEL PUERTO CANYON
RESERVOIR

EIR SCOPING MEETING — COMMENT CARD

The Del Puerto Water District (DPWD), in partnership with the San Joaquin River Exchange Contractors Water Authority is preparing an Environmental Impact Report in accordance with the California Environmental Quality Act.

Please provide your written comments to the mailing address on the back.
Or e-mail ahansen@delpuertowd.org

DPWD must receive all comments by: Monday, July 29, 2019. Thank you.

I feel misled by the advertising of this "meeting." This was nothing more than a gallery-walk of information that I can find online. When is someone giving a presentation and taking questions from the audience?

Sheila Cornwell
748 Orange Ave
Patterson, Ca 95363

Del Puerto WATER District

DEL PUERTO CANYON RESERVOIR

EIR SCOPING MEETING — COMMENT CARD

The Del Puerto Water District (DPWD), in partnership with the San Joaquin River Exchange Contractors Water Authority is preparing an Environmental Impact Report in accordance with the California Environmental Quality Act.

Please provide your written comments to the mailing address on the back.
Or e-mail ahansen@delpuertowd.org

DPWD must receive all comments by: Monday, July 29, 2019. Thank you.

(PLEASE PRINT CLEARLY)

This is not a good idea. The amount of water that could come from this project does not outweigh the immense natural gem that we have in Del Puerto Canyon, especially the gateway entrance which will be destroyed in order to build the dam.

Del Puerto WATER District

DEL PUERTO CANYON RESERVOIR

EIR SCOPING MEETING — COMMENT CARD

The Del Puerto Water District (DPWD), in partnership with the San Joaquin River Exchange Contractors Water Authority is preparing an Environmental Impact Report in accordance with the California Environmental Quality Act.

Please provide your written comments to the mailing address on the back.
Or e-mail ahansen@delpuertowd.org

DPWD must receive all comments by: Monday, July 29, 2019. Thank you.

(PLEASE PRINT CLEARLY)

The canyon is a beautiful place. And
the "benefits" don't seem very clear.
The "meeting" didn't do anything to
clear up any details or opportunity
to voice concern. I come to ~~go~~ Patterson
for the canyon. I wont for the
~~[illegible]~~ "reservior"

Del Puerto WATER District

DEL PUERTO CANYON
RESERVOIR

EIR SCOPING MEETING — COMMENT CARD

The Del Puerto Water District (DPWD), in partnership with the San Joaquin River Exchange Contractors Water Authority is preparing an Environmental Impact Report in accordance with the California Environmental Quality Act.

Please provide your written comments to the mailing address on the back.
Or e-mail ahansen@delpuertowd.org

DPWD must receive all comments by: Monday, July 29, 2019. Thank you.

(PLEASE PRINT CLEARLY)

The project benefits are very vague and dont seem to outway the impact the land currently has. It is a beautiful sacred place that will be impacted environmentally in a way that will destroy the natural wildlife and organic landscape. People from all around come to experience this very special place which brings people to your community on a regular basis.

This meeting was not as informative as I had hoped. Nothing was clearly communicated and there was no opportunity for concerns to be heard

From:	Anthea Hansen
To:	David Froba
Cc:	Robin Cort
Subject:	RE: DPC Reservoir
Date:	Friday, July 26, 2019 10:44:39 AM

Mr. Froba,

Your comments have been duly received. We will add you to our notice list.

Sincerely,
Anthea

Anthea G. Hansen
General Manager
Del Puerto Water District
PH 209-892-4470/FAX 209-892-4469

-----Original Message-----
From: David Froba [mailto:froba@comcast.net]
Sent: Friday, July 26, 2019 10:40 AM
To: Anthea Hansen <ahansen@delpuertowd.org>
Subject: DPC Reservoir

Ms. Hansen-

I am writing as a private individual and as an officer of Stanislaus Audubon Society, an organization whose mission is the preservation and conservation of birds and wildlife in Stanislaus and Merced counties.

First, I am making a request for notice of all meetings and actions on this project pursuant to CEQA. Please use this email address.

Second, DPC forms a limited habitat for birds and other wildlife and we wish to be assured that it is not adversely affected. Of particular concern is a rare but regular avian visitor, the Grasshopper Sparrow. It is seldom seen anywhere in the county other than precisely where the reservoir is being proposed.

Third, DPC Road currently provides access to this limited habitat. We wish to be assured that this access remains, together with safe and numerous pul-out spaces for vehicles. Besides birding, the road offers access to other scientific and recreational users coming from both the Valley and the Bay Area. We wish to be assured that this access not be curtailed, and hopefully even improved.

Repectfully,

David Froba

Sent from my iPad

From: Anthea Hansen
To: Sandra Watts; Robin Cort
Subject: Fwd: Del Puerto Canyon Reservoir project public comment
Date: Saturday, July 27, 2019 5:26:58 PM

Sent from my Verizon, Samsung Galaxy smartphone

-------- Original message --------
From: Mercedes Martinez <mercy146@yahoo.com>
Date: 7/26/19 5:26 PM (GMT-08:00)
To: Anthea Hansen <ahansen@delpuertowd.org>
Subject: Del Puerto Canyon Reservoir project public comment

To:

Anthea Hansen,
General Manager
Del Puerto Water District, 17840 Ward Avenue, Patterson, CA 95363, Del Puerto Canyon Reservoir project website: https://www.delpuertocanyonreservoir.com/

As a resident & home owner of Patterson Ca, I would like the Del Puerto Canyon Reservoir project to include recreational areas for our community. I would like the community to be able to swim, boat, jet ski, camp, hike, picnic, etc along this proposed site. Please add these recreational aspects into your Del Puerto Canyon Reservoir project plan.

Sincerely,

Sean Hansen
Resident & Home Owner, Patterson Ca

Sent from Yahoo Mail on Android

From:	Anthea Hansen
To:	Robin Cort; Sandra Watts
Subject:	Fwd: Public Review and Comment on DPC Reservoir Project
Date:	Saturday, July 27, 2019 5:27:00 PM

Sent from my Verizon, Samsung Galaxy smartphone

-------- Original message --------
From: Barbara and Sal Salerno <bees2@sbcglobal.net>
Date: 7/27/19 1:55 PM (GMT-08:00)
To: Anthea Hansen <ahansen@delpuertowd.org>
Subject: Public Review and Comment on DPC Reservoir Project

To Ms. Hansen, General Manager,

Del Puerto Water District

I have a keen interest in the upcoming preparations of an Environmental Impact Report for the Del Puerto Canyon Reservoir, both as a community member and as the president of Stanislaus Audubon Society. Please put my email address on a list of those interested parties in this project, with particular respect to the CEQA requirements.

It is too early to determine the environmental impacts of this project, but I hope that CEQA is followed with diligence and not in a rushed manner. With regards to the suggested alternate routes, members of our local chapter would likely recommend the route that most closely aligns along with the proposed dam. This route would afford the best opportunities for bicycling, birdwatching, and other recreational opportunities all the way up to Frank Raines Park.

I will be looking forward to further notices about this project.

Sincerely,

Salvatore Salerno

From:	Anthea Hansen
To:	Sandra Watts; Robin Cort
Subject:	Fwd: Del Puerto Canyon Reservoir
Date:	Saturday, July 27, 2019 5:27:00 PM

Sent from my Verizon, Samsung Galaxy smartphone

-------- Original message --------
From: Chris Stovall <cstovall52f1@comcast.net>
Date: 7/27/19 12:03 PM (GMT-08:00)
To: Anthea Hansen <ahansen@delpuertowd.org>
Cc: berryhillt@stancounty.com, WithrowT@StanCounty.com, olsenk@stancounty.com, demartiniJ@stancounty.com, vito.chiesa@stancounty.com
Subject: Del Puerto Canyon Reservoir

Dear Mrs. Hansen

I'm writing to you in regards to the Public Comment review for the Del Puerto Canyon Reservoir. I have two areas of concern that I feel should be addressed.

1. Who would be the ultimate approval agency in regards to providing oversight as to whether or not the project is structurally sound, appropriate for the soils found on site, and safe? This project is far and away over the heads of the people who run the city of Patterson. The city has invited major corporations to this city and has either chosen to ignore the traffic impact studies given to them or didn't understand what they were reading. Either way this project is far too complex for their level of competence. I would ask that the City of Patterson NOT be the final authority approving plans for this project in regards to the structural adequacy of this project.

2. While I completely understand the needs of the Farmers for wanting this project, there are other areas of concern that this region suffers from that should be addressed and rolled into the EIR study for this project. As I'm sure you know the Altamont Pass is massively undersized for the amount of traffic it sees on a regular basis. This area needs another freeway connecting it to the Bay Area. I would ask that as part of the approval of this project the EIR and final sign off of this project also include at the very least a study to find out the feasibility of building a freeway along the same road that will include this reservoir and terminating at 680 in the Bay Area. The Farmers will get the much needed private water storage they desire, people in the Bay Area will have faster access to 1-5, and the rest of the Stanislaus Region will gain much needed traffic relief and improved quality of life. This would be a Win Win for everyone.

Chris Stovall
Patterson CA

From:	Anthea Hansen
To:	Robin Cort; Sandra Watts
Subject:	Fwd: Del Puerto Reservoir Public Scoping
Date:	Saturday, July 27, 2019 5:27:01 PM

Sent from my Verizon, Samsung Galaxy smartphone

-------- Original message --------
From: Shivaugn Alves <shivaugnmaureen@gmail.com>
Date: 7/27/19 3:03 PM (GMT-08:00)
To: Anthea Hansen <ahansen@delpuertowd.org>
Subject: Del Puerto Reservoir Public Scoping

Greetings Anthea,

Please accept this email to serve as my scoping comment regarding the proposed Del Puerto Canyon Reservoir.

I would like to begin by sharing my appreciation for all of your efforts (and successes) obtaining essential water to the West Side- our farms and region are better served because of what you do.

There are some concerns that I and others would like to see addressed in future planning of the project:

1) The canyon area serves the Patterson community by providing nature respite, in addition to providing cultural and historical significance. The reservoir would eliminate the portion of the creek that many folks have come to enjoy.

How could the project, if passed, include a recreation component for the loss that our community will have? Opportunities for hiking, mountain biking, fishing or paddling would show good will towards our community that the water is for more than farming alone, but an opportunity to enrich quality of life.

2) Native American tribes and even dinosaurs once called the canyon home. Artifacts remain to this day, and would be destroyed by the reservoir.

What steps would be taken to preserve these items and provide educational opportunity to the canyon’s historical significance for our community’s people?

3) Pumps will be necessary to move water in the reservoir. Gas pumps are heavy emitters of air pollution. Our region is rates within the worst in air pollution in the nation. In our region one in five children suffer from asthma and one thousand people each year die from air quality related health issues.

What efforts are being made to install pumps that use renewable energy technology such as solar?

The above three concerns are in addition to the most pressing concern: that the most stringent planning, technology and tests are being conducted to protect from a flood.

If the community is to bare the burden of the dam, then we would hope to see something positive come from it as well.

100+ others have signed a petition stating a similar sentiment. We created the petition as a another form to provide public comment since most of the community was unaware until five days before comment was due. Please accept.
You will find the link here:

http://chng.it/mQxRjgVhhM

Thank you for the consideration

--
Shivaugn M. Alves

Assessment & Accountability, PJUSD
Co-Founder, Patterson Progressive Alliance
209.605.6716/209.895.7711

From: Anthea Hansen
To: Sandra Watts; Robin Cort
Subject: Fwd: Del Puerto Canyon Reservoir Public Comment
Date: Saturday, July 27, 2019 5:27:05 PM

Sent from my Verizon, Samsung Galaxy smartphone

-------- Original message --------
From: Monica Della Maggiore <monicadellamaggiore@gmail.com>
Date: 7/27/19 8:44 AM (GMT-08:00)
To: Anthea Hansen <ahansen@delpuertowd.org>
Subject: Del Puerto Canyon Reservoir Public Comment

Dear Ms Hansen
As a resident of Patterson, I am requesting a recreation aspect be added to the canyon reservoir project.
Not only will recreation benefit our residents, but also the city in increased tourism.

Thank you
Monica Della Maggiore

Sent from my iPhone

From:	Anthea Hansen
To:	Robin Cort; Sandra Watts
Subject:	Fwd: Re; Del Puerto Canyon Reservoir Project
Date:	Saturday, July 27, 2019 5:55:26 PM

Sent from my Verizon, Samsung Galaxy smartphone

-------- Original message --------
From: Debra Cervantes <cervantesdebra@yahoo.com>
Date: 7/27/19 5:09 PM (GMT-08:00)
To: Anthea Hansen <ahansen@delpuertowd.org>
Subject: Re; Del Puerto Canyon Reservoir Project

I am a current Patterson resident for the last 7 years and was excited to hear about the proposed reservoir project, until I realized it did not include recreational use. I am writing in regards to the plans in hopes to have recreational use included in the plans for this reservoir as I am sure it would really benefit the Patterson community to have swimming with a beach, boating, and hiking trails to use.   It seems unfair that with this current project we are all subject to flooding and will be required to purchase flood insurance and not even get any positive use out of this proposed reservoir! Patterson residents are in desperate need of some activities for our community! We pay so much money in taxes and bonds and Mello Roos yet we have to travel a min of 30-40 for recreational activities. It’s time for these plans to start helping benefit our entire community!

Sincerely,

Debra Cervantes

Sent from Yahoo Mail for iPhone

From:	Anthea Hansen
To:	Sandra Watts; Robin Cort
Subject:	Fwd: Del Puerto Reservoir Comment
Date:	Sunday, July 28, 2019 11:57:00 AM

Sent from my Verizon, Samsung Galaxy smartphone

-------- Original message --------
From: Rhonda Allen <rhondasaddress@sbcglobal.net>
Date: 7/28/19 7:36 AM (GMT-08:00)
To: Anthea Hansen <ahansen@delpuertowd.org>
Subject: Del Puerto Reservoir Comment

I have learned that a study is being done to consider placing a reservoir through the Del Puerto Canyon. I am against this proposal due to
the large number of birds who live in and migrate through this area. It is a haven for many birds that we do not see in other parts of the county. I hope an in depth accounting of this is done. We need these natural areas to sustain wildlife. Just down the road is San Luis Reservoir
which has a capacity that is never full. I hope we keep our eyes on the best conservation practices and not on quick fixes that overlook the health of our environment.
Thank you.
Rhonda Allen
Stanislaus County resident

Sent from my iPhone

From:	Anthea Hansen
To:	Robin Cort; Sandra Watts
Subject:	Fwd: Comment on EIR scoping for Del Puerto Canyon dam
Date:	Sunday, July 28, 2019 11:58:43 AM

Sent from my Verizon, Samsung Galaxy smartphone

-------- Original message --------
From: donlewis2@comcast.net
Date: 7/28/19 11:06 AM (GMT-08:00)
To: Anthea Hansen <ahansen@delpuertowd.org>
Subject: Comment on EIR scoping for Del Puerto Canyon dam

Ms. Hansen,

I find nothing in your scoping documents that recognize that Del Puerto Canyon is a well-known location for birding recreation. Every spring, hundreds of birders visit the canyon, including the lower canyon, enjoying birding in a habitat and geographic location not otherwise accessible in the Bay Area.

I believe that the EIR should include a study of the impact on this known recreational usage of the lower canyon.

Thank you,

Donald Lewis
3810 Happy Valley Road
Lafayette, CA 94549

From:	Anthea Hansen
To:	Robin Cort; Sandra Watts
Subject:	Fwd: Please oppose a reservoir in lower Del Puerto Canyon
Date:	Sunday, July 28, 2019 12:57:31 PM

Sent from my Verizon, Samsung Galaxy smartphone

-------- Original message --------
From: steve rutledge <rutledgesteve@yahoo.com>
Date: 7/28/19 12:25 PM (GMT-08:00)
To: Anthea Hansen <ahansen@delpuertowd.org>
Subject: Please oppose a reservoir in lower Del Puerto Canyon

Hello. As an avid birder and lover of wildlife, I am strongly opposed to a reservoir in lower Del Puerto Canyon. I believe this project would have a seriously detrimental environmental effect on this special area. Please oppose this project. Thank you.

Julie Beer
334 College Ave. Apt. E
Palo Alto, CA 94306
650-328-5097
rutledgeteve@yahoo.com

From:	Anthea Hansen
To:	Robin Cort; Sandra Watts
Subject:	Fwd: del puerto dam
Date:	Wednesday, July 31, 2019 12:25:39 PM

Sent from my Verizon, Samsung Galaxy smartphone

-------- Original message --------
From: Ray Tackaberry <raytackaberry@yahoo.com>
Date: 7/28/19 3:55 PM (GMT-08:00)
To: Anthea Hansen <ahansen@delpuertowd.org>
Subject: del puerto dam

To whom it may concern,

I've been coming up Del Puerto Canyon since I was 2 years old and I currently live up here. I am SHOCKED and very CONCERED about how LITTLE has been said about this project up until July 24th.

Why wasn't the Notice of Preparation and Initial Study released sooner? 5 Days to review that paperwork before comments are closed seems very rushed. I also didn't appreciate the meeting being held so EARLY, many people this project would effect commute to and from the Bay Area and had absolutely no way to show up to a meeting at 4pm, I feel it was done on purpose.

I plan to fight this Reservoir project until the very end. How is this benefiting our community AT ALL? All it is doing is increasing risk.

We do not need all that Native-American history disturbed, We do not need our canyon destroyed and the natural beauty disturbed. The first dinosaur found in California was found RIGHT where you want to put that dam. Who knows what else you will be burying never to be discovered by future generations.

What happens if the Dam breaks? Patterson will flood. A DAM on a FAULT LINE? What are you guys thinking?

The public needs more information and you need to open comments back up for AT LEAST another month.

We need more reservoirs in this state, that much I can agree with but this site has way too much history. Please reconsider.

Loyal to Del Puerto Canyon,

Raymond Tackaberry
408-897-0062

From:	Anthea Hansen
To:	Robin Cort; Sandra Watts
Subject:	Fwd: Comments on Del Puerto Canyon Reservoir
Date:	Wednesday, July 31, 2019 12:26:46 PM

Sent from my Verizon, Samsung Galaxy smartphone

-------- Original message --------
From: John Harris <johnh@mills.edu>
Date: 7/28/19 5:32 PM (GMT-08:00)
To: Anthea Hansen <ahansen@delpuertowd.org>
Subject: Comments on Del Puerto Canyon Reservoir

Dear Ms. Hansen,

Thank you for the opportunity to comment on the proposed Del Puerto Canyon Reservoir.

First of all, I believe the comment period should be extended. It was not well advertised. I only learned of it because of a shared Facebook post, and I was not able to find information on the web sites of the cooperating agencies at that time. I subscribe to the Modesto Bee and saw no announcement of the informational meeting or the comment deadline.

Secondly, I believe that there are significant recreational impacts. Del Puerto Canyon is used by people throughout central California as a site for nature observation and photography. This means that the loss of grassland habitat, and the impacts of the relocated road, depending on the alternative chosen, could impact this activity.

It is important that the relocated road have opportunities for people to pull over to observe and photograph wildlife, flowers, etc.

The loss of grassland habitat is significant, as you have acknowledged, and impacts a number of wildlife species of varying conservation status, for example, the Grasshopper Sparrow, and CDFW Species of Special Concern. Other Species of Special Concern in that area include Northern Harrier and Loggerhead Shrike, and I'm sure there are others. I believe that mitigation for habitat loss, perhaps by guaranteeing the preservation of similar habitat, would be appropriate. Grassland habitats in this area have been severely impacted by development.

Please inform me when the EIR is complete, and of the comment period for the EIR. You may use this address: johnh@mills.edu.

Thank you very much,

John H. Harris

Oakdale, CA

From:	Anthea Hansen
To:	Robin Cort; Sandra Watts
Subject:	Fwd: Comments Regarding NOP of the Del Puerto Canyon Reservoir Project
Date:	Wednesday, July 31, 2019 12:27:51 PM

Sent from my Verizon, Samsung Galaxy smartphone

-------- Original message --------
From: Nancy Wenninger <nwenninger@aol.com>
Date: 7/28/19 10:53 PM (GMT-08:00)
To: Anthea Hansen <ahansen@delpuertowd.org>
Subject: Comments Regarding NOP of the Del Puerto Canyon Reservoir Project

Dear Ms. Hansen:

Thank you for the opportunity to comment on this proposed project. On behalf of 400+ members of the Mt. Diablo Audubon Society, I am writing to urge you to carefully consider potential impacts of this project on wildlife. Del Puerto Canyon is a popular area for wildlife viewing. Each year our chapter sponsors field trips in late spring to view bird species not readily found in other areas. Our members use Del Puerto Canyon road for this purpose.

When studying impacts to biological resources, please include impacts of artificial lighting on wildlife, particularly birds. Based on the daily cycle of light and dark, birds have evolved to know when it is time to mate, breed, forage or migrate. If natural day/night rhythms are altered by artificial light, natural behavior patterns change. Scientists around the world have been gathering mounting evidence that artificial light is altering birds' physiology. Estrogen and testosterone are suppressed, and the birds are changing their singing, mating and feeding behavior. They have also been observed to have difficulty sleeping with bright lights. Artificial lighting also confuses birds and disrupts nighttime migration; every year millions of them die colliding with illuminated structures.

I assume that the regulatory agencies will require mitigation of lost habitat if the project is approved. We urge you to acquire and preserve habitat as close as possible to the impacts of the project.

Finally, please include me in any future notices as the project proceeds so that MDAS can stay abreast.

Thank you for your consideration in this matter.

Sincerely,

Nancy H. Wenninger

Conservation Chair

1091 Walker Avenue

Walnut Creek, CA 94596

From:	Anthea Hansen
To:	Robin Cort; Sandra Watts
Subject:	Fwd: del puerto canyon reservoir
Date:	Wednesday, July 31, 2019 12:29:51 PM

Sent from my Verizon, Samsung Galaxy smartphone

-------- Original message --------
From: wayne <wsa@ieee.org>
Date: 7/29/19 3:46 AM (GMT-08:00)
To: Anthea Hansen <ahansen@delpuertowd.org>
Subject: del puerto canyon reservoir

A few questions about the project.

1) In the proposed EIR report the scope of the report and project seems to only concern itself with areas from the dam and downstream and completely ignoring upstream impacts (i.e., to residents of DPCR) why, because we are primarily negative stakeholders?

2) Is a mosquito abatement and tick abatement (if such a thing exists) report going to be generated as with the standing water as well as the increased humidity there is bound to be many more of both. DPC is a very delicately balanced environmental area and the standing water and humidity would greatly affect it for many miles from the dam (humidity here is often single digits in the summer and less than 1% change makes a difference)

3) While the fire hazard of the immediate area would be near zero (water is hard to burn being that it is already an oxide) the increase in people will definitely increase the fires in the canyon, we have had at least 5 "arson" or accidental fires this year. Sure you say that this project only concerns itself with the water storage aspect but you surely cannot be ignorant to the fact that the county is already selling it to residents (who do not live near it) as a major new recreational area. Most locals do not want the off road park and detest the county spending tax dollars to expand and advertise it on billboards.

4) The proposed road reroutes seem to mostly ignore the needs of DPCR residents as they all are longer than the current one and have more potential blocking obstacles (small bridges and tunnels or cuts) in the event of a major emergency such as design basis earthquake.

5) I know that land has not been purchased per regulation(s) but is the land currently under contract or in negotiations for purchase and if not why not and if so for how much?

6) What is the total size of the proposed land purchase?

7) How is the entire construction and operation (water storage AND recreational) going to be funded?

8) What is the seismic design basis specification?

9) Where is the flood zone going to be located for events that exceed the design basis as there is no existing waterway that can absorb the water since the canals are closed automatically during such an event.

10) What is going to be done to ensure that the entire area does not become a homeless encampment since it will now be public property and close to "freebie" services?

11) Why was the del puerto site chosen over the ingram site and why was much of this activity kept from local residents, the ingram canyon site was graded better in several aspects than Del Puerto in the 2011 report, actually is was better in most ways, efficiency of storage, size, risks...

12) What are the estimated operational expenses in terms of $ and personnel and what assurances will there be to ensure that ordinary taxpayers do not get left holding the bag as with high speed rail, and so many other government projects. We need to be thinking small instead of simply turning into a mid priced bay area overflow.

and please add me to you stake holder mailing list...

thank you,

Wayne Armbrust
p.o. box 1088
Patterson, ca 96363-1088
wsa@ieee.org

From: Anthea Hansen
To: Robin Cort; Sandra Watts
Subject: Fwd: Del Puerto Canyon Reservoir Project
Date: Wednesday, July 31, 2019 12:32:05 PM

Sent from my Verizon, Samsung Galaxy smartphone

-------- Original message --------
From: "Debbi B." <dgbshop@gmail.com>
Date: 7/29/19 4:58 PM (GMT-08:00)
To: Anthea Hansen <ahansen@delpuertowd.org>
Subject: Del Puerto Canyon Reservoir Project

Dear Ms. Hansen:

I just became aware of this project, so I only have time to register some brief comments.

As you may know, this area is important to birders/ornithologists, botanists, entomologists (including college course field trips that I myself have been on), herpetologists, geologists, conservationists and others. It is important habitat.

In reviewing the map showing the road realignments, it appears this would cover/eliminate "Graffiti Rock" and the areas surrounding it, as well as other areas that are frequently visited by the above parties.

Please consider these uses as you go through the process.

Deborah Brusco

From:	Anthea Hansen
To:	Robin Cort; Sandra Watts
Subject:	Fwd: Comments on proposed Del Puerto Canyon reservoir
Date:	Wednesday, July 31, 2019 12:35:54 PM

Note: This thoughtful comment was received after 5pm. AH

Sent from my Verizon, Samsung Galaxy smartphone

-------- Original message --------
From: Harold Reeve <hreeve@sbcglobal.net>
Date: 7/29/19 5:23 PM (GMT-08:00)
To: Anthea Hansen <ahansen@delpuertowd.org>
Subject: Comments on proposed Del Puerto Canyon reservoir

July 29, 2019

Dear Ms. Hansen,

I am writing concerning the proposed reservoir in Lower Del Puerto Canyon. I have lived in Modesto and Ceres for the past 37 years and am preparing to begin my 38th year of teaching high school science in the city of Ceres. My wife is a high school science teacher in Modesto and we are frequent visitors to Del Puerto Canyon, including the lower canyon area where the reservoir will be located. Our main reasons to visit the canyon are educational and recreational, and it is my hope that such uses are included in any studies and Environmental Impact Report completed prior to beginning the project.

Every school year I take several field trips with groups of my students into Del Puerto Canyon. These trips focus on native plants, birds, geology, and photography along the roadside in the lower canyon because all property beyond the road is private. Time constraints often preclude our going higher up, but when possible we will continue up the canyon to Frank Raines Park and beyond as well. No other location within reasonable driving distance from my school allows my students to study and appreciate the natural beauty of the Diablo Range and its native plants and wildlife. They clearly recognize the stark contrast between the mostly natural canyon and the highly altered state of the Central Valley. Even the other public entry into the inner coast range in our county, Diablo Grande Parkway, pales in comparison because it lacks much of the rugged landforms, a (usually) perennial stream with its associated riparian vegetation, and public amenities higher up in the mountains.

Many of my students complete research on native plants, birds, and other wildlife found in Del Puerto Canyon. I have attached an example of a research poster recently completed by a sophomore student in my Biology class. For the sake of interest and example, I hope you will take a moment to look at her poster.

In addition to field trips with my students, I often visit Del Puerto Canyon for the purpose of birdwatching, or birding. In much of the canyon, including the lower canyon, this is a strictly roadside activity because the property is private. Nevertheless, Del Puerto Canyon is a prime birding destination for residents of the Central Valley as well as many from the Bay Area. Many birders record their field trip bird lists on Cornell University's eBird.org website, and I count 1868 checklists submitted and 177 species of birds recorded from Del Puerto Canyon on eBird. Of these, 137 species and 1038 checklists are, in whole or in part, from the portion of Del Puerto Canyon Rd. that would be inundated by the reservoir. Nearly all of this birding activity is from the most recent five year period, and only a fraction of birders record their observations on eBird. In addition, lower Del Puerto Canyon has some specialty birds that most observers have seen nowhere else in Stanislaus County, including Grasshopper Sparrow and Costa's Hummingbird. California Department of Fish and Wildlife lists two species that nest in the lower canyon, Burrowing Owl and Grasshopper Sparrow, as Species of Special Concern. All of this is to say that the lower Del Puerto Canyon Rd. is of significant value to the birding community, and a new road built from Diablo Grand Parkway will bypass, rather than adequately replace, this prime birding location.

I fear that the construction of a reservoir within lower Del Puerto Canyon endangers much of the educational and recreational value provided by public access that is not available elsewhere. I find it unfortunate that the proposed reservoir will inundate parts of the only public access through the Diablo Range in Stanislaus County. It seems certain that other locations have been proposed and considered: however, I urge you to again to look closely at other locations that will not preclude public access to and will cause the inundation of the unique set of natural resources available in Del Puerto Canyon. I suppose that the once-proposed Diablo Grande reservoir may not be viable, but what about other nearby creeks without any public access, including Ingram Creek and Kern Canyon to the north or Crow and Orestimba creeks to the south? None of these would have the added expense of public highway relocation and all would have fewer impacts on the educational and recreational values I have discussed.

The Environmental Checklist of Attachment B of the Initial Study does not directly address educational values, nor does section 1.15 Recreation on this Checklist directly address those recreation uses I have mentioned, yet it is my hope and request that such uses will be addressed in the planning, EIR, and implementation stages of this project.

Sincerely,

Harold Reeve

1309 River Valley Circle
Modesto, CA 95351

From:	Anthea Hansen
To:	Robin Cort
Subject:	Fwd: Del Puerto Canyon Reservoir Project
Date:	Wednesday, July 31, 2019 12:43:02 PM

Sent from my Verizon, Samsung Galaxy smartphone

-------- Original message --------
From: Graham Chisholm <graham@csgcalifornia.com>
Date: 7/30/19 6:37 PM (GMT-08:00)
To: Anthea Hansen <ahansen@delpuertowd.org>
Subject: Del Puerto Canyon Reservoir Project

Dear Ms. Hansen,

Please put me on the interested parties list to receive all notices and documents related to the Del Puerto Canyon Reservoir Project. I will want an opportunity to participate during the development of the draft and final Environmental Impact Report.

Regards,

Graham Chisholm

GRAHAM CHISHOLM
Senior Policy Advisor
1100 11th Street, 5th Floor | Sacramento, CA 95814 | Office: (916) 558-1516
Policy Solutions for a Greener California: www.csgcalifornia.com

Sign up here to receive updates from the CSG Policy Blog!

From: Anthea Hansen
To: Robin Cort; Sandra Watts
Subject: Fwd: Comments for proposed Del Puerto Reservoir EIR
Date: Wednesday, July 31, 2019 12:42:28 PM

Note: comment rec'd 1159 PM 7/29.

Sent from my Verizon, Samsung Galaxy smartphone

-------- Original message --------
From: Commisioner Elias Funez <ptownelias@yahoo.com>
Date: 7/29/19 11:59 PM (GMT-08:00)
To: Anthea Hansen <ahansen@delpuertowd.org>
Subject: Comments for proposed Del Puerto Reservoir EIR

Hello, and thank you for taking my observations into consideration regarding the proposed Del Puerto Reservoir and 200 foot high dam of the Del Puerto Gateway.

Being a former City of Patterson Planning Commissioner, General Plan Advisory Committee member, and Parks and Recreation Commissioner, as well as being a born and raised Pattersonite, I speak with the utmost respect and well intention for all that reside in this community.

Since I was very young, I have been taken to the place named by the Spanish in the late 1700s that they called Del Puerto Canyon, or the "door way" canyon due to the unique feature carved by thousands of years of Del Puerto Creek eroding through the upturned layers of the Valley floor as it makes its way to the San Joaquin River.

At the base of this very rock feature, the one that you, the Del Puerto Water District, wish to use to ease in the construction of the Del Puerto Dam, is an ancient pathway used by the Native Americans and other historical figures in the past. It lies at the base of the northern abutment of the proposed dam and risks being destroyed forever if this dam is built.

The name Del Puerto has been synonymous with Patterson since the city's beginning with important names such as Del Puerto Avenue, Del Puerto Hospital, Del Puerto Health Care District, and Del Puerto High School and of course Del Puerto Water District, being named in honor of the historic pathway feature.

Destroying this for any purpose would be akin to demolishing Yosemite's Half Dome to utilize it's granite. Years later people will ask us what Del Puerto is in reference of and we'll have to say we'd love to show you, but the Del Puerto Water District took away our last remaining source of Native American cultural identity when they built this dam.

Aside from the entrance and countless other mortar grinding rocks, there is an abundance of native sites that stand to be jeopardized if the current plans are constructed including and especially the Indian Burial Canyon up about 3 miles.

During the scoping meeting I heard a consultant state that the land up in question is all private property and seemed to shrug off any usage of that area as people that shouldn't be there anyways. Well people can be there, within the public right of way, enjoying the historic Del Puerto Canyon Road from their bikes, cars, or on foot, enjoying wildlife, photography, or just taking in the sights and sounds of nature.

Its no surprise that every year folks enjoy the Canyon during the spring time when the water runs clear and the leaves of the forest are green.

Yes there is an important forest that is currently there amd would be damaged and destroyed with the inundation of water up the creek. These are old growth oak and cottonwood trees.

The EIR should take place during a span of the seasonal nature of Del Puerto Creek in order to get the most accurate data for the EIR, ie, Spring to Fall. It would be negligent to only gather data during one season.

During the scoping meeting a comment was made by organizers regarding the pumps of the San Luis Reservoir or state water project system that might not work accordingly to store or pump the DPWD water when needed. If that is the case, then studies need to go in to the cost analysis that shows how much it would cost to impove those pumps rather that build a new dam and relocate the road.

Other alternatives to the project need to show a lower version of the dam and reservoir. One that wouldnt impede up on the historic Del Puerto Canyon Road. Also alternatives that utilize other canyons nearby, ie Hansen Canyon, Kern Creek Canyon.

For other local history on the Canyon ease reference the Wild Wild Westside CD tour available from the City of Patterson.

Thanks you for my comment consideration,
Elias Funez

Ron West
720 North Third Street
Patterson, Ca. 95363
(209) 985-8895 Ronwest.associates@gmail.com

July 29, 2019

TO: Anthea Hansen
General Manager
Del Puerto Water District
17840 Ward Avenue
Patterson, CA 95363

RE: COMMENTS ON PROPOSED NEW WATER STORAGE FACILITY

Anthea, Board and Consultants;

Thank you for a chance to comment on a proposed water storage facility at Patterson's front door, and Anthea, thank you for the discussions about my questions concerning uses. As we discussed, I am a 100% advocate a "lake" or "bay" at our City's entrance. And a 200% fan of capturing the water from the hills and using it for recreation, and/or recharge. We cannot let the water we have always sent to the river, get past Patterson. It needs to be stopped, used and or recharged. Period. So, my first question and concern are: are you proposing to block and control the existing flow, and how can/does the public benefit from that? Please address this in your discussions.

My second concern is that you are not proposing to allow public recreational uses, which I see creating a number of problems which can never really be resolved. Water is a magnet for people, especially outdoor types. The fencing and security and enforcement, and hassle and bad press to keep anyone from touching your water will be a nightmare forever. I would like limited public uses discussed, including a regional dog park, and possibly limited non-motorized water craft. Model boats and planes, and other specific uses can allow some low-intensity users. Please consider this in your discussions. Thank you for your time and consideration.

Ron West

P.S. Please excuse the after-hours e-mail. I am having computer problems and hope you receive this.

DEPARTMENT OF ENVIRONMENTAL RESOURCES

Stanislaus County
Striving to be the Best

3800 Cornucopia Way, Suite C, Modesto, CA 95358-9492
Phone: (209) 525-6700 Fax: (209) 525-6774

August 6, 2019

TO: ANTHEA HANSEN, DEL PUERTO WATER DISTRICT

FROM: EMILY GRIMES, DEPARTMENT OF ENVIRONMENTAL RESOURCES

SUBJECT: **ENVIRONMENTAL REFERRAL – DEL PUERTO WATER DISTRICT – NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE DEL PUERTO CANYON RESERVOIR PROJECT**

The Department has reviewed the information available on the subject project and it is our position that the project **will not have a significant effect on the environment**. Listed below are the specific impacts which support our determination and the mitigation or condition that needs to be implemented:

BUSINESSES W/ HAZMAT

The applicant should contact the Department of Environmental Resources (DER) regarding appropriate permitting requirements for hazardous materials and/or wastes. Applicant and/or occupants handling hazardous materials or generating hazardous wastes must notify the Department of Environmental Resources relative to the following: (Calif. H&S, Division 20)

A. Permits for the underground storage of hazardous substances at new or the modification of an existing tank facilities.
B. Requirements for registering as a handler of hazardous materials in the County.
C. Submittal of hazardous materials Business information into the California Electronic Reporting System (CERS) by handlers of materials in excess of 55 gallons, 500 pounds of a hazardous material, or of 200 cubic feet of compressed gas.
D. The handling of acutely hazardous materials may require the preparation of a Risk Management Prevention Program which must be implemented prior to operation of the facility. The list of acutely hazardous materials can be found in SARA, Title III, Section §302.
E. Generators of hazardous waste must notify the Department relative to the: (1) quantities of waste generated; (2) plans for reducing wastes generated; and (3) proposed waste disposal practices. Generators of hazardous waste must also use the CERS data base to submit chemical and facility information to the DER.
F. Permits for the treatment of hazardous waste on-site will be required from the hazardous materials division.
G. Medical waste generators must complete and submit a questionnaire to the department for determination if they are regulated under the Medical Waste Management Act.

MONITORING WELLS AND EXPLORATORY BORINGS

If the project involves the installation of monitoring wells and/or borings, the applicant must submit a current permit application for groundwater monitoring wells and exploratory borings to the Hazardous Materials Division within DER. Please contact the DER to obtain guidance on this process. If the work will be conducted within the City of Modesto, then they are the lead agency for wells and/or borings and must be contacted for their requirements.

Del Puerto Reservoir: Public Comment [due 7/29]

Shivaugn Alves started this petition to Del Puerto Water District Anthea Hansen and 2 others

Community

The proposed Del Puerto Reservoir is another massive project happening in our community. If signed, this petition will serve as your public comment that you expect our leaders to seriously consider:

- recreational opportunities (hiking, biking, fishing, disc golf, SUP, etc) within a naturesque setting
- preservation of Native American and paleontological artifacts for education
- solar-powered water pumps to

108 have signed. Let's get to 200!

Robin Cort United States

Display my name and comment on this petition reduce air pollution

Additional Information

The current language in the reservoir plan indicates that our community would bare the burden of a flood disaster, while receiving no benefits in our quality of life. The West Side is home to the county's garbage incinerator, county's most obese youth, numerous mega warehouses, truck stops, poor air quality, and Interstate 5.

Yet, as the population and development increases, there exist few if any natural spaces for residents to enjoy. Hiking, biking, fishing, frisbee, paddling, in a native oak and cottonwood nature reserve could assist in addressing our community's health and well being. Access to such a space would provide multiple positive externalities for residents and visitors alike.

The Diablo Canyon was once home to Native Americans of various tribes. Grinding rocks, ovens, and remains are present still today. Paleontological discoveries have also been made in the area. Preserving these artifacts for the public and students would provide a massive historical, cultural, and educational benefit.

Ranking within the very worst in the nation in air quality, it is highly recommended that the plan include renewable energy (solar, wind) alternatives for reservoir water pumping needs.

This petition aims to provide a voice for those on the West Side who would like to see this plan benefit the many, rather than the few. Careful, considerate, and strategic planning could meet all of our needs. We call on the Del Puerto Water District and the Stanislaus County Board of Supervisors to expand the vision for this important project.

This form is to be accepted as a citizen's official comment.

*Due to only five days to report comments this form has been created

Start a petition of your own

This petition starter stood up and took action. Will you do the same?

Start a petition

Updates

100 supporters 2 days ago

Shivaugn Alves started this petition 4 days ago

Reasons for signing

Sean Hansen · 4 days ago

I am signing because, as a resident & home owner of Patterson Ca, I would like this project to include recreational areas for our community. I would like to be able to swim, boat, jet ski, camp, hike, picnic along this proposed site.

2 · Report

nikki barstow · 1 day ago

Maybe I am wrong but sounds like another greedy land grab to steal water! When is enough? We enjoy this land for hiking, meditation and it's natural beauty. I say forget it and collect your water from Neste!

0 · Report

View all reasons for signing

Report a policy violation

Petitions promoted by other Change.org users

Promoted by 106 supporters

Promoted by 1 supporter

Promoted by 2,683 supporters

APPENDIX B1: SPECIES LISTS

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To: April 15, 2019
Consultation Code: 08ESMF00-2019-SLI-1675
Event Code: 08ESMF00-2019-E-05336
Project Name: Del Puerto Canyon Reservoir

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

Project Summary

Consultation Code: 08ESMF00-2019-SLI-1675

Event Code: 08ESMF00-2019-E-05336

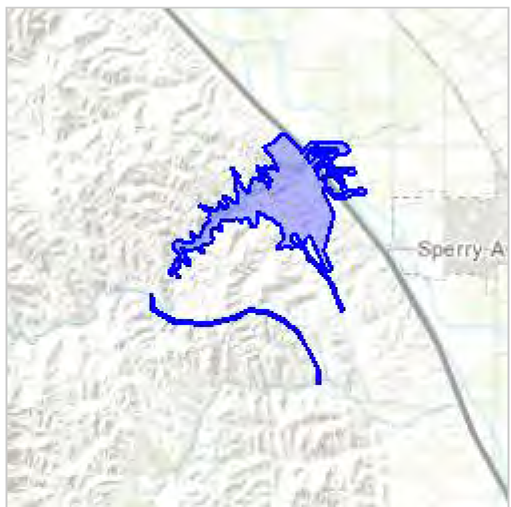
Project Name: Del Puerto Canyon Reservoir

Project Type: DAM

Project Description: New off stream reservoir project in western Stanislaus county (approximately 500 acres), timed for 2021 to 2025.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/37.47223041327274N121.20884118063165W



Counties: Stanislaus, CA

Endangered Species Act Species

There is a total of 9 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
San Joaquin Kit Fox *Vulpes macrotis mutica* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2873	Endangered

Reptiles

NAME	STATUS
Blunt-nosed Leopard Lizard *Gambelia silus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/625	Endangered
Giant Garter Snake *Thamnophis gigas* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4482	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened
California Tiger Salamander *Ambystoma californiense* Population: U.S.A. (Central CA DPS) There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2076	Threatened

Fishes

NAME	STATUS
Delta Smelt *Hypomesus transpacificus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/321	Threatened

Insects

NAME	STATUS
Valley Elderberry Longhorn Beetle *Desmocerus californicus dimorphus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7850 Habitat assessment guidelines: https://ecos.fws.gov/ipac/guideline/assessment/population/436/office/11420.pdf	Threatened

Crustaceans

NAME	STATUS
Vernal Pool Fairy Shrimp *Branchinecta lynchi* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/498	Threatened
Vernal Pool Tadpole Shrimp *Lepidurus packardi* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2246	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Plant List

34 matches found. *Click on scientific name for details*

Search Criteria
Found in Quads **3712154, 3712153, 3712152, 3712144, 3712143, 3712142, 3712134 3712133** and **3712132**;

Modify Search Criteria Export to Excel Modify Columns Modify Sort Display Photos

Scientific Name	Common Name	Family	Lifeform	Blooming Period	CA Rare Plant Rank	State Rank	Global Rank
Acanthomintha lanceolata	Santa Clara thorn-mint	Lamiaceae	annual herb	Mar-Jun	4.2	S4	G4
Acmispon rubriflorus	red-flowered bird's-foot trefoil	Fabaceae	annual herb	Apr-Jun	1B.1	S2	G2
Allium sharsmithiae	Sharsmith's onion	Alliaceae	perennial bulbiferous herb	Mar-May	1B.3	S2	G2
Amsinckia grandiflora	large-flowered fiddleneck	Boraginaceae	annual herb	(Mar)Apr-May	1B.1	S1	G1
Androsace elongata ssp. acuta	California androsace	Primulaceae	annual herb	Mar-Jun	4.2	S3S4	G5? T3T4
Aspidotis carlotta-halliae	Carlotta Hall's lace fern	Pteridaceae	perennial rhizomatous herb	Jan-Dec	4.2	S3	G3
Blepharizonia plumosa	big tarplant	Asteraceae	annual herb	Jul-Oct	1B.1	S1S2	G1G2
Calyptridium parryi var. hesseae	Santa Cruz Mountains pussypaws	Montiaceae	annual herb	May-Aug	1B.1	S2	G3G4T2
Campanula exigua	chaparral harebell	Campanulaceae	annual herb	May-Jun	1B.2	S2	G2
Campanula sharsmithiae	Sharsmith's harebell	Campanulaceae	annual herb	Apr-Jun	1B.2	S1S2	G1G2
Caulanthus lemmonii	Lemmon's jewelflower	Brassicaceae	annual herb	Feb-May	1B.2	S3	G3

Cirsium fontinale var. campylon	Mt. Hamilton fountain thistle	Asteraceae	perennial herb	(Feb)Apr-Oct	1B.2	S2	G2T2
Clarkia breweri	Brewer's clarkia	Onagraceae	annual herb	Apr-Jun	4.2	S4	G4
Collomia diversifolia	serpentine collomia	Polemoniaceae	annual herb	May-Jun	4.3	S4	G4
Convolvulus simulans	small-flowered morning-glory	Convolvulaceae	annual herb	Mar-Jul	4.2	S4	G4
Cryptantha rattanii	Rattan's cryptantha	Boraginaceae	annual herb	Apr-Jul	4.3	S4	G4
Delphinium californicum ssp. interius	Hospital Canyon larkspur	Ranunculaceae	perennial herb	Apr-Jun	1B.2	S3	G3T3
Eriastrum tracyi	Tracy's eriastrum	Polemoniaceae	annual herb	May-Jul	3.2	S3	G3Q
Eryngium racemosum	Delta button-celery	Apiaceae	annual / perennial herb	Jun-Oct	1B.1	S1	G1
Eryngium spinosepalum	spiny-sepaled button-celery	Apiaceae	annual / perennial herb	Apr-Jun	1B.2	S2	G2
Eschscholzia rhombipetala	diamond-petaled California poppy	Papaveraceae	annual herb	Mar-Apr	1B.1	S1	G1
Fritillaria falcata	talus fritillary	Liliaceae	perennial bulbiferous herb	Mar-May	1B.2	S2	G2
Galium andrewsii ssp. gatense	phlox-leaf serpentine bedstraw	Rubiaceae	perennial herb	Apr-Jul	4.2	S3	G5T3
Leptosiphon ambiguus	serpentine leptosiphon	Polemoniaceae	annual herb	Mar-Jun	4.2	S4	G4
Leptosyne hamiltonii	Mt. Hamilton coreopsis	Asteraceae	annual herb	Mar-May	1B.2	S2	G2
Lomatium observatorium	Mt. Hamilton lomatium	Apiaceae	perennial herb	Mar-May	1B.2	S1	G1
Madia radiata	showy golden madia	Asteraceae	annual herb	Mar-May	1B.1	S3	G3
Malacothamnus hallii	Hall's bush-mallow	Malvaceae	perennial evergreen shrub	(Apr)May-Sep(Oct)	1B.2	S2	G2
Navarretia nigelliformis ssp. radians	shining navarretia	Polemoniaceae	annual herb	(Mar)Apr-Jul	1B.2	S2	G4T2
Pentachaeta exilis	San Benito						

ssp. aeolica	pentachaeta	Asteraceae	annual herb	Mar-May	1B.2	S2	G5T2
Phacelia phacelioides	Mt. Diablo phacelia	Hydrophyllaceae	annual herb	Apr-May	1B.2	S2	G2
Plagiobothrys uncinatus	hooked popcornflower	Boraginaceae	annual herb	Apr-May	1B.2	S2	G2
Plagiobothrys verrucosus	warty popcornflower	Boraginaceae	annual herb	Apr-May	2B.1	S1	G4G5
Streptanthus callistus	Mt. Hamilton jewelflower	Brassicaceae	annual herb	Apr-May	1B.3	S1S2	G1G2

Suggested Citation

California Native Plant Society, Rare Plant Program. 2019. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website http://www.rareplants.cnps.org [accessed 22 March 2019].

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Mt. Boardman (3712144) OR Mt. Stakes (3712134) OR Lone Tree Creek (3712154) OR Solyo (3712153) OR Copper Mtn. (3712143) OR Wilcox Ridge (3712133) OR Westley (3712152) OR Patterson (3712142) OR Orestimba Peak (3712132))
 AND Taxonomic Group IS (Ferns OR Gymnosperms OR Monocots OR Dicots OR Lichens OR Bryophytes)

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Acmispon rubriflorus red-flowered bird's-foot trefoil	PDFAB2A150	None	None	G2	S2	1B.1
Allium sharsmithiae Sharsmith's onion	PMLIL02310	None	None	G2	S2	1B.3
Amsinckia grandiflora large-flowered fiddleneck	PDBOR01050	Endangered	Endangered	G1	S1	1B.1
Blepharizonia plumosa big tarplant	PDAST1C011	None	None	G1G2	S1S2	1B.1
Campanula exigua chaparral harebell	PDCAM020A0	None	None	G2	S2	1B.2
Campanula sharsmithiae Sharsmith's harebell	PDCAM02100	None	None	G1G2	S1S2	1B.2
Caulanthus lemmonii Lemmon's jewelflower	PDBRA0M0E0	None	None	G3	S3	1B.2
Cirsium fontinale var. campylon Mt. Hamilton fountain thistle	PDAST2E163	None	None	G2T2	S2	1B.2
Delphinium californicum ssp. interius Hospital Canyon larkspur	PDRAN0B0A2	None	None	G3T3	S3	1B.2
Eriastrum tracyi Tracy's eriastrum	PDPLM030C0	None	Rare	G3Q	S3	3.2
Eryngium racemosum Delta button-celery	PDAPI0Z0S0	None	Endangered	G1	S1	1B.1
Eryngium spinosepalum spiny-sepaled button-celery	PDAPI0Z0Y0	None	None	G2	S2	1B.2
Eschscholzia rhombipetala diamond-petaled California poppy	PDPAP0A0D0	None	None	G1	S1	1B.1
Fritillaria falcata talus fritillary	PMLIL0V070	None	None	G2	S2	1B.2
Leptosyne hamiltonii Mt. Hamilton coreopsis	PDAST2L0C0	None	None	G2	S2	1B.2
Lomatium observatorium Mt. Hamilton lomatium	PDAPI1B2J0	None	None	G1	S1	1B.2
Madia radiata showy golden madia	PDAST650E0	None	None	G3	S3	1B.1
Malacothamnus hallii Hall's bush-mallow	PDMAL0Q0F0	None	None	G2	S2	1B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Navarretia nigelliformis ssp. radians shining navarretia	PDPLM0C0J2	None	None	G4T2	S2	1B.2
Pentachaeta exilis ssp. aeolica San Benito pentachaeta	PDAST6X041	None	None	G5T2	S2	1B.2
Phacelia phacelioides Mt. Diablo phacelia	PDHYD0C3Q0	None	None	G2	S2	1B.2
Plagiobothrys verrucosus warty popcornflower	PDBOR0V1D0	None	None	G4G5	S1	2B.1
Puccinellia simplex California alkali grass	PMPOA53110	None	None	G3	S2	1B.2

Record Count: 23

CNDDB GIS Based Query for Animal Species

5-mile search from study area boundary conducted on April 4, 2019.

Species Name	Common Name	Federal Status	State Status
Agelaius tricolor	tricolored blackbird	None	Candidate Endangered
Anniella pulchra	northern California legless lizard	None	SSC
Athene cunicularia	burrowing owl	None	SSC
Bombus crotchii	Crotch bumble bee	None	Candidate Endangered
Branta hutchinsii leucopareia	cackling (=Aleutian Canada) goose	Delisted	None
Buteo swainsoni	Swainson's hawk	None	Threatened
Ceratochrysis menkei	Menke's cuckoo wasp	None	None
Eremophila alpestris actia	California horned lark	None	None
Falco mexicanus	prairie falcon	None	None
Lanius ludovicianus	loggerhead shrike	None	SSC
Lasiurus cinereus	hoary bat	None	None
Lytta moesta	moestan blister beetle	None	None
Masticophis flagellum ruddocki	San Joaquin coachwhip	None	SSC
Oncorhynchus mykiss irideus pop. 11	steelhead - Central Valley DPS	Threatened	None
Pyrgulopsis diablensis	Diablo Range pyrg	None	None
Rana boylii	foothill yellow-legged frog	None	Candidate Threatened
Spea hammondii	western spadefoot	None	SSC
Taxidea taxus	American badger	None	SSC
Vireo bellii pusillus	least Bell's vireo	Endangered	Endangered
Vulpes macrotis mutica	San Joaquin kit fox	Endangered	Threatened

SSC = Species of Special Concern

APPENDIX B2: Species Observed in the Study Area

Scientific Name	**Common Name**
Plant Species	
Achillea millefolium	common yarrow
Achyrachaena mollis	blow-wives
Acmispon americanus	America bird's-foot trefoil
Acmispon glaber	deer broom
Acmispon maritimus var. *maritimus*	Coastal lotus
Acmispon strigosus	strigose lotus
Acmispon wrangelianus	Chilean trefoil
Aesculus californica	California buckeye
Agoseris heterophylla var. *heterophylla*	annual agoseris
Allium serra	jeweled onion
Amaranthus albus	tumbleweed
Amaranthus blitoides	procumbent pigweed
Amaranthus palmeri	Palmer's amaranth
Amsinckia eastwoodiae	Eastwood's fiddleneck
Amsinckia intermedia	common fiddleneck
Amsinckia lycopsoides	bugloss-flowered fiddleneck
Amsinckia menziesii	Menzies' fiddleneck
~~*Amsinckia tessellata var. gloriosa*~~	~~Carrizo fiddleneck~~
Anthemis cotula	Mayweed
Androsace elongata subsp. *acuta*	California rockjasmine
Artemisia californica	California sage brush
Artemisia douglasiana	mugwort
Asclepias californica	California milkweed
Asclepias fascicularis	narrow-leaved milkweed
Astragalus ~~sp.~~*oxyphysus*	Mt. Diablo milkvetch
~~*Athysanus unilateralis*~~	~~ladies-tongue mustard~~
Atriplex fruticulosa	ball saltscale
Atriplex serenana	saltscale
Avena barbata	slender wild oat
Avena fatua	wild oats
Baccharis pilularis	coyote brush
Baccharis salicifolia	mule fat
Bassia hyssopifolia	five-horned smotherweed
Blepharizonia laxa	glandular big tarplant
Blepharizonia plumosa	big tarplant
~~*Bolboschoenus maritimus* subsp. *paludosus*~~	~~alkali bulrush~~
Bowlesia incana	hoary bowlesia
Bromus diandrus	ripgut brome
Bromus hordeaceus	soft chess

Bromus ~~*madritensis* subsp.~~ *rubens*	red brome
Bromus sterilis	poverty brome
Calandrinia menziesii	red maids
California macrophylla	round-leaved filaree
Calochortus venustus	butterfly mariposa lily
Camissoniopsis intermedia	intermediate sun cups
Capsella bursa pastoris	shepherd's-purse
Cardamine oligosperma	bitter cress
Carduus pycnocephalus	Italian thistle
Carduus tenuiflorus	slender-flowered thistle
Castilleja affinis subsp. *affinis*	coast paintbrush
Castilleja exserta	purple owl's-clover
Castilleja foliolosa	paintbrush
~~*Caulanthus flavescens*~~	~~yellow California mustard~~
Caulanthus lasiophyllus	California mustard
~~*Caulanthus lemmonii*~~	~~Lemmon's jewelflower~~
Centaurea calcitrapa	purple star-thistle
Centaurea melitensis	tocalote
Centaurea solstitialis	yellow star-thistle
Centromadia pungens	common spikeweed
Cerastium glomeratum	Sticky mouse-eared chickweed
Chenopodium album	lamb's-quarters
Chenopodium murale	nettle-leaf goosefoot
Chlorogalum pomeridianum	soap plant
Chorizanthe membranacea	pink spineflower
Cirsium vulgare	bull thistle
Clarkia affinis	chaparral clarkia
Clarkia tembloriensis subsp. *tembloriensis*	Temblor clarkia
Clarkia unguiculata	elegant clarkia
~~*Claytonia exigua* subsp. *exigua*~~	~~little springbeauty~~
Claytonia parviflora	narrow-leaved miner's lettuce
Claytonia perfoliata	miner's lettuce
Collinsia heterophylla	purple Chinese houses
Collinsia sparsiflora subsp. *collina*	hillside collinsia
Convolvulus arvensis	field bindweed
Cotula australis	Australian brass buttons
Crassula connata	pygmyweed
Croton setiger	dove weed
Crypsis alopecuroides	foxtail prickle grass
Crypsis schoenoides	swamp prickle grass
Cryptantha flaccida	beaked cryptantha

~~*Cryptantha nemaclada*~~	~~Colusa cryptantha~~
Cryptantha nevadensis var. *rigida*	rigid cryptantha
Cynodon dactylon	Bermuda grass
Datura wrightii	sacred thornapple
Daucus pusillus	rattlesnake weed
Deinandra kelloggii	Kellogg's tarweed
Delphinium patens subsp. *patens*	spreading larkspur
Delphinium spp.	larkspur species
Diplacus aurantiacus	bush monkeyflower
Dipterostemon capitatus	blue dicks
Distichlis spicata	saltgrass
Dittrichia graveolens	stinkweed
Eastwoodia elegans	yellow mock aster
Eleocharis parishii	Parish's spikerush
Elymus triticoides	creeping wildrye
Emmenanthe penduliflora var. *penduliflora*	whispering bells
Epilobium brachycarpum	panicled willowherb
Epilobium campestre	smooth spike-primrose
Epilobium canum	California fuschia
Epilobium cleistogamum	cleistogamous spike-primrose
Eremalche parryi	Parry's mallow
Ericameria linearifolia	Interior goldenbush
Erigeron bonariensis	South American horseweed
Erigeron canadensis	Canadian horseweed
Eriodictyon californicum	California yerba santa
Eriogonum angulosum	angle-stem wild buckwheat
Eriogonum fasciculatum var. *polifolium*	California wild buckwheat
Eriogonum gracile var. gracile	slender wild buckwheat
Eriogonum nudum var. *auriculatum*	naked wild buckwheat
Eriogonum nudum var. *pubiflorum*	Fremont's wild buckwheat
Erodium botrys	big heronbill
Erodium brachycarpum	foothill filaree
Erodium cicutarium	red-stemmed filaree
Erodium moschatum	white-stemmed filaree
Erythranthe guttata	seep-spring monkeyflower
Eschscholzia californica	California poppy
Eschscholzia hypecoides	San Benito poppy
~~*Eschscholzia rhombipetala*~~	~~diamond-petaled California poppy~~
Eucalyptus camaldulensis	red gum
Eucalyptus globulus	blue gum
Eulobus californicus	California primrose

Euphorbia maculata	spotted spurge
Euphorbia ocellata subsp. *ocellata*	valley spurge
Euphorbia serpyllifolia subsp. *serpyllifolia*	thyme-leaved spurge
Euphorbia spathulata	warty spurge
Euthamia occidentalis	western goldenrod
Festuca microstachys	small fescue
Festuca myuros	foxtail fescue
Festuca perennis	Italian ryegrass
Festuca sp.	fescue
Ficus carica	common fig
Fraxinus sp.	ash
Galium aparine	cleavers
Galium parisiense	wall bedstraw
Geranium dissectum	cut-leaved geranium
Geranium molle	dove’s-foot geranium
Gilia achilleifolia subsp. achilleifolia	California gilia
~~*Gilia capitata* subsp. *staminea*~~	~~bluehead gilia~~
Gilia clivorum	purplespot gilia
~~*Gilia minor*~~	~~little gilia~~
Gilia tricolor subsp. *tricolor*	bird’s-eye gilia
Glycyrrhiza lepidota	wild licorice
Grindelia camporum	Great Valley gumplant
Gutierrezia californica	California matchweed
Helianthus annuus	common sunflower
Heliotropium curassavicum	salt heliotrope
Herniaria hirsuta subsp. *cinerea*	rupturewort
Hesperevax sparsiflora var. *sparsiflora*	erect evax
Hirschfeldia incana	Mediterranean mustard
Holocarpha heermannii	Heermann's tarweed
Holocarpha obconica	San Joaquin tarweed
Hordeum brachyantherum	meadow barley
Hordeum marinum subsp. *gussoneanum*	Mediterranean barley
Hordeum murinum subsp. *leporinum*	foxtail barley
Hypochaeris glabra	smooth cat’s-ear
Juncus balticus	Baltic rush
Juncus bufonius	toad rush
Juniperus californica	California juniper
Koeleria gerardi	Mediterranean grass
Lactuca saligna	willow lettuce
Lactuca serriola	prickly lettuce
Lagophylla ramosissima	common hareleaf

Lamarckia aurea	goldentop
Lasthenia microglossa	small-rayed goldfields
Lasthenia minor	smooth goldfields
Lepidium draba	whitetop
Lepidium nitidum	shining peppergrass
Lepidium latifolium	perennial peppercress
~~*Leptosiphon ambiguus*~~	~~serpentine leptosiphon~~
Leptosiphon bicolor	true babystars
Leptosiphon ciliatus	whiskerbrush
~~*Lessingia pectinata* var. *tenuipes*~~	~~sticky lessingia~~
Logfia ~~sp.~~filaginoides	California cottonrose
Logfia gallica	daggerleaf cottonrose
Lomatium utriculatum	common lomatium
Lotus corniculatus	bird's-foot trefoil
~~*Linanthus dichotomus* subsp. *dichotomus*~~	~~evening snow~~
Lupinus ~~sp.~~*albifrons*	bush lupine
Lupinus bicolor	miniature lupine
Lupinus microcarpus var. densiflorus	milk lupine
Lupinus succulentus	arroyo lupine
Lysimachia arvensis	scarlet pimpernel
Malacothamnus fremontii	Fremont’s bush mallow
Malva parviflora	cheeseweed
Malvella leprosa	alkali mallow
Marah fabacea	California manroot
Marrubium vulgare	horehound
Matricaria discoidea	pineapple weed
Medicago polymorpha	bur clover
Melia azedarach	Chinaberry tree
Melica californica	California melic
Melilotus albus	white sweetclover
Melilotus indicus	sourclover
Mentzelia affinis	yellow blazing star
Micropus californicus	Q-tips
~~*Microseris sylvatica*~~	~~sylvan scorzonella~~
~~*Mucronea perfoliata*~~	~~perfoliate spineflower~~
Microseris douglasii	Douglas’ silverpuffs
Microsteris gracilis	slender phlox
Monardella villosa	coyote-mint
Monolopia major	cupped monolopia
Navarretia pubescens	downy navarretia
Nicotiana glauca	tree tobacco

Nuttallanthus texana	blue toadflax
Olea europaea	olive
Oxalis pes-caprae	Bermuda buttercup
Panicum capillare	witch grass
Papaver heterophyllum	wind poppy
Pectocarya penicillata	northern pectocarya
Pectocarya pusilla	little pectocarya
Pellaea andromedifolia	coffee fern
Pellaea mucronata	bird's-foot fern
Pentagramma triangularis	gold-back fern
Phacelia breweri	Brewer's phacelia
Phacelia distans~~sp.~~	common phacelia
Phacelia imbricata	imbricate phacelia
Phacelia tanacetifolia	tansy-leaf phacelia
Phalaris paradoxa	hood canarygrass
Phoenix canariensis	Canary Island palm
Pholistoma membranaceum	white fiesta flower
Phoradendron leucarpum subsp. *macrophyllum*	big-leaf mistletoe
Phragmites australis	common reed
Plagiobothrys acanthocarpus	adobe popcornflower
Plagiobothrys bracteatus	bracted popcornflower
Plagiobothrys canescens	valley popcornflower
Plagiobothrys fulvus var. *campestris*	field popcornflower
Plagiobothrys leptocladus	alkali popcornflower
Plagiobothrys stipitatus	stipitate popcornflower
Plagiobothrys tenellus	Pacific popcornflower
Plagiobothrys trachycarpus	rough-nutlet popcornflower
Plantago erecta	California plantain
Plectritis ciliosa	long-spurred plectritis
Plectritis macrocera	long-horn plectritis
Poa annua	annual bluegrass
Poa bulbosa	bulbous bluegrass
Poa secunda subsp. *secunda*	pine bluegrass
Polygonum aviculare	common knotweed
Polypogon monspeliensis	annual rabbit's-foot grass
Populus fremontii	Fremont cottonwood
Proboscidea louisianica subsp. *louisianica*	common devil's-claw
Prunus sp.	peach/plum
Psilocarphus tenellus	slender woolly-marbles
Pterostegia drymarioides	woodland threadstem
Puccinellia simplex	California alkali grass

Quercus douglasii	blue oak
Ranunculus hebecarpus	delicate buttercup
Raphanus sativus	wild radish
Robinia pseudoacacia	black locust
Rumex californicus	Californica dock
Rumex crispus	curly dock
Salix laevigata	red willow
Salsola australis	Russian thistle
Salvia mellifera	black sage
Sambucus nigra	blue elderberry
Sanicula bipinnata	poison sanicle
Sanicula bipinnatifida	purple sanicle
Schinus molle	pepper tree
Schismus arabicus	Mediterranean grass
Schoenoplectus americanus	Olney's three-square bulrush
Schoenoplectus pungens var. *longispicatus*	common three-square bulrush
Schoenoplectus robustus	alkali bulrush
Scrophularia californica	California beeplant
Scutellaria tuberosa	Danny's skullcap
Senecio vulgaris	common groundsel
Silene antirrhina	snapdragon catchfly
Silene gallica	common catchfly
Silybum marianum	milk thistle
Sisymbrium irio	London rocket
Sisymbrium orientale	oriental mustard
Solanum nigrum~~sp.~~	black nightshade
Solanum umbelliferum	blue witch nightshade
Sonchus asper	prickly sow-thistle
Sorghum halepense	Johnson grass
Spergularia bocconii	Boccone’s sand-spurry
Spergularia marina	saltmarsh sand-spurry
Stebbinsoseris heterocarpa	Santa Cruz microseris
Stellaria media	common chickweed
Stellaria nitens	shining chickweed
Stellaria pallida	lesser chickweed
Stephanomeria virgata subsp. *pleurocarpa*	wand wirelettuce
Stipa cernua	nodding needlegrass
Stipa miliacea	smilo grass
~~*Stipa pulchra*~~	~~purple needlegrass~~
Tamarix ramosissima	saltcedar
~~*Tetrapteron graciliflorum*~~	~~hill suncup~~

Thysanocarpus curvipes var. *curvipes*	lacepod
Torilis arvensis	field hedge parsely
Torilis nodosa	knotted hedge parsely
Toxicodendron diversilobum	poison-oak
Tribulus terrestris	puncture-vine
Trichostema lanceolatum	vinegar curls
Trifolium albopurpureum	Rancheria clover
Trifolium ciliolatum	foothill clover
Trifolium depauperatum var. truncatum	dwarf sack clover
Trifolium gracilentum	pinpoint clover
Trifolium microcephalum	small-headed clover
Trifolium oliganthum	few-flowered clover
Trifolium variegatum	white-tipped clover
Trifolium willdenovii	tomcat clover
Triteleia laxa	Ithuriel's spear
Typha domingensis	southern cattail
Tropidocarpum gracile	daggerpod
Uropappus lindleyi	silverpuffs
Urtica dioica subsp*. holosericea*	hoary nettle
Urtica urens	dwarf nettle
Verbascum thapsus	woolly mullein
Verbena bracteata	bracted vervain
Verbena lasiostachys	western vervain
Veronica anagallis-aquatica	water speedwell
Veronica peregrina	purslane speedwell
Vicia villosa subsp*. varia*	winter vetch
Washingtonia sp.	fan palm
Xanthium strumarium	common cocklebur
Yabea microcarpra	California hedge-parsely
Zeltnera muehlenbergii	Monterey centaury

Scientific Name	**Common Name**
Amphibians	
Lithobates catesbeianus	Bullfrog
Pseudacris sierra	Sierran tree frog
Anaxyrus boreas	Western toad Unidentified tadpoles
Reptiles	
Lampropeltis californiae	California king snake
Pituophis catenifer	Gopher snake
Crotalus oreganus	Rattlesnake
Uta stansburiana	Side-blotched lizard

Sceloporus occidentalis	Western fence lizard
Birds	
Corvus brachyrhynchos	American Crow
Spinus tristis	American Goldfinch
Falco sparverius	American Kestrel
Calypte anna	Anna's Hummingbird
Myiarchus cinerascens	Ash-throated Flycatcher
Haliaeetus leucocephalus	Bald Eagle
Tyto alba	Barn Owl
Hirundo rustica	Barn Swallow
Megaceryle alcyon	Belted Kingfisher
Sayornis nigricans	Black Phoebe
Pheucticus melanocephalus	Black-headed Grosbeak
Euphagus cyanocephalus	Brewer’s Blackbird
Molothrus ater	Brown-headed Cowbird
Icterus bullockii	Bullock's Oriole
Psaltriparus minimus	Bushtit
Callipepla californica	California Quail
Aphelocoma californica	California Scrub-Jay
Toxostoma redivivum	California thrasher
Melozone crissalis	California Towhee
Petrochelidon pyrrhonota	Cliff Swallow
Corvus corax	Common Raven
Geothlypis trichas	Common Yellowthroat
Streptopelia decaocto	Eurasian Collared-Dove
Salpinctes obsoletus	European Starling
Aquila chrysaetos	Golden Eagle
Ardea Herodias	Great blue heron
Bubo virginianus	Great Horned Owl
Butorides virescens	Green Heron
Eremophila alpestris	Horned Lark
Haemorhous mexicanus	House Finch
Charadrius vociferous	Killdeer
Chondestes grammacus	Lark Sparrow
Spinus psaltria	Lesser Goldfinch
Lanius ludovicianus	Loggerhead Shrike
Anas platyrhynchos	Mallard
Tadarida brasiliensis	Mexican free-tailed bat
Zenaida macroura	Mourning Dove
Colaptes auratus	Northern Flicker
Mimus polyglottos	Northern Mockingbirds
Stelgidopteryx serripenni	Northern Rough-winged
Dryobates nuttallii	Swallow Nuttall's Woodpecker

Phainopepla nitens	Phainopepla
Buteo jamaicensis	Red-tailed Hawk
Agelaius phoeniceus	Red-winged Blackbird
Columba livia (Feral Pigeon)	Rock Pigeon (Feral Pigeon)
Salpinctes obsoletus	Rock Wren
Passerculus sandwichensis	Savannah Sparrow
Sayornis saya	Say's Phoebe
Buteo swainsoni	Swainson's Hawk
Cathartes aura	Turkey Vulture
Tyrannus verticalis	Western Kingbird
Sturnella neglecta	Western Meadowlark
Piranga ludoviciana	Western Tanager
Sitta carolinensis	White-breasted Nuthatch
Aeronautes saxatalis	White-throated Swift
Pica nuttalli	Yellow-billed Magpie
Setophaga coronata	Yellow-rumped Warbler
Mammals	
Taxidea taxus	American badger (sign)
Spermophilus beecheyi	California ground squirrel
Sylvilagus sp.	Cottontail
Canis latrans	Coyote
Sus scrofa	Wild pig

APPENDIX B3: Memorandum regarding Special-Status Plant Assessment–Del Puerto Canyon Reservoir Project

Memorandum

To: Project File (00268.19)

From: Robert Preston, PhD.
Project Botanist

Date: ~~November 18, 2019~~ April 22, 2020

Re: Special-Status Plant Assessment–Del Puerto Canyon Reservoir Project

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This memorandum provides an assessment of the special-status plants that could be affected by the proposed Del Puerto Canyon Reservoir project in Stanislaus County. The study area for this assessment consists of the proposed reservoir and dam footprint and other project features associated with water conveyance, access, utility relocations, and road relocation. ~~Because no special-status plant surveys have been conducted of the study area, t~~ This assessment reviews the existing information available for the study area, presents the results of wetlands and botanical surveys conducted in 2019 and 2020, and identifies the potential for impacts on special-status plants.

In summary, thirty-five special-status plants occur in or within the vicinity (15 miles) of the study area. Eighteen of the species are not known to occur in the study area, and no potential habitat for these species is present in the study area. ~~Four of the species have been recorded from the study area and two species have been recorded in or near the study area. Fifteen~~Fourteen other species have ~~not been reported from the study area but have the potential to occur in the study area, based on the presence of~~ potentially suitable habitat in the study area but were not observed during the botanical surveys. Three special-status plants were located in the study area during the botanical surveys.

Methods

Review of Existing Information

ICF botanist Dr. Robert Preston, PhD., conducted a search of the California Natural Diversity Database (CNDDB 2019) for special-status plants on the Patterson U.S. Geological Survey 7.5-minute quadrangle and adjacent quadrangles (Solyo, Westly, Brush Lake, Copper Mountain, Crows Landing, Wilcox Ridge, Orestimba Peak, Newman) and a search of the California Native Plant Society (CNPS 2019) Inventory of Rare and Endangered Plants for the same quadrangles. The CNDDB and CNPS records searches were used to create a table of special-status plants that have the potential to occur in the study area.

A delineation of waters of the United States and Waters of the State was done by ICF biologists on June 17–20, 2019, and July 26, 2019. During the delineation survey, incidental observations of common plant species and of two special-status species were made.

Land cover types were digitized using Google Earth aerial imagery from August 31, 2018 (Google 2019). The draft habitat map was saved as a kmz file and converted into a shape file in ArcGIS. Land cover was classified according the dominant vegetation evident in the images. Where possible, natural community components were identified within the land cover types, generally following the California Natural Community List (California Department of Fish and Wildlife 2018).

Fall Survey

ICF botanists Robert Preston and Devin Jokerst conducted a botanical survey for late summer blooming plants at the study area on October 28–30, 2019. The botanists walked survey transects across the lower elevations of the study area (below 650 feet) where grasslands were present. All plants encountered were identified to species. When big tarplant was encountered, the plants were mapped using gps data recorders. All big tarplant individuals were counted in the smaller polygons (< 0.1 acre). The number of plants in the larger polygons was estimated, based on the density of plants counted in the smaller polygons.

Spring Survey

ICF Botanists Robert Preston, Devin Jokerst, Renee Richardson, Kate Carpenter, and Lisa Webber conducted a botanical survey for spring blooming plants at the study area between March 26 and April 8, 2020. The botanists walked survey transects across all parts of the study area and identified all plants encountered to species. Special-status plants encountered were mapped using an iPad data recorder.

Survey Limitations

Precipitation for the study area during the 2018–2019 rainfall year was close to normal, and average monthly temperatures were about 3°F higher than normal (AccuWeather 2019). Therefore, growing conditions in the study area during the fall survey were ~~expected to be~~ near normal and not drought-affected. Although many spring- and -summer-blooming plants were still identifiable, many were not~~., and spring- and summer-blooming special-status plants were assumed to be neither evident nor identifiable. Therefore, no findings regarding spring- or summer-blooming special-status species are made in this report. The only special-status plant presumed to be evident and identifiable during the fall survey was big tarplant.~~

Precipitation for the study area during the 2019-2020 rainfall year was 78% of normal; in particular, rainfall in January and February 2020 was 14% of normal (AccuWeather 2020). Consequently, much of the herbaceous vegetation in the grasslands was short and sparse, consisting mostly of non-native grasses and filaree (*Erodium* spp.). On south-facing slopes, some annual vegetation had already dried. In contrast, vegetation on north-facing slopes and northeast-facing slopes was still green and growing, with greater abundance of native species. Although many species were identified during the spring survey, most species were present at low numbers and cover. Therefore, it is possible that some species would have been less evident or not evident in the grasslands or on the south-facing and east-facing slopes during the spring survey.

Results

The study area is in the foothills of the Diablo Range west of the city of Patterson, in Stanislaus County. It is characterized by rolling hills, generally sloping from west to east. Elevations range from about 650 feet along the west side to 180 feet near I-5. The defining feature of the study area is Del Puerto Creek, an intermittent stream that is tributary to the San Joaquin River. The stream flows primarily during the winter and spring, and some stream reaches are dry during the summer and fall. Other reaches are supported by groundwater and remain inundated or saturated throughout the year, supporting riparian woodland and wetlands.

The climate in the study area is characterized by hot, dry summers and cool, wet winters. The average high temperatures range from 96.1°F in July to 55.4°F in January, and the average low temperatures range from 35.5°F in December to 59.5°F in July (Natural Resources Conservation Service 2019). The average annual precipitation is 11.52 inches, with precipitation falling entirely as rain, mostly between October and April.

Vegetation Types

The survey area is predominantly vegetated by natural vegetation, and eleven vegetation types were mapped from aerial photographs of the survey area. The vegetation types are listed in Table 1, which provides area estimates for each type. The most abundant plant community is grassland, with areas of coastal scrub and blue oak woodland in the steep canyons of the west side of the survey areas.

Riparian woodland and wetlands are present along Del Puerto Creek, and a few small ponds, seasonal seeps, and isolated seasonal wetlands are scattered across the survey area. Orchards, most of which have been abandoned, are present on the east side of the study area. The vegetation types and associated plants are described below.

Grassland

Most of the study area vegetation consists of grassland, an herbaceous community dominated by naturalized annual grasses intermixed with other native and naturalized perennial and annual grasses and forbs. Flowering forbs are often a conspicuous component of the plant cover. Grassland is found throughout the study area, occupying about 1,545 acres. The dominant species are naturalized annual grasses, especially bromes (*Bromus* spp.), fescues (*Festuca* spp.), and wild oats (*Avena* spp.), and filaree (Erodium spp.). The typical vegetation alliance associated with this type of grassland is Annual Brome Grasslands (Sawyer et al. 2009, p. 784), although other grass and forb dominated alliances are likely to be present.

Coastal Scrub

Coastal Scrub is a shrub-dominated community occurring in the Coast Ranges within the area having a maritime influence on the climate. Coastal scrub is present on steep slopes in the western side of the survey area, occupying about 98 acres. At least two vegetation alliances are present, California Sagebrush Scrub and Black Sage Scrub (Sawyer et al. 2009, pp. 392 and 706). California Sagebrush Scrub, dominated by California sagebrush (*Artemisia californica*), occurs primarily on north-facing slopes in the study area. Black Sage Scrub, dominated by black sage (*Salvia mellifera*), occurs primarily on south-facing slopes in the survey area. Other shrubs present in coastal scrub habitat in the survey area include California wild buckwheat (*Eriogonum fasciculatum*), yellow mock aster (*Eastwoodia elegans*), bush monkeyflower (*Diplacus aurantiacus*), California matchweed (*Gutierrezia californica*), interior goldenbush (*Isocoma linearifolia*), Fremont's bush mallow (*Malacothamnus fremontii*), and poison-oak (*Toxicodendron diversilobum*). The coastal scrub on the north side of the study area burned in a 2020 wildfire, but many shrub seedlings and resprouts were observed during the spring botanical survey.

Blue Oak Woodland

Blue oak woodland is the common oak woodland alliance occurring in the foothills adjacent to the Central Valley (Sawyer et al. 2009, p 252). In the study area, blue oak (*Quercus douglasii*) is the dominant tree species, and California juniper (*Juniperus californica*) and buckeye (*Aesculus californica*) are also present at scattered locations. Two blue oak associations are present in the study area. Blue oak woodland with an understory consisting primarily of grasses and forbs occupies about 26 acres. Blue oak woodland with a well-developed shrub layer of coastal scrub species is more extensive, occupying about 53 acres.

Riparian Woodland

Sections of Del Puerto Creek where trees are present were mapped as Riparian Woodland. This vegetation type occupies about 17 acres, primarily in the western part of the study area. Fremont cottonwood (*Populus fremontii*) is the dominant canopy tree. Associated canopy species include red willow (*Salix laevigata*), and associated understory shrubs include mule fat (*Baccharis salicifolia*) and tree tobacco (*Nicotiana glauca*). The corresponding vegetation alliance for this community is Fremont cottonwood forest (Sawyer et al. 2009, p. 215).

Riparian Wetlands

Riparian wetlands are present in the channel of Del Puerto Creek and along the banks, within the floodplain. Approximately 24 acres of riparian wetlands are present in the study area. These wetlands are primarily characterized by herbaceous plants. Deeper portions of the channel may be vegetated with cattails (*Typha domingensis*) and three-square bulrush (*Schoenoplectus americanus*, *S. pungens*). Meadow is present along the stream margins, below the ordinary high water mark. The meadow is dominated by Bermuda grass (*Cynodon dactylon*) and annual rabbit's-foot grass (*Polypogon monspeliensis*), but three-square bulrush, Baltic rush (*Juncus balticus*), saltgrass (*Distichlis spicata*), and birds'-foot trefoil (*Lotus corniculatus*) are also common associates. Del Puerto Creek is an intermittent stream containing several pools that remain inundated into late summer due to subsurface flows and seeps along Del Puerto Canyon. A smaller seasonal stream that is tributary to Del Puerto Creek is present in the central part of the study area. This stream has wetland vegetation along the channel like that present along the margins of Del Puerto Creek, but it appears to have seasonal flows only.

Seep Wetlands

Seep wetlands are present at scattered intervals along the channels of ephemeral drainages, mostly in the west half of the study area. These drainages lack evidence of prolonged stream flow, such as scour or a well-defined bed and banks, but at some locations along the channels, groundwater-supported seeps are present. The vegetation is dominated by saltgrass, but many of the wetland associates present along Del Puerto Creek are also present in the seeps. Other wetland species in the seeps include salt heliotrope (*Heliotropium curassavicum*), creeping wildrye (*Elymus triticoides*), common reed (*Phragmites australis*), and saltmarsh sand-spurry (*Spergularia marina*). About 1.8 acre of seep wetlands are present in the study area.

Ponds

Four ponds were identified in the study area consisting of approximately 0.6 acres. Three of these ponds are inundated during the rainy season and are dry during the dry season. They are relatively shallow and were observed dry by the time of the May 2019 surveys. One of these ponds is a natural sag pond, whereas the other two are stock ponds formed by placing dams across swales. The fourth stock pond was observed inundated during the July 22, 2019 field visit. The sag pond and one stock pond (the one inundated into July) are unvegetated, but two stock ponds are vegetated by annual species, including annual rabbit's-foot grass, swamp timothy (*Crypsis schoenoides*), alkali mallow (*Malvella leprosa*), and curly dock (*Rumex crispus*).

Seasonal Wetlands

Seasonal wetlands are freshwater wetlands that support ponded or saturated soil conditions during winter and spring and are dry through the summer and fall until winter rainfall begins to saturate the soil. About 1 acre of seasonal wetlands were identified in the study area during the wetland delineation survey. A large seasonal wetland is located along Del Puerto Canyon Road at the eastern edge of the study area. The dominant species are cleistogamous spike-primrose (*Epilobium cleistogamum*), swamp timothy, Mediterranean barley (*Hordeum marinum*), and common knotweed (*Polygonum aviculare*). Based on the presence of vernal pool species, including two spike-primrose species (*Epilobium* spp.) and three popcornflower species (*Plagiobothrys* spp.), this may represent the disturbed remnant of a vernal pool. Several other small, shallow seasonal wetlands are present along Del Puerto Canyon road where water collects during the winter rains. These seasonal wetlands support annual native and non-native wetland species, including swamp timothy, Mediterranean barley, and Italian ryegrass (*Festuca perennis*). During the dry season, dove weed (*Croton setiger*) and tumbleweed (*Amaranthus albus*) become established.

Ornamental Trees

Several small stands of ornamental trees are present in the study area, near the former California Department of Forestry station and adjacent to the orchards. These trees include blue gum (*Eucalyptus globulus*), pepper tree (*Schinus molle*), and Chinaberry tree (*Melia azedarach*). These stands total about 3 acres.

Orchards

Much of the study area adjacent to and east of Interstate has been planted to orchard crops. Orchards were also planted west of the mouth of Del Puerto Canyon, starting in 2008; however, these orchards have not been maintained, and most of the trees have died. Orchards occupy about 318 acres of the survey area.

Unvegetated Areas

While most of the study area is undeveloped and vegetated, there are some areas that are developed with either roads, buildings or canals. Paved roads in the study area include I-5 and Del Puerto Canyon Road. Interstate 5 is a four-lane divided highway with unpaved shoulders and a mown median strip. Del Puerto Canyon Road is a two-lane road with a very narrow shoulder. These roads total about 19 acres.

One building is present at the site of the former Del Puerto Fire Control Station. An old water tower and livestock corrals are associated with this building. The building and corrals total about 1.6 acre. Two canals cross the east end of the study area, the California Aqueduct and the Delta-Mendota Canal. Both canals have concrete-lined banks and have unpaved access roads along both banks. These canals comprise about 17 acres, of which about 4.8 acres are open water.

Natural Communities of Special Concern

Natural Communities of Special Concern (Sensitive Natural Communities) are plant communities and habitat types that have been evaluated by California Department of Fish and Wildlife and identified for evaluation in the environmental review processes of CEQA. These communities have been identified as being of special concern on the basis of rarity and threats. In the study area, riparian woodland and wetlands are considered to be natural communities of special concern. No other natural communities of special concern were identified during the botanical surveys.

Flora

A total of ~~196~~ 297 plant species were observed during the Aquatic Resources Delineation Survey and the fall and spring botanical surveys (Table 2). ~~, or~~ Another 41 species have been collected in or near the study area but were not observed during the surveys (Table 3) (California Consortium of Herbaria 2019). Some or all of the species in Table 3 may not have evident because of the below-normal rainfall in January and February. In addition, a number of fire-followers were observed in the areas of coastal scrub that burned during a 2019 wildfire: whispering bells (*Emmenanthe penduliflora*), California primrose (*Eulobus californicus*), intermediate primrose (*Camissoniopsis intermedia*), coastal lotus (*Acmispon maritimus*), and snapdragon catchfly (*Silene antirrhina*). Fire-followers are plants that depend on fire to complete their life cycle and are often not evident in an area except following fire. Neither California primrose nor coastal lotus have been previously reported from in Stanislaus County. ~~A list of these plant species is provided in Table 2.~~

Special-Status Plants

Special-status plants are defined as species that are legally protected under the Endangered Species Act (ESA), the California Endangered Species Act (CESA), or other regulations, and species that are considered sufficiently rare by the scientific community to qualify for such listing. Special-status plants are those species in any of the categories listed below.

- Species listed or proposed for listing as threatened or endangered under ESA (50 CFR 17.12) and various notices in the Federal Register (proposed species).
- Species that are candidates for possible future listing as threatened or endangered under ESA (81 FR 87246, December 2, 2016).
- Species listed or proposed for listing by the State of California as threatened or endangered under CESA (14 CCR 670.5).
- Plants listed as rare under the California Native Plant Protection Act (CFGC 1900 et seq.).
- Plants with a California Rare Plant Rank (CRPR) of 1 and 2, and plants with a CRPR of 4 that may be locally significant (California Department of Fish and Wildlife 2019).

Thirty-five special-status plants occur in or within the vicinity (15 miles) of the study area (Table ~~3~~4). ~~No spring or summer surveys for special-status plants have been done within the study area; therefore, except for big tarplant, all~~All species present in the study area vicinity were initially evaluated for their potential to occur in the study area, based on the known range of each species and their habitat associations. ~~Fourteen~~ Eighteen of the species are not known to occur in the study area, and no potential habitat for these species is present in the study area. These species are not addressed further. The following discussion focuses on the ~~21~~ seventeen species that occur in the study area or that have the potential to occur in the study area.

Santa Clara Thorn Mint

Santa Clara thorn mint has no federal or state listing status but has a California Rare plant Rank of 4.2. It is endemic to the Diablo Ranges, occurring from Alameda County to Fresno County. It inhabits woodland and chaparral plant communities, where it occurs on rocky slopes and outcrops. There are three or four occurrences in Stanislaus County. It is not known to occur in the study area, but it has been collected in upper Del Puerto Canyon. Potential habitat for this species is present in the Blue oak woodland and coastal scrub at the west end of the study area. This species was not observed during the botanical surveys and is presumed to be absent from the study area.

Red-flowered Bird's-foot Trefoil

Red-flowered bird's-foot trefoil has no federal or state listing status but has a California Rare plant Rank of 1B.1. It is known from only eight occurrences, two of which are in western Stanislaus County. It inhabits open grassy areas in oak woodland. There are eight known occurrences, two of which are in Stanislaus County. It is not known to occur in the study area, but occurrences are known in upper Del Puerto Canyon. Potential habitat for this species is present in the Blue oak woodland at the west end of the study area and within the road relocation area. This species was not observed during the botanical surveys and is presumed to be absent from the study area.

Large-Flowered Fiddleneck

Large-flowered fiddleneck is state- and federally listed as endangered, with a California Rare Plant Rank of 1B.1. Historically, it was known from the Mount Diablo foothills in Contra Costa, Alameda, and San Joaquin Counties, but it is currently known only from two natural occurrences near Corral Hollow Road in San Joaquin County. Large-flowered fiddleneck grows in grasslands, generally on north-facing slopes. It is not known to occur in the study area, but an occurrence is present 15 miles northwest of the study area. Grassland in the study area are potential habitat for this species. Although four other fiddleneck species were common throughout the study area, large-flowered fiddleneck was not observed during the botanical surveys and is presumed to be absent from the study area.

California androsace

California androsace has no federal or state listing status but has a California Rare Plant Rank of 4.2. It occurs throughout much of the California Floristic Province but at widely scattered locations, where it is locally rare. California androsace grows on moss-covered rock outcrops and adjacent open areas in grassland. There are three occurrences in Stanislaus County. It is been reported to occur in Del Puerto Canyon, in or near the study area. Potential habitat is present in the study area grassland. This species was not observed during the botanical surveys and is presumed to be absent from the study area.

Big Tarplant

Big tarplant has no state or federal listing status but has a California Rare Plant Rank of 1B.1. It ranges from the eastern San Francisco Bay Area to the northwestern San Joaquin Valley. Big tarplant occurs in annual grassland on clay to clay-loam soils, usually on slopes and often in burned areas, below 1,500 feet. There are 53 known occurrences, five of which are in Stanislaus County. Three occurrences have been reported from the study area, two along Del Puerto Canyon Road and a third along the gas pipeline that crosses the eastern edge of the study area.

During the fall survey, big tarplant was mapped at 54 locations in or adjacent to the study area. Plant density was about 580 plants per acre, for an estimated total of 35,309 plants (Table ~~4~~ 5). The stands ranged in size from a few square feet to over 7 acres, for a total of 60.9 acres of mapped occupied habitat. Of this total, 45.25 acres were located within the study area (Figure 1). All of the stands were found to occur south of Del Puerto Canyon Road. The results of this survey show that these big tarplant stands represent a single, large occurrence, rather than three separate occurrences. A native species survey form for the results of this survey is included as Attachment A.

A second big tarplant species, glandular big tarplant (*Blepharizonia laxa*), was also found in the study area. Glandular big tarplant is endemic to the inner South Coast Ranges but is common and not considered to have special status. Both big tarplant species were found growing together in a few locations, but glandular big tarplant generally occurred in drier microsites. All of the big tarplant individuals observed north of Del Puerto Canyon Road were glandular big tarplant.

~~Chaparral Harebell~~

~~Chaparral harebell has no state or federal listing status but has a California Rare Plant Rank of 1B.2. It is endemic to the Diablo Range, from Alameda County to Stanislaus County. The species inhabits rocky areas in chaparral, usually on serpentine soils. There are 50 known occurrences, 11 of which are in Stanislaus County. It is not known to occur in the study area, but it occurs in upper Del Puerto Canyon. Potential habitat is present in the study area and within the road relocation area.~~

Lemmon's Jewelflower

Lemmon's jewelflower has no state or federal listing status but has a California Rare Plant Rank of 1B.1. It ranges from the southeastern San Francisco Bay area south into the South Coast Ranges and adjacent San Joaquin Valley, from Alameda to Ventura Counties. Lemmon's jewelflower grows on dry exposed slopes in grasslands and pinyon-juniper woodlands, generally between 260 and 4,000 feet above sea level. There are 86 known occurrences, only one of which is in Stanislaus County. It was collected in the study area near the mouth of Del Puerto Canyon during the 1930s. ~~Although t~~The occurrence has not been relocated since the original collection~~, it is presumed to be extant.~~ This species was not observed during the botanical surveys. Because of the low late winter rainfall, the absence of this species cannot be definitively presumed from the results of this survey.

Brewer's clarkia

Brewer's clarkia has no federal or state listing status but has a California Rare Plant Rank of 4.2. It is endemic to the Diablo Range, from Alameda County to Stanislaus County. The species inhabits open areas in chaparral or oak woodland, often on serpentine soils. It is not known to occur in the study area, but it occurs in upper Del Puerto Canyon. Potential habitat is present in the study area and within the road relocation area. This species was not observed during the botanical surveys and is presumed to be absent from the study area.

Small-flowered Morning-glory

Small-flowered morning-glory has no federal or state listing status but has a California Rare Plant Rank of 4.2. It occurs throughout much of the California Floristic Province but at widely scattered locations, where it is locally rare. It grows in grassland and in openings in chaparral and coastal scrub. There are two known occurrences in Stanislaus County. It is not known to occur in the study area, but at least one occurrence is within 5 miles of the study area. Potential habitat is present in the study area. This species was not observed during the botanical surveys and is presumed to be absent from the study area.

Rattan's Cryptantha

Rattan's cryptantha has no federal or state listing status but has a California Rare Plant Rank of 4.3. It is endemic to the Inner Coast Ranges from Santa Clara and Stanislaus counties, south to Monterey County. It occurs on rocky or gravelly slopes in grassland, coastal scrub, chaparral, and oak woodland. It is been reported to occur in Del Puerto Canyon, in or near the study area. Potential habitat is present in the study area. This species was not observed during the botanical surveys and is presumed to be absent from the study area.

Hospital Canyon Larkspur

Hospital Canyon larkspur has no federal or state listing status but has a California Rare Plant Rank of 1B.2. It is endemic to the Diablo Range, ranging from Alameda County to Monterey County. It inhabits moist ravines and slopes in woodlands. There are 28 known occurrences, none of which are in Stanislaus County. It is not known to occur in the study area, but the nearest known occurrence is in Hospital Canyon, about 8 miles northwest of the study area. Potential habitat is present in the study area and within the road relocation area. This species was not observed during the botanical surveys and is presumed to be absent from the study area.

Spiny-sepaled button celery

Spiny-sepaled button-celery has no federal or state listing status but has a California Rare Pant Rank of 1B.2 It grows in vernal pools and other seasonal wetlands around the margins of the San Joaquin Valley from Fresno County to Contra Costa County. There are 108 occurrences, only two which are in Stanislaus County. The nearest occurrence is about 3 miles south of the study area, in the hills southwest of Patterson. Potential habitat in the study area is present in seasonal wetlands. This species was not observed during the botanical surveys and is presumed to be absent from the study area.

San Benito Poppy

San Benito poppy has no federal or state listing status but has a California Rare Plant Rank of 4.3. It is endemic to the inner South Cost Ranges. In inhabits grasslands and open areas in chaparral and oak woodland, on clay soils. Several collections have been reported from Del Puerto Canyon, in or near the study area~~. Potential habitat is present in the west side of the study area and within the road relocation area~~. San Benito poppy was mapped at three locations within the study area. A total of 45 plants were observed in a combined area of less than 0.01 acre.

Diamond-petaled California Poppy

Diamond-petaled California poppy has no state or federal listing status but has a California Rare Plant Rank of 1B.1. It ranges from the southeastern San Francisco Bay area south into the South Coast Ranges and adjacent San Joaquin Valley, from Alameda to San Luis Obispo counties. Diamond-petaled California poppy grows on clay soils in grasslands. There are twelve known occurrences, one of which is in Stanislaus County. It was last collected in the study area near the mouth of Del Puerto Canyon in 1940. ~~Although t~~ Efforts to relocate the occurrence have been unsuccessful, and the occurrence has not been ~~relocated~~ seen since the original collection (California Department of Fish and Wildlife 2019)~~, it is presumed to be extant~~. Because of the low late winter rainfall, the absence of this species cannot be definitively presumed from the results of this survey.

Showy Madia

Showy madia has no state or federal listing status but has a California Rare Plant Rank of 1B.1. It occurs at scattered locations in the inner South Coast Ranges from Contra Costa County to Ventura County. Showy madia grows in clay soils in grasslands and oak woodlands. There are 100 known occurrences, but no occurrences are in Stanislaus County. It is not known to occur in the study area, but the nearest known occurrences are 10 to 18 miles northwest of the study area. Potential habitat is present in the study area. Because of the low late winter rainfall, the absence of this species cannot be definitively presumed from the results of this survey.

Hall's Bush Mallow

Hall's bush mallow has no state or federal listing status but has a California Rare Plant Rank of 1B.2. It is endemic to the Diablo Range, ranging from Contra Costa to Merced counties. Hall's bush mallow grows in chaparral or coastal scrub. There are 36 known occurrences, two of which are in Stanislaus County. It is not known to occur in the study area, and the nearest known occurrences are 6 to 9 miles northwest of the study area. Potential habitat is present in the study area and within the road relocation area. This species was not observed during the botanical surveys and is presumed to be absent from the study area.

Shining Navarretia

Shining navarretia has no state or federal listing status but has a California Rare Plant Rank of 1B.2. It occurs in the foothills of the inner South Coast Ranges from Merced County to San Luis Obispo County. Shining navarretia inhabits grasslands and oak woodland in areas of heavy clay soil. There are 103 known occurrences, only one of which is in Stanislaus County. It is not known from the study area, but the nearest occurrence is about 3 miles south of the study area. Potential habitat is present in the west side of the study area and within the road relocation area. Because of the low late winter rainfall, the absence of this species cannot be definitively presumed from the results of this survey.

~~*San Benito Pentachaeta*~~

~~San Benito pentachaeta has no state or federal listing status but has a California Rare Plant Rank of 1B.2. It occurs at scattered locations in the San Francisco Bay Area and South Coast Ranges. It inhabits grasslands and the grassy understory of oak woodlands. There are 16 known occurrences, none of which are in Stanislaus County. It is not known from the study area, and the nearest occurrences are about 13 to 15 miles southwest of the study area. Potential habitat is present in the west side of the study area.~~

~~*Forget-me-not Popcornflower*~~

~~Forget-me-not popcornflower has no state or federal listing status but has a California Rare Plant Rank of 2B.1. In California, it is known from only four occurrences in the Mount Hamilton Range. It inhabits open areas in chaparral, on gravelly soils. There are four known occurrences in California, only one of which is in Stanislaus County. It is not known to occur in the study area, and the nearest known occurrence is about 10 miles west of the study area in upper Del Puerto Canyon. Potential habitat is present in the study area and within the road relocation area.~~

California Alkali Grass

California alkali grass has no state or federal listing status but has a California Rare Plant Rank of 1B.2. It occurs at scattered locations in the San Francisco Bay Area, Great Valley, Tehachapi Mountains, and the western Mojave Desert. The plants grow in seasonally wet alkaline wetlands, sinks, flats, vernal pools, and playa margins. There are 80 known occurrences, two of which are reported from Stanislaus County. A new, previously undocumented occurrence of California alkali grass was observed and mapped in the study area during the aquatic resources delineation survey.

Invasive Plant Species

Invasive plant species have the potential to adversely affect special-status plants through habitat degradation and direst competition. Invasive species occurring in the study area vicinity were determined from a search of the CalFlora database for CalIPC-listed invasive plant species (CalFlora 2019) and from the list of plant species observed in the study area (Table 2). Thirty of the plant species occurring in the study area were determined to be invasive plant species (Table ~~5~~ 6).

Recommendations

Because of the low late winter rainfall, the absence of several special-status species could not be established definitively. These species are Lemmon's jewelflower, diamond-petaled California poppy, showy madia, and shining navarretia. Surveys of the grasslands portions of the study area should be done in a year with normal or above-normal rainfall to be considered conclusive and to be able to determine the need for mitigation measures.

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Table 1: Land Cover Types in the Study Area and Approximate Acreages

Vegetation/Land Cover Type	Amount in Study Area (acres)
Grasslands	1,545
Blue Oak Woodland	26
Coastal Scrub	98
Blue Oak Woodland / Coastal Scrub	53
Riparian Woodland	17
Riparian Wetlands	24
Seeps	1.8
Seasonal Wetlands	1
Ponds	0.6
Ornamental Trees	3
Orchard	318
Unvegetated Areas	
Paved Roads	19
Canals	17

Table 2. Plant Species ~~Occurring or Reported from~~ Observed in the Study Area

Scientific Name	Common Name
Achillea millefolium	common yarrow
Achyrachaena mollis	blow-wives
Acmispon americanus	America bird's-foot trefoil
Acmispon glaber	deer broom
Acmispon maritimus var. *maritimus*	Coastal lotus
Acmispon strigosus	strigose lotus
Acmispon wrangelianus	Chilean trefoil
Aesculus californica	California buckeye
Agoseris heterophylla var. *heterophylla*	annual agoseris
Allium serra	jeweled onion
Amaranthus albus	tumbleweed
Amaranthus blitoides	procumbent pigweed
Amaranthus palmeri	Palmer's amaranth
Amsinckia eastwoodiae	Eastwood's fiddleneck
Amsinckia intermedia	common fiddleneck
Amsinckia lycopsoides	bugloss-flowered fiddleneck
Amsinckia menziesii	Menzies' fiddleneck
~~*Amsinckia tessellata var. gloriosa*~~	~~Carrizo fiddleneck~~
Anthemis cotula	Mayweed
Androsace elongata subsp. *acuta*	California rockjasmine
Artemisia californica	California sage brush
Artemisia douglasiana	mugwort
Asclepias californica	California milkweed
Asclepias fascicularis	narrow-leaved milkweed
Astragalus ~~sp.~~oxyphysus	Mt. Diablo milkvetch
~~*Athysanus unilateralis*~~	~~ladies-tongue mustard~~
Atriplex fruticulosa	ball saltscale
Atriplex serenana	saltscale
Avena barbata	slender wild oat
Avena fatua	wild oats
Baccharis pilularis	coyote brush
Baccharis salicifolia	mule fat
Bassia hyssopifolia	five-horned smotherweed
Blepharizonia laxa	glandular big tarplant
Blepharizonia plumose	big tarplant
~~*Bolboschoenus maritimus* subsp. *paludosus*~~	~~alkali bulrush~~
Bowlesia incana	hoary bowlesia
Bromus diandrus	ripgut brome

Scientific Name	Common Name
Bromus hordeaceus	soft chess
Bromus ~~madritensis~~ ~~subsp.~~ rubens	red brome
Bromus sterilis	poverty brome
Calandrinia menziesii	red maids
California macrophylla	round-leaved filaree
Calochortus venustus	butterfly mariposa lily
Camissoniopsis intermedia	intermediate sun cups
Capsella bursa pastoris	shepherd's-purse
Cardamine oligosperma	bitter cress
Carduus pycnocephalus	Italian thistle
Carduus tenuiflorus	slender-flowered thistle
Castilleja affinis subsp. *affinis*	coast paintbrush
Castilleja exserta	purple owl's-clover
Castilleja foliolosa	paintbrush
~~*Caulanthus flavescens*~~	~~yellow California mustard~~
Caulanthus lasiophyllus	California mustard
~~*Caulanthus lemmonii*~~	~~Lemmon's jewelflower~~
Centaurea calcitrapa	purple star-thistle
Centaurea melitensis	tocalote
Centaurea solstitialis	yellow star-thistle
Centromadia pungens	common spikeweed
Cerastium glomeratum	Sticky mouse-eared chickweed
Chenopodium album	lamb's-quarters
Chenopodium murale	nettle-leaf goosefoot
Chlorogalum pomeridianum	soap plant
Chorizanthe membranacea	pink spineflower
Cirsium vulgare	bull thistle
Clarkia affinis	chaparral clarkia
Clarkia tembloriensis subsp. *tembloriensis*	Temblor clarkia
Clarkia unguiculata	elegant clarkia
~~*Claytonia exigua* subsp. *exigua*~~	~~little springbeauty~~
Claytonia parviflora	narrow-leaved miner's lettuce
Claytonia perfoliata	miner's lettuce
Collinsia heterophylla	purple Chinese houses
Collinsia sparsiflora subsp. *collina*	hillside collinsia
Convolvulus arvensis	field bindweed
Cotula australis	Australian brass buttons
Crassula connate	pygmyweed
Croton setiger	dove weed
Crypsis alopecuroides	foxtail prickle grass

Scientific Name	Common Name
Crypsis schoenoides	swamp prickle grass
Cryptantha flaccida	beaked cryptantha
~~*Cryptantha nemaclada*~~	~~Colusa cryptantha~~
Cryptantha nevadensis var. *rigida*	rigid cryptantha
Cynodon dactylon	Bermuda grass
Datura wrightii	sacred thornapple
Daucus pusillus	rattlesnake weed
Deinandra kelloggii	Kellogg's tarweed
Delphinium patens subsp. *patens*	spreading larkspur
Delphinium spp.	larkspur species
Diplacus aurantiacus	bush monkeyflower
Dipterostemon capitatus	blue dicks
Distichlis spicata	saltgrass
Dittrichia graveolens	stinkweed
Eastwoodia elegans	yellow mock aster
Eleocharis parishii	Parish's spikerush
Elymus triticoides	creeping wildrye
Emmenanthe penduliflora var. *penduliflora*	whispering bells
Epilobium brachycarpum	panicled willowherb
Epilobium campestre	smooth spike-primrose
Epilobium canum	California fuschia
Epilobium cleistogamum	cleistogamous spike-primrose
Eremalche parryi	Parry's mallow
Ericameria linearifolia	Interior goldenbush
Erigeron bonariensis	South American horseweed
Erigeron canadensis	Canadian horseweed
Eriodictyon californicum	California yerba santa
Eriogonum angulosum	angle-stem wild buckwheat
Eriogonum fasciculatum var. *polifolium*	California wild buckwheat
Eriogonum gracile var. gracile	slender wild buckwheat
Eriogonum nudum var. *auriculatum*	naked wild buckwheat
Eriogonum nudum var. *pubiflorum*	Fremont's wild buckwheat
Erodium botrys	big heronbill
Erodium brachycarpum	foothill filaree
Erodium cicutarium	red-stemmed filaree
Erodium moschatum	white-stemmed filaree
Erythranthe guttata	seep-spring monkeyflower
Eschscholzia californica	California poppy
Eschscholzia hypecoides	San Benito poppy
~~*Eschscholzia rhombipetala*~~	~~diamond-petaled California poppy~~

Scientific Name	**Common Name**
Eucalyptus camaldulensis	red gum
Eucalyptus globulus	blue gum
Eulobus californicus	California primrose
Euphorbia maculata	spotted spurge
Euphorbia ocellata subsp. *ocellata*	valley spurge
Euphorbia serpyllifolia subsp. *serpyllifolia*	thyme-leaved spurge
Euphorbia spathulata	warty spurge
Euthamia occidentalis	western goldenrod
Festuca microstachys	small fescue
Festuca myuros	foxtail fescue
Festuca perennis	Italian ryegrass
Festuca sp.	fescue
Ficus carica	common fig
Fraxinus sp.	ash
Galium aparine	cleavers
Galium parisiense	wall bedstraw
Geranium dissectum	cut-leaved geranium
Geranium molle	dove’s-foot geranium
Gilia achilleifolia subsp. achilleifolia	California gilia
~~*Gilia capitata* subsp. *staminea*~~	~~bluehead gilia~~
Gilia clivorum	purplespot gilia
~~*Gilia minor*~~	~~little gilia~~
Gilia tricolor subsp. *tricolor*	bird’s-eye gilia
Glycyrrhiza lepidota	wild licorice
Grindelia camporum	Great Valley gumplant
Gutierrezia californica	California matchweed
Helianthus annuus	common sunflower
Heliotropium curassavicum	salt heliotrope
Herniaria hirsuta subsp. *cinerea*	rupturewort
Hesperevax sparsiflora var. *sparsiflora*	erect evax
Hirschfeldia incana	Mediterranean mustard
Holocarpha heermannii	Heermann's tarweed
Holocarpha obconica	San Joaquin tarweed
Hordeum brachyantherum	meadow barley
Hordeum marinum subsp. *gussoneanum*	Mediterranean barley
Hordeum murinum subsp. *leporinum*	foxtail barley
Hypochaeris glabra	smooth cat’s-ear
Juncus balticus	Baltic rush
Juncus bufonius	toad rush
Juniperus californica	California juniper

Scientific Name	**Common Name**
Koeleria gerardi	Mediterranean grass
Lactuca saligna	willow lettuce
Lactuca serriola	prickly lettuce
Lagophylla ramosissima	common hareleaf
Lamarckia aurea	goldentop
Lasthenia microglossa	small-rayed goldfields
Lasthenia minor	smooth goldfields
Lepidium draba	whitetop
Lepidium nitidum	shining peppergrass
Lepidium latifolium	perennial peppercress
~~*Leptosiphon ambiguus*~~	~~serpentine leptosiphon~~
Leptosiphon bicolor	true babystars
Leptosiphon ciliatus	whiskerbrush
~~*Lessingia pectinata var. tenuipes*~~	~~sticky lessingia~~
Logfia ~~sp.~~filaginoides	California cottonrose
Logfia gallica	daggerleaf cottonrose
Lomatium utriculatum	common lomatium
Lotus corniculatus	bird's-foot trefoil
~~*Linanthus dichotomus* subsp. *dichotomus*~~	~~evening snow~~
Lupinus ~~sp.~~*albifrons*	bush lupine
Lupinus bicolor	miniature lupine
Lupinus microcarpus var. densiflorus	milk lupine
Lupinus succulentus	arroyo lupine
Lysimachia arvensis	scarlet pimpernel
Malacothamnus fremontii	Fremont’s bush mallow
Malva parviflora	cheeseweed
Malvella leprosa	alkali mallow
Marah fabacea	California manroot
Marrubium vulgare	horehound
Matricaria discoidea	pineapple weed
Medicago polymorpha	bur clover
Melia azedarach	Chinaberry tree
Melica californica	California melic
Melilotus albus	white sweetclover
Melilotus indicus	sourclover
Mentzelia affinis	yellow blazing star
Micropus californicus	Q-tips
~~*Microseris sylvatica*~~	~~sylvan scorzonella~~
~~*Mucronea perfoliata*~~	~~perfoliate spineflower~~
Microseris douglasii	Douglas’ silverpuffs

Scientific Name	Common Name
Microsteris gracilis	slender phlox
Monardella villosa	coyote-mint
Monolopia major	cupped monolopia
Navarretia pubescens	downy navarretia
Nicotiana glauca	tree tobacco
Nuttallanthus texana	blue toadflax
Olea europaea	olive
Oxalis pes-caprae	Bermuda buttercup
Panicum capillare	witch grass
Papaver heterophyllum	wind poppy
Pectocarya penicillata	northern pectocarya
Pectocarya pusilla	little pectocarya
Pellaea andromedifolia	coffee fern
Pellaea mucronata	bird's-foot fern
Pentagramma triangularis	gold-back fern
Phacelia breweri	Brewer's phacelia
Phacelia distans~~sp.~~	common phacelia
Phacelia imbricata	imbricate phacelia
Phacelia tanacetifolia	tansy-leaf phacelia
Phalaris paradoxa	hood canarygrass
Phoenix canariensis	Canary Island palm
Pholistoma membranaceum	white fiesta flower
Phoradendron leucarpum subsp. *macrophyllum*	big-leaf mistletoe
Phragmites australis	common reed
Plagiobothrys acanthocarpus	adobe popcornflower
Plagiobothrys bracteatus	bracted popcornflower
Plagiobothrys canescens	valley popcornflower
Plagiobothrys fulvus var. *campestris*	field popcornflower
Plagiobothrys leptocladus	alkali popcornflower
Plagiobothrys stipitatus	stipitate popcornflower
Plagiobothrys tenellus	Pacific popcornflower
Plagiobothrys trachycarpus	rough-nutlet popcornflower
Plantago erecta	California plantain
Plectritis ciliosa	long-spurred plectritis
Plectritis macrocera	long-horn plectritis
Poa annua	annual bluegrass
Poa bulbosa	bulbous bluegrass
Poa secunda subsp. *secunda*	pine bluegrass
Polygonum aviculare	common knotweed
Polypogon monspeliensis	annual rabbit's-foot grass

Scientific Name	Common Name
Populus fremontii	Fremont cottonwood
Proboscidea louisianica subsp. *louisianica*	common devil's-claw
Prunus sp.	peach/plum
Psilocarphus tenellus	slender woolly-marbles
Pterostegia drymarioides	woodland threadstem
Puccinellia simplex	California alkali grass
Quercus douglasii	blue oak
Ranunculus hebecarpus	delicate buttercup
Raphanus sativus	wild radish
Robinia pseudoacacia	black locust
Rumex californicus	Californica dock
Rumex crispus	curly dock
Salix laevigata	red willow
Salsola australis	Russian thistle
Salvia mellifera	black sage
Sambucus nigra	blue elderberry
Sanicula bipinnata	poison sanicle
Sanicula bipinnatifida	purple sanicle
Schinus molle	pepper tree
Schismus arabicus	Mediterranean grass
Schoenoplectus americanus	Olney's three-square bulrush
Schoenoplectus pungens var. *longispicatus*	common three-square bulrush
Schoenoplectus robustus	alkali bulrush
Scrophularia californica	California beeplant
Scutellaria tuberosa	Danny's skullcap
Senecio vulgaris	common groundsel
Silene antirrhina	snapdragon catchfly
Silene gallica	common catchfly
Silybum marianum	milk thistle
Sisymbrium irio	London rocket
Sisymbrium orientale	oriental mustard
Solanum *nigrum*~~sp.~~	black nightshade
Solanum umbelliferum	blue witch nightshade
Sonchus asper	prickly sow-thistle
Sorghum halepense	Johnson grass
Spergularia bocconii	Boccone's sand-spurry
Spergularia marina	saltmarsh sand-spurry
Stebbinsoseris heterocarpa	Santa Cruz microseris
Stellaria media	common chickweed
Stellaria nitens	shining chickweed

Scientific Name	Common Name
Stellaria pallida	lesser chickweed
Stephanomeria virgata subsp. *pleurocarpa*	wand wirelettuce
Stipa cernua	nodding needlegrass
Stipa miliacea	smilo grass
~~*Stipa pulchra*~~	~~purple needlegrass~~
Tamarix ramosissima	saltcedar
~~*Tetrapteron graciliflorum*~~	~~hill suncup~~
Thysanocarpus curvipes var. *curvipes*	lacepod
Torilis arvensis	field hedge parsely
Torilis nodosa	knotted hedge parsely
Toxicodendron diversilobum	poison-oak
Tribulus terrestris	puncture-vine
Trichostema lanceolatum	vinegar curls
Trifolium albopurpureum	Rancheria clover
Trifolium ciliolatum	foothill clover
Trifolium depauperatum var. truncatum	dwarf sack clover
Trifolium gracilentum	pinpoint clover
Trifolium microcephalum	small-headed clover
Trifolium oliganthum	few-flowered clover
Trifolium variegatum	white-tipped clover
Trifolium willdenovii	tomcat clover
Triteleia laxa	Ithuriel's spear
Typha domingensis	southern cattail
Tropidocarpum gracile	daggerpod
Uropappus lindleyi	silverpuffs
Urtica dioica subsp. *holosericea*	hoary nettle
Urtica urens	dwarf nettle
Verbascum thapsus	woolly mullein
Verbena bracteata	bracted vervain
Verbena lasiostachys	western vervain
Veronica anagallis-aquatica	water speedwell
Veronica peregrina	purslane speedwell
Vicia villosa subsp. *varia*	winter vetch
Washingtonia sp.	fan palm
Xanthium strumarium	common cocklebur
Yabea microcarpra	California hedge-parsely
Zeltnera muehlenbergii	Monterey centaury

Table 3. Plant Species Recorded in the Study Area but not Observed During the Botanical Surveys[1]

Scientific Name	**Common Name**
Allophyllum gilioides subsp. *gilioides*	Dense false gilia
Amsinckia tessellata var. gloriosa	Carrizo fiddleneck
Ancistrocarphus filagineus	woolly fishhooks
Androsace elongata subsp. *acuta*	California rockjasmine
Astragalus didymocarpus	two-seeded milkvetch
Athysanus pusillus	petty athysanus
Athysanus unilateralis	ladies-tongue mustard
Calochortus clavatus	club-haired mariposa lily
Caulanthus flavescens	yellow California mustard
Caulanthus lemmonii	Lemmon's jewelflower
Claytonia exigua subsp. *exigua*	little springbeauty
Leptosyne calliopsidea	leafy-stemmed coreopsis
Cryptantha decipiens	gravel cryptantha
Cryptantha nemaclada	Colusa cryptantha
Delphinium gypsophilum	gypsum-loving larkspur
Eastwoodia elegans	yellow mock aster
Eleocharis macrostachya	creeping spikerush
Erysimum capitatum	western wallflower
Eschscholzia rhombipetala	diamond-petaled California poppy
Gilia capitata subsp. *staminea*	bluehead gilia
Gilia minor	little gilia
Grindelia hirsutula	Great Valley gumplant
Hesperolinon californicum	California dwarf flax
Layia platyglossa	tidy-tips
Leptosiphon ambiguus	serpentine leptosiphon
Lessingia pectinata var. *tenuipes*	sticky lessingia
Linanthus dichotomus subsp. *dichotomus*	evening snow
Lithophragma affine	common woodland star
Lithophragma cymbalaria	mission woodland star
Malacothrix coulteri	snake’s-head
Micranthes californica	California saxifrage
Microseris campestris	San Joaquin silverpuffs
Microseris elegans	elegant silverpuffs
Microseris sylvatica	sylvan scorzonella
Monolopia lanceolata	common hillside daisy
Mucronea perfoliata	perfoliate spineflower
Phacelia breweri	Brewer's phacelia

[1] Source: Consortium of California Herbaria

Scientific Name	**Common Name**
Plantago ovata	wooly plantain
Rigiopappus leptocladus	wireweed
Salvia columbariae	chia
Tetrapteron graciliflorum	hill suncup
Trifolium oliganthum	few-flowered clover

Table ~~3~~ 4. Special-status plants occurring near the Del Puerto Canyon Reservoir Project.

Name	Status * Federal/State/ CNPS	Distribution	Habitat	Occurrence in Project Area
Santa Clara thorn mint *Acanthomintha lanceolata*	–/–/4.2	San Francisco Bay Area, Interior South Coast Ranges	Woodland, chaparral, on rocky slopes, outcrops, talus, below 3,940 ft; blooms March–June	~~Potentially Present: not known from project area; nearest occurrences in upper Del Puerto Canyon; p~~Potential habitat present in western part of Project Area; not observed during botanical surveys, presumed absent
Red-flowered bird's-foot trefoil *Acmispon rubriflorus*	–/–/1B.1	Interior North Coast Ranges (Colusa, Tehama Counties), Interior South Coast Ranges (Stanislaus County)	Open, grassy areas in oak woodland, 640–1,605 ft; blooms Apr–May	~~Potentially Present: not known from project area; nearest occurrences 4-9 miles west; p~~Potential habitat present in western part of Project Area; not observed during botanical surveys, presumed absent
Sharsmith's onion *Allium sharsmithiae*	–/–/1B.3	Mount Hamilton Range	Rocky serpentine slopes, in chaparral or cypress woodland, at 400–1200 m; blooms March–May	~~Not Present: not known from project area; nearest occurrences 8-13 miles west; p~~Potential habitat not present in Project Area; not observed during botanical surveys, presumed absent
Large-flowered fiddleneck *Amsinckia grandiflora*	E/E/1B.1	Historically known from Mount Diablo foothills in Contra Costa, Alameda, and San Joaquin	Valley grassland slopes below 1,200 feet; blooms April–May	~~Potentially Present: not known from project area; nearest occurrence 15 miles northwest; p~~Potential habitat present in Project Area; not

Name	Status * Federal/State/ CNPS	Distribution	Habitat	Occurrence in Project Area
		counties; currently known from two natural occurrences		observed during botanical surveys, presumed absent
California androsace *Androsace elongata* subsp. *acuta*	–/–/4.2	Scattered locations throughout California, but primarily in east San Francisco Bay, interior South Coast Ranges, San Joaquin Valley, and southwest California	Moss-covered rock outcrops and open areas in adjacent grassland, at 490–4,280 ft; blooms March–June	~~Potentially Present: reported from Project Area; p~~Potential habitat present in Project Area; not observed during botanical surveys, presumed absent
Carlotta Hall's lace fern *Aspidotis carlotta-halliae*	–/–/4.2	Central Western California	In crevices of serpentine outcrops, at 328–4,590 ft	~~Not Present: not known from project area; nearest occurrence 11 miles west; p~~Potential habitat not present in Project Area; not observed during botanical surveys, presumed absent
Big tarplant *Blepharizonia plumosa*	–/–/1B.1	Interior Coast Range foothills from Contra Costa County to Stanislaus County	Annual grassland, on dry hills and plains, between 50–1,500 feet; blooms July–October	45.25 acres of occupied habitat present in Project Area
Santa Cruz Mountains pussypaws *Calyptridium parryi* var. *hesseae*	–/–/1B.1	Mount Hamilton, Santa Cruz Mountains	Openings in chaparral, cypress forest, on bare, sandy soil, at 1,000–5,020 feet; blooms April–July	~~Not Present: not known from project area; nearest occurrence about 18 miles west; p~~Potential habitat not present in Project Area;

Name	Status * Federal/State/ CNPS	Distribution	Habitat	Occurrence in Project Area
				not observed during botanical surveys, presumed absent
Chaparral harebell *Campanula exigua*	–/–/1B.2	San Francisco Bay region; northern inner south Coast Ranges; Alameda, Contra Costa, San Benito, Santa Clara, and Stanislaus Counties	Rocky areas in chaparral, usually on serpentinite, at 985–4,100 feet; blooms May–June	~~Low Potential to Occur: not known from project area; nearest occurrence 8–11 miles west;~~ ~~p~~Potential habitat not present in ~~in western portion of~~ the Project Area; not observed during botanical surveys, presumed absent
Sharsmith's harebell *Campanula sharsmithiae*	–/–/1B.2	Mount Hamilton Range	Rocky areas in chaparral, talus slopes, on serpentinite; blooms April-June	~~Not Present: not known from project area; nearest occurrence 8–11 miles west; p~~Potential habitat not present in Project Area; not observed during botanical surveys, presumed absent
Lemmon's jewelflower *Caulanthus lemmonii*	–/–/1B.2	Southwestern San Joaquin Valley, southeastern San Francisco Bay Area, eastern Outer South Coast Ranges, Inner South Coast Ranges	Grassland, chaparral, scrub, 245–5,200 feet; blooms March–May	~~Potentially Present: c~~Collected historically in Project Area at the mouth of Del Puerto Canyon; potential habitat present in Project Area; not observed during botanical surveys, presumed absent
Mount Hamilton thistle *Cirsium fontinale* var. *campylon*	–/–/1B.2	East San Francisco Bay Area	Serpentine seeps and streams; blooms April–October	~~Not Present: not known from project area; nearest occurrence 8–13 miles west; p~~Potential habitat not present in Project Area; not

Name	Status * Federal/State/ CNPS	Distribution	Habitat	Occurrence in Project Area
				observed during botanical surveys, presumed absent
Brewer's clarkia *Clarkia breweri*	–/–/4.2	Inner south Coast Ranges; southeast San Francisco Bay; Mt Hamilton Range; Alameda, Fresno, Merced, Monterey, San Benito, Santa Clara, and Stanislaus Counties	Chaparral and cismontane woodland, coastal scrub, on talus or dry slopes, often serpentine, below 4,000 feet; blooms April–May	~~Low Potential to Occur: not known from project area; nearest occurrence 8 miles west; p~~Potential habitat present in Project Area; not observed during botanical surveys, presumed absent
Serpentine collomia *Collomia diversifolia*	–/–/4.3	Inner and High North Coast Ranges, northeastern San Francisco Bay Area	Open, rocky to gravelly areas in serpentine chaparral, at 200–2,950 feet; blooms April–July	~~Not Present: not known from project area; nearest occurrence 8 miles west; p~~Potential habitat not present in Project Area; not observed during botanical surveys, presumed absent
Small-flowered morning-glory *Convolvulus simulans*	–/–/4.2	Southern Sierra Nevada Foothills, San Francisco Bay Area, San Joaquin Valley and adjacent southern Interior Coast Ranges, southern Outer South Coast Ranges, Western Transverse Ranges, South Coast, Channel	Chaparral openings, coastal scrub, valley and foothill grassland, on clay soils in serpentinite seeps, at 100–2,870 feet; blooms April–June	~~Potentially Present: not known from Project Area; nearest occurrence less than 5 miles northwest; p~~Potential habitat present in Project Area; not observed during botanical surveys, presumed absent

Name	Status * Federal/State/ CNPS	Distribution	Habitat	Occurrence in Project Area
		Islands, Peninsular Ranges; Baja California		
Rattan's cryptantha *Cryptantha rattanii*	–/–/4.3	Northern South Coast Ranges	Rocky, gravelly slopes, in grassland, coastal scrub, chaparral, foothill woodland, at 490–2,560 feet; blooms April–July	~~Possibly Present: reported from Del Puerto Canyon; p~~Potential habitat present in Project Area; not observed during botanical surveys, presumed absent
Hospital Canyon larkspur *Delphinium californicum* var. *interius*	–/–/1B.2	Eastern San Francisco Bay Area, northern South Coast Range; Carmel Valley	Moist ravines and slopes in woodlands, 985–3,280 feet; blooms March–May	~~Low Potential to Occur: not known from Project Area; nearest occurrences 8–13 miles west; p~~Potential habitat present in Project Area; not observed during botanical surveys, presumed absent
Tracy's eriastrum *Eriastrum tracyi*	–/–/3.2	Inner North Coast Ranges, disjunct to Mount Hamilton	Grassland, open areas in chaparral or oak woodland, on gravelly shale or clay, at 1,030–7,880 ft; blooms June–July	~~Not Present: not known from Project Area; nearest occurrences 6–7 miles west; p~~Potential habitat not present in ~~western portion of~~ the Project Area; not observed during botanical surveys, presumed absent
Delta button-celery *Eryngium racemosum*	–/E/1B.1	San Joaquin River delta and floodplains	Seasonally-inundated depressions along floodplains; blooms June–October	~~Not Present: not known from Project Area; nearest occurrences 5–9 miles east; p~~Potential habitat not present in Project Area; not observed during botanical surveys, presumed absent

Name	Status * Federal/State/ CNPS	Distribution	Habitat	Occurrence in Project Area
Spiny-sepaled button-celery *Eryngium spinosepalum*	–/–/1B.2	Western San Joaquin Valley, southern Sierra Nevada Foothills	Vernal pools, swales, roadside ditches, at 325–2,625 feet; blooms April–July	~~Not Present: not known from Project Area; nearest occurrence 3 miles south; p~~Potential habitat present in Project Area; not observed during botanical surveys, presumed absent
San Benito poppy *Eschscholzia hypecoides*	–/–/4.3	Inner South Coast Ranges	Chaparral, cismontane woodland, valley and foothill grassland on clay substrates, at 655–5,250 feet; blooms March–June	~~Potentially Present: r~~Reported from multiple locations in Project Area; potential habitat present; observed during botanical surveys
Diamond-petaled California poppy *Eschscholzia rhombipetala*	–/–/1B.1	Interior foothills of South Coast Ranges from Contra Costa County to Stanislaus County; Carrizo Plain in San Luis Obispo County; historically in Inner North Coast Ranges	Grassland, chenopod scrub; on clay soils, where grass cover is sparse enough to allow growth of low annuals, below 3,200 ft; blooms March–May	~~Potentially present: c~~Collected historically in Project Area at the mouth of Del Puerto Canyon; potential habitat present in Project Area; not observed during botanical surveys, presumed absent
Talus fritillary *Fritillaria falcata*	–/–/1B.2	San Francisco Bay Area, Interior South Coast Ranges	Chaparral, oak woodland, coniferous forest, on serpentine talus, at 1,394–4,706 feet; blooms March–May	~~Not Present: not known from Project Area; nearest occurrences 5–13 miles west; p~~Potential habitat not present in Project Area; not observed during botanical surveys, presumed absent

Name	Status * Federal/State/ CNPS	Distribution	Habitat	Occurrence in Project Area
Serpentine bedstraw *Galium andrewsii* subsp. *gatense*	–/–/4.2	San Francisco bay Area, interior South Coast Ranges	Serpentine chaparral, woodlands, in open rocky places, at 720–4,755 feet; blooms April–June	~~Not Present: not known from Project Area; nearest occurrence 7 miles northwest; p~~Potential habitat not present in Project Area; not observed during botanical surveys, presumed absent
Serpentine linanthus *Leptosiphon ambiguus*	–/–/4.2	San Francisco Bay Area, Interior South Coast Ranges, San Joaquin Valley	Serpentine grassland, below 3,280 feet; blooms April–May	~~Not Present: reported from Del Puerto Canyon near Project Area; p~~Potential habitat not present in Project Area; not observed during botanical surveys, presumed absent
Mount Hamilton coreopsis *Leptosyne hamiltonii*	–/–/1B.2	Diablo Range	Openings in chaparral and oak-pine woodland, on step shale talus slopes, at 1,970–4,265 feet; blooms March–May	~~Not Present: not known from Project Area; p~~Potential habitat not present in Project Area; not observed during botanical surveys, presumed absent
Mount Hamilton lomatium *Lomatium observatorium*	–/–/1B.2	Endemic to Mount Hamilton	Oak woodland, between 4,000–4,362 feet; blooms March–May	~~Not Present: not known from Project Area; p~~Potential habitat not present in Project Area; not observed during botanical surveys, presumed absent
Showy madia *Madia radiata*	–/–/1B.1	Scattered populations in the interior foothills of the South Coast Ranges	Oak woodland, grassland; slopes below 3,000 feet; blooms March–May	~~Potentially Present; not reported from project Area; nearest occurrences 10–18 miles to northwest; p~~Potential habitat

Name	Status * Federal/State/ CNPS	Distribution	Habitat	Occurrence in Project Area
				present in Project Area; not observed during botanical surveys, presumed absent
Hall's bush mallow *Malacothamnus hallii*	–/–/1B.2	Contra Costa, Santa Clara, and Merced counties	Chaparral, coastal scrub, between 800–1,350 feet; blooms May–September	~~Potentially Present; not reported from project Area; nearest occurrences 6–9 miles to northwest; p~~Potential habitat present in western part of Project Area; not observed during botanical surveys, presumed absent
Shining navarretia *Navarretia nigelliformis* subsp. *radians*	–/–/1B.2	Interior foothills of South Coast Ranges from Merced County to San Luis Obispo County	Mesic areas with heavy clay soils, in swales and clay flats; in oak woodland, grassland; between 650–3,300 feet; blooms May–June	~~Potentially Present: not known from Project Area; nearest occurrence 3 miles south; p~~Potential habitat present in Project Area; not observed during botanical surveys, presumed absent
San Benito pentachaeta *Pentachaeta exilis* subsp. *aeolica*	–/–/1B.2	San Francisco Bay Area, South Coast Ranges	Grasslands, grassy openings in oak woodlands, at 1,200–2,800 feet; blooms March–May	~~Potentially Present: not known from Project Area; nearest occurrences 13–15 miles southwest; p~~Potential habitat not present in ~~western part of~~ Project Area; not observed during botanical surveys, presumed absent
Mount Diablo phacelia *Phacelia phacelioides*	–/–/1B.2	South Coast Ranges from Contra Costa	Chaparral, oak woodland, adjacent to trails, on rock outcrops and talus slopes,	~~Not Present: not known from Project Area; nearest occurrences 7–10 miles west; p~~Potential habitat not present in Project Area; not

Name	Status * Federal/State/ CNPS	Distribution	Habitat	Occurrence in Project Area
		County to San Benito County	between 2,000–3,800 feet; blooms April–May	observed during botanical surveys, presumed absent
Forget-me-not popcornflower *Plagiobothrys verrucosus*	–/–/2B.1	Southeastern San Francisco Bay Area	Open areas in chaparral, on gravelly soils, common after burns, at ~~700–850 m~~2,200–2,510 feet; blooms March–May	~~Potentially Present: not known from Project Area; nearest occurrence 10 miles west; p~~Potential habitat not present in ~~western part of~~ Project Area; not observed during botanical surveys, presumed absent
California alkali grass *Puccinellia simplex*	–/–/1B.2	Scattered locations in the San Francisco Bay Area, Great Valley, Tehachapi Mountains, western Mojave Desert	Seasonally wet alkaline wetlands, sinks, flats, vernal pools, and lake margins, below 3,000 feet; blooms March–May	Present in Project Area; observed during botanical surveys
Mount Hamilton jewelflower *Streptanthus callistus*	–/–/1B.3	Endemic to Mount Hamilton	Chaparral, oak woodland, at 1,970-2,590 feet; blooms May-July	~~Not Present: not known from Project Area; nearest occurrence 16 miles southwest; p~~Potential habitat not present in Project Area; not observed during botanical surveys, presumed absent

* Status explanations:

Federal
– = No status
E = Listed as “endangered” under the federal Endangered Species Act.

State
– = No status
E = Listed as “endangered” under the California Endangered Species Act.

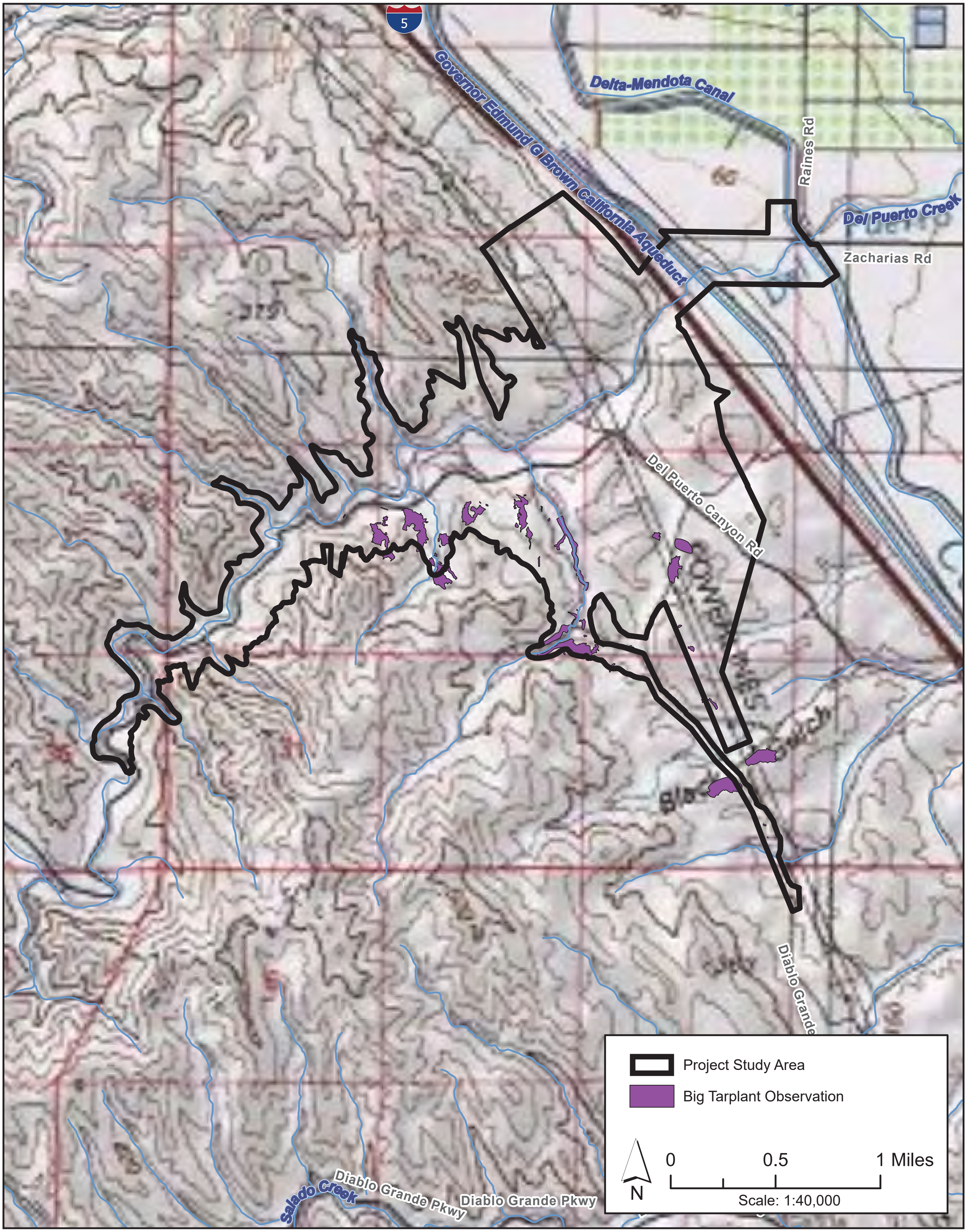
California Rare Plant Rank
1B = Rare, threatened, or endangered in California and elsewhere.
2B = Rare, threatened, or endangered in California, but more common elsewhere.

3	=	Plants about which we need more information.
4	=	Plants of limited distribution.

.1	=	Seriously endangered in California
.2	=	Fairly endangered in California
.3	=	Not very endangered in California

Table 4 5. Big Tarplant at the Del Puerto Canyon Reservoir Project.

Map Polygon	Area (acres)	Plants	Acres in Study Area		Map Polygon	Area (acres)	Plants	Acres in Study Area
1	5.81	3,358	5.81		31	0.00	5	0.00
2	6.52	3,768	6.08		32	0.00	1	0.00
3	0.09	50	0.09		33	0.00	8	0.00
4	0.23	100	0.15		34	0.04	100	0.04
5	0.09	32	0.00		35	0.18	101	0.7
6	5.92	3,423	0.41		36	4.10	2,373	0.99
7	0.05	16	0.05		37	0.40	231	0.40
8	0.00	2	0.00		38	7.11	4111	6.83
9	0.00	1	0.00		39	0.38	222	0.38
10	0.00	1	0.00		40	0.00	10	0.00
11	0.16	100	0.00		41	0.00	6	0.00
12	0.06	25	0.06		42	0.04	21	0.04
13	2.72	1,571	2.69		43	4.38	2,533	3.48
14	0.43	250	0.43		44	0.05	27	0.05
15	0.01	7	0.01		45	0.04	15	0.04
16	0.16	91	0.16		46	0.09	30	0.09
17	0.00	3	0.00		47	0.27	154	0.27
18	0.74	429	0.74		48	0.00	1	0.00
19	3.50	2,022	3.50		49	0.00	1	0.00
20	0.14	79	0.14		50	0.76	438	0.55
21	0.02	100	0.02		51	4.73	2,737	0.00
22	0.05	27	0.05		52	3.16	1,826	3.16
23	0.06	34	0.06		53	2.48	1,433	2.48
24	0.43	249	0.43		54	0.59	388	0.59
25	0.04	25	0.04		**Totals**	**60.90**	**35,309**	**45.25**
26	0.01	10	0.01					
27	3.48	2,014	3.48					
28	1.28	743	1.28					
29	0.02	10	0.02					
30	0.08	48	0.08					



Path: \\PDCCITRDSGIS1\Projects_1\Woodard_Curran\00268_19\Figures\AdminDraft_EIR\Fig_3_X_X_BigTarplant_20191112.aprx Date Saved: 11/15/2019 7:47 PM User: 19393

Figure 1
Big Tarplant Survey Results

Table ~~5~~ 6: Invasive Species Occurring Near the Del Puerto Canyon Reservoir Study Area

Scientific name	Common name	CalIPC Rating *
Avena fatua	wild oats	Moderate
Bassia hyssopifolia	five-horned smotherweed	Limited
Bromus diandrus	ripgut brome	Moderate
Bromus hordeaceus	soft chess	Limited
Bromus madritensis subsp. *rubens*	red brome	High
Carduus pycnocephalus	Italian thistle	Moderate
Centaurea melitensis	tocalote	Moderate
Centaurea solstitialis	yellow star-thistle	High
Cirsium vulgare	bull thistle	Moderate
Cynodon dactylon	Bermuda grass	Moderate
Dittrichia graveolens	stinkweed	Moderate
Eucalyptus globulus	blue gum	Limited
Festuca myuros	foxtail fescue	Moderate
Festuca perennis	Italian ryegrass	Moderate
Ficus carica	common fig	Moderate
Hirschfeldia incana	Mediterranean mustard	Moderate
Hordeum marinum subsp. *gussoneanum*	Mediterranean barley	Moderate
Hordeum murinum subsp. *leporinum*	foxtail barley	Moderate
Lepidium latifolium	perennial peppercress	High
Marrubium vulgare	horehound	Low
Nicotiana glauca	tree tobacco	Moderate
Polypogon monspeliensis	annual rabbit's-foot grass	Limited
Robinia pseudoacacia	black locust	Limited
Rumex crispus	curly dock	Limited
Salsola tragus	Russian thistle	Limited
Schinus molle	pepper tree	Limited
Stipa miliacea	smilo grass	Limited
Tamarix ramosissima	saltcedar	High
Tribulus terrestris	puncture-vine	Limited
Verbascum thapsus	woolly mullein	Limited

* Rating

High:	Has severe ecological impacts on physical processes, plant and animal communities, and vegetation structure
Moderate:	Has substantial and apparent-but generally not severe-ecological impacts on physical processes, plant and animal communities, and vegetation structure
Low:	Invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score

California Native Species Survey Form

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: (916) 324-0475 email: CNDDB@wildlife.ca.gov

For Office Use Only

Source Code: ________ Quad Code: ________

Elm Code: ________ Occ No.: ________

EO Index: ________ Map Index: ________

Date of Field Work (mm/dd/yyyy): 10/30/2019

Clear Form

California Native Species Field Survey Form

Print Form

Scientific Name: Blepharizonia plumosa

Common Name: Big tarplant

Species Found? (●) Yes ( ) No ________ If not found, why?

Total No. Individuals: 35,000 Subsequent Visit? (●) Yes ( ) No

Is this an existing NDDB occurrence? 50 (Yes, Occ. #) ☐ No ☐ Unk.

Collection? If yes: ________ Number ________ Museum / Herbarium

Reporter: Robert E. Preston

Address: ICF, 630 K Street, Suite 400
Sacramento, CA 95814

E-mail Address: robert.preston@icf.com

Phone: 530-786-5918

Plant Information

Phenology:

% vegetative	% flowering	% fruiting
	100	100

Animal Information

________ # adults ________ # juveniles ________ # larvae ________ # egg masses ________ # unknown

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ lek ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

Along lower slopes of canyons, south of Del Puerto Canyon Road, ca. 1 mi west of I-5

County: Stanislaus Landowner / Mgr: private

Quad Name: Patterson Elevation: 320-660 ft

T 5S R 7E Sec 28 , ____1/4 of ____ 1/4, Meridian: H ( ) M (●) S ( ) Source of Coordinates (GPS, topo. map & type): gps

T 5S R 7E Sec 29 , ____1/4 of ____ 1/4, Meridian: H ( ) M (●) S ( ) GPS Make & Model: Garmin GPSMap 60CSx

DATUM: **NAD27** ( ) **NAD83** ( ) **WGS84** (●) Horizontal Accuracy: 15 ft meters/feet

Coordinate System: UTM Zone 10 ( ) UTM Zone 11 ( ) ***OR*** Geographic (Latitude & Longitude) (●)

Coordinates: 37.46714 N, -121.21371 W (approximate centroid of mapped polygons)

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Grasslands, along lower slopes, with Holocarpha heermannii, Lagophylla ramosissima, Croton setiger, Trichostema lanceolatum, Blepharizonia laxa

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): (●) Excellent ( ) Good ( ) Fair ( ) Poor

Immediate AND surrounding land use: open rangeland

Visible disturbances: recent grassland wildfire, cattle grazing, electric transmission lines, gas line, dirt access roads

Threats: proposed reservoir project

Comments: 54 polygons mapped, all part of a single metapopulation; includes EO 37, 50, and 51; see attached kmz file and spreadsheet

Determination: *(check one or more, and fill in blanks)*
- ☐ Keyed (cite reference): ________
- ☐ Compared with specimen housed at: ________
- ☐ Compared with photo / drawing in: ________
- ☐ By another person (name): ________
- ☒ Other: personal familiarity

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? ( ) yes ( ) no

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: (916) 324-0475 email: CNDDB@wildlife.ca.gov

Date of Field Work (mm/dd/yyyy): 06/19/2019

For Office Use Only
Source Code: ______ Quad Code: ______
Elm Code: ______ Occ No.: ______
EO Index: ______ Map Index: ______

Clear Form

California Native Species Field Survey Form

Print Form

Scientific Name: Puccinellia simplex

Common Name: California alkali grass

Species Found? (●) Yes ( ) No ______ If not found, why?

Total No. Individuals: 100-200 Subsequent Visit? ( ) Yes (●) No

Is this an existing NDDB occurrence? ______ Yes, Occ. # ☐ No ☐ Unk.

Collection? If yes: ______ Number ______ Museum / Herbarium

Reporter: Robert E. Preston
Address: ICF, 630 K Street, Suite 400
Sacramento, CA 95814
E-mail Address: robert.preston@icf.com
Phone: 530-786-5918

Plant Information
Phenology:
______ % vegetative ______ % flowering 100 % fruiting

Animal Information
______ # adults ______ # juveniles ______ # larvae ______ # egg masses ______ # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ lek ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)
Along Del Puerto Canyon Road, 4.47 miles west of its jct with Diablo Grande Parkway, at base of seep between the road and Del Puerto Creek

County: Stanislaus Landowner / Mgr: private
Quad Name: Patterson Elevation: 400 ft
T 5S R 7E Sec 30, SE 1/4 of SW 1/4, Meridian: H ( ) M (●) S ( ) Source of Coordinates (GPS, topo. map & type): gps
T ____ R ____ Sec ____, ____ 1/4 of ____ 1/4, Meridian: H ( ) M ( ) S ( ) GPS Make & Model: Garmin GPSMap 60CSx
DATUM: NAD27 ( ) NAD83 ( ) WGS84 (●) Horizontal Accuracy: ______ meters/feet
Coordinate System: UTM Zone 10 ( ) UTM Zone 11 ( ) ***OR*** Geographic (Latitude & Longitude) (●)
Coordinates: 37.2456 N, -121.2456 E

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Barren area downslope from alkaline/saline seep, with Distichlis spicata, Spergularia marina, Centromadia pungens, Atriplex sp.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ( ) Excellent ( ) Good (●) Fair ( ) Poor
Immediate AND surrounding land use: open rangeland
Visible disturbances: none noted
Threats: proposed reservoir
Comments: Occupied habitat is 1,150 square feet

Determination: *(check one or more, and fill in blanks)*
☐ Keyed (cite reference): ______
☐ Compared with specimen housed at: ______
☐ Compared with photo / drawing in: ______
☐ By another person (name): ______
☒ Other: personal familiarity

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? ( ) yes ( ) no

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
P.O. Box 944209
Sacramento, CA 94244-2090
CNDDB@wildlife.ca.gov

For Office Use Only

Source Code: ______ Quad Code: ______
Elm Code: ______ Occ No.: ______
EO Index: ______ Map Index: ______

Date of Field Work (mm/dd/yyyy): 03/30/2020

Clear Form | Print Form

California Native Species Field Survey Form

Scientific Name: Eschscholzia hypecoides

Common Name: San Benito poppy

Species Found? ◉ Yes ○ No ______ If not found, why?

Total No. Individuals: 39 Subsequent Visit? ○ Yes ○ No

Is this an existing NDDB occurrence? ______ Yes, Occ. # ☒ No ☐ Unk.

Collection? If yes: ______ Number ______ Museum / Herbarium

Reporter: Devin Jokerst

Address: 980 9th Street, Suite 1200, Sacramento, CA 95814

E-mail Address: devin.jokerst@icf.com

Phone: ______

Plant Information

Phenology: ______ % vegetative 85 % flowering 15 % fruiting

Animal Information

______ # adults ______ # juveniles ______ # larvae ______ # egg masses ______ # unknown

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ lek ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

In Del Puerto Canyon, north of Del Puerto Canyon Road, in a southward-draining canyon (dry at time of survey)

County: Stanislaus Landowner / Mgr: Private

Quad Name: Patterson Elevation: 371

T____ R____ Sec____, ____1/4 of ____ 1/4, Meridian: H○ M○ S○ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec____, ____1/4 of ____ 1/4, Meridian: H○ M○ S○ GPS Make & Model: Ipad

DATUM: NAD27 ○ NAD83 ○ WGS84 ◉ Horizontal Accuracy: 30 ft meters/feet

Coordinate System: UTM Zone 10 ○ UTM Zone 11 ○ ***OR*** Geographic (Latitude & Longitude) ◉

Coordinates: 37.482672°, -121.225287°

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ○ Excellent ◉ Good ○ Fair ○ Poor

Immediate AND surrounding land use: Cattle grazing

Visible disturbances: non-native annual grasses

Threats: development

Comments: In southward-draining canyon, E. hypecoides observed on southeast-facing slope (approx 50° angle) composed of a loose,rocky soil substrate. At the occurrence, 45% vegetation cover was dominated by Eriogonum nudum with sparse coverage of Bromus rubens and Avena barbata.

Determination: *(check one or more, and fill in blanks)*

- ☒ Keyed (cite reference): Jepson eFlora 2020
- ☐ Compared with specimen housed at: ______
- ☐ Compared with photo / drawing in: ______
- ☒ By another person (name): Dr. Robert Preston
- ☐ Other: ______

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☒
Habitat	☐	☐	☒
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? ◉ yes ○ no

APPENDIX B4: Special-Status Species Tables

Table B4-1. Special-Status Plants Occurring Near the Del Puerto Canyon Reservoir Project

Name	Status * Federal/State/ CNPS	Distribution	Habitat	Occurrence in Project Area
Santa Clara thorn mint *Acanthomintha lanceolata*	–/–/4.2	San Francisco Bay Area, Interior South Coast Ranges	Woodland, chaparral, on rocky slopes, outcrops, talus, below 3,940 ft; blooms March–June	~~Potentially Present: not known from project area; nearest occurrences in upper Del Puerto Canyon; p~~Potential habitat present in western part of Project Area; not observed during botanical surveys, presumed absent
Red-flowered bird's-foot trefoil *Acmispon rubriflorus*	–/–/1B.1	Interior North Coast Ranges (Colusa, Tehama Counties), Interior South Coast Ranges (Stanislaus County)	Open, grassy areas in oak woodland, 640–1,605 ft; blooms Apr–May	~~Potentially Present: not known from project area; nearest occurrences 4-9 miles west; p~~Potential habitat present in western part of Project Area; not observed during botanical surveys, presumed absent
Sharsmith's onion *Allium sharsmithiae*	–/–/1B.3	Mount Hamilton Range	Rocky serpentine slopes, in chaparral or cypress woodland, at 400–1200 m; blooms March–May	~~Not Present: not known from project area; nearest occurrences 8-13 miles west; p~~Potential habitat not present in Project Area; not observed during botanical surveys, presumed absent
Large-flowered fiddleneck *Amsinckia grandiflora*	E/E/1B.1	Historically known from Mount Diablo foothills in Contra Costa, Alameda, and San Joaquin counties; currently known from two natural occurrences	Valley grassland slopes below 1,200 feet; blooms April–May	~~Potentially Present: not known from project area; nearest occurrence 15 miles northwest; p~~Potential habitat present in Project Area; not observed during botanical surveys, presumed absent

Name	Status * Federal/State/ CNPS	Distribution	Habitat	Occurrence in Project Area
California androsace *Androsace elongata* subsp. *acuta*	–/–/4.2	Scattered locations throughout California, but primarily in east San Francisco Bay, interior South Coast Ranges, San Joaquin Valley, and southwest California	Moss-covered rock outcrops and open areas in adjacent grassland, at 490–4,280 ft; blooms March–June	~~Potentially Present: reported from Project Area; p~~Potential habitat present in Project Area; not observed during botanical surveys, presumed absent
Carlotta Hall's lace fern *Aspidotis carlotta-halliae*	–/–/4.2	Central Western California	In crevices of serpentine outcrops, at 328–4,590 ft	~~Not Present: not known from project area; nearest occurrence 11 miles west; p~~Potential habitat not present in Project Area; not observed during botanical surveys, presumed absent
Big tarplant *Blepharizonia plumosa*	–/–/1B.1	Interior Coast Range foothills from Contra Costa County to Stanislaus County	Annual grassland, on dry hills and plains, between 50–1,500 feet; blooms July–October	45.25 acres of occupied habitat present in Project Area
Santa Cruz Mountains pussypaws *Calyptridium parryi* var. *hesseae*	–/–/1B.1	Mount Hamilton, Santa Cruz Mountains	Openings in chaparral, cypress forest, on bare, sandy soil, at 1,000–5,020 feet; blooms April–July	~~Not Present: not known from project area; nearest occurrence about 18 miles west; p~~Potential habitat not present in Project Area; not observed during botanical surveys, presumed absent
Chaparral harebell *Campanula exigua*	–/–/1B.2	San Francisco Bay region; northern inner south Coast Ranges; Alameda, Contra Costa, San Benito, Santa Clara, and Stanislaus Counties	Rocky areas in chaparral, usually on serpentinite, at 985–4,100 feet; blooms May–June	~~Low Potential to Occur: not known from project area; nearest occurrence 8–11 miles west; p~~Potential habitat not present in ~~in western portion of~~ the Project Area; not observed during botanical surveys, presumed absent

Name	Status * Federal/State/ CNPS	Distribution	Habitat	Occurrence in Project Area
Sharsmith's harebell *Campanula sharsmithiae*	–/–/1B.2	Mount Hamilton Range	Rocky areas in chaparral, talus slopes, on serpentinite; blooms April-June	~~Not Present: not known from project area; nearest occurrence 8–11 miles west; p~~<u>P</u>otential habitat not present in Project Area<u>; not observed during botanical surveys, presumed absent</u>
Lemmon’s jewelflower *Caulanthus lemmonii*	–/–/1B.2	Southwestern San Joaquin Valley, southeastern San Francisco Bay Area, eastern Outer South Coast Ranges, Inner South Coast Ranges	Grassland, chaparral, scrub, 245–5,200 feet; blooms March–May	~~Potentially Present: c~~<u>C</u>ollected historically in Project Area at the mouth of Del Puerto Canyon; potential habitat present in Project Area<u>; not observed during botanical surveys, presumed absent</u>
Mount Hamilton thistle *Cirsium fontinale* var. *campylon*	–/–/1B.2	East San Francisco Bay Area	Serpentine seeps and streams; blooms April–October	~~Not Present: not known from project area; nearest occurrence 8–13 miles west; p~~<u>P</u>otential habitat not present in Project Area<u>; not observed during botanical surveys, presumed absent</u>
Brewer's clarkia *Clarkia breweri*	–/–/4.2	Inner south Coast Ranges; southeast San Francisco Bay; Mt Hamilton Range; Alameda, Fresno, Merced, Monterey, San Benito, Santa Clara, and Stanislaus Counties	Chaparral and cismontane woodland, coastal scrub, on talus or dry slopes, often serpentine, below 4,000 feet; blooms April–May	~~Low Potential to Occur: not known from project area; nearest occurrence 8 miles west; p~~<u>P</u>otential habitat present in Project Area<u>; not observed during botanical surveys, presumed absent</u>
Serpentine collomia *Collomia diversifolia*	–/–/4.3	Inner and High North Coast Ranges, northeastern San Francisco Bay Area	Open, rocky to gravelly areas in serpentine chaparral, at 200–2,950 feet; blooms April–July	~~Not Present: not known from project area; nearest occurrence 8 miles west; p~~<u>P</u>otential habitat not present in Project Area<u>; not observed during botanical surveys, presumed absent</u>

Name	Status * Federal/State/ CNPS	Distribution	Habitat	Occurrence in Project Area
Small-flowered morning-glory *Convolvulus simulans*	–/–/4.2	Southern Sierra Nevada Foothills, San Francisco Bay Area, San Joaquin Valley and adjacent southern Interior Coast Ranges, southern Outer South Coast Ranges, Western Transverse Ranges, South Coast, Channel Islands, Peninsular Ranges; Baja California	Chaparral openings, coastal scrub, valley and foothill grassland, on clay soils in serpentinite seeps, at 100–2,870 feet; blooms April–June	~~Potentially Present: not known from Project Area; nearest occurrence less than 5 miles northwest; p~~Potential habitat present in Project Area; not observed during botanical surveys, presumed absent
Rattan's cryptantha *Cryptantha rattanii*	–/–/4.3	Northern South Coast Ranges	Rocky, gravelly slopes, in grassland, coastal scrub, chaparral, foothill woodland, at 490–2,560 feet; blooms April–July	~~Possibly Present: reported from Del Puerto Canyon; p~~Potential habitat present in Project Area; not observed during botanical surveys, presumed absent
Hospital Canyon larkspur *Delphinium californicum* var. *interius*	–/–/1B.2	Eastern San Francisco Bay Area, northern South Coast Range; Carmel Valley	Moist ravines and slopes in woodlands, 985–3,280 feet; blooms March–May	~~Low Potential to Occur: not known from Project Area; nearest occurrences 8–13 miles west; p~~Potential habitat present in Project Area; not observed during botanical surveys, presumed absent
Tracy's eriastrum *Eriastrum tracyi*	–/–/3.2	Inner North Coast Ranges, disjunct to Mount Hamilton	Grassland, open areas in chaparral or oak woodland, on gravelly shale or clay, at 1,030–7,880 ft; blooms June–July	~~Not Present: not known from Project Area; nearest occurrences 6–7 miles west; p~~Potential habitat not present in ~~western portion of~~ the Project Area; not observed during botanical surveys, presumed absent
Delta button-celery *Eryngium racemosum*	–/E/1B.1	San Joaquin River delta and floodplains	Seasonally-inundated depressions along floodplains; blooms June–October	~~Not Present: not known from Project Area; nearest occurrences 5–9 miles east; p~~Potential habitat not present in Project Area; not observed during botanical surveys, presumed absent

Name	Status * Federal/State/ CNPS	Distribution	Habitat	Occurrence in Project Area
Spiny-sepaled button-celery *Eryngium spinosepalum*	–/–/1B.2	Western San Joaquin Valley, southern Sierra Nevada Foothills	Vernal pools, swales, roadside ditches, at 325–2,625 feet; blooms April–July	~~Not Present: not known from Project Area; nearest occurrence 3 miles south; p~~Potential habitat present in Project Area; not observed during botanical surveys, presumed absent
San Benito poppy *Eschscholzia hypecoides*	–/–/4.3	Inner South Coast Ranges	Chaparral, cismontane woodland, valley and foothill grassland on clay substrates, at 655–5,250 feet; blooms March–June	~~Potentially Present: r~~Reported from multiple locations in Project Area; potential habitat present; observed during botanical surveys
Diamond-petaled California poppy *Eschscholzia rhombipetala*	–/–/1B.1	Interior foothills of South Coast Ranges from Contra Costa County to Stanislaus County; Carrizo Plain in San Luis Obispo County; historically in Inner North Coast Ranges	Grassland, chenopod scrub; on clay soils, where grass cover is sparse enough to allow growth of low annuals, below 3,200 ft; blooms March–May	~~Potentially present: c~~Collected historically in Project Area at the mouth of Del Puerto Canyon; potential habitat present in Project Area; not observed during botanical surveys, presumed absent
Talus fritillary *Fritillaria falcata*	–/–/1B.2	San Francisco Bay Area, Interior South Coast Ranges	Chaparral, oak woodland, coniferous forest, on serpentine talus, at 1,394–4,706 feet; blooms March–May	~~Not Present: not known from Project Area; nearest occurrences 5–13 miles west; p~~Potential habitat not present in Project Area; not observed during botanical surveys, presumed absent
Serpentine bedstraw *Galium andrewsii* subsp. *gatense*	–/–/4.2	San Francisco bay Area, interior South Coast Ranges	Serpentine chaparral, woodlands, in open rocky places, at 720–4,755 feet; blooms April–June	~~Not Present: not known from Project Area; nearest occurrence 7 miles northwest; p~~Potential habitat not present in Project Area; not observed during botanical surveys, presumed absent

Name	Status * Federal/State/ CNPS	Distribution	Habitat	Occurrence in Project Area
Serpentine linanthus *Leptosiphon ambiguus*	–/–/4.2	San Francisco Bay Area, Interior South Coast Ranges, San Joaquin Valley	Serpentine grassland, below 3,280 feet; blooms April–May	~~Not Present: reported from Del Puerto Canyon near Project Area; p~~Potential habitat not present in Project Area; not observed during botanical surveys, presumed absent
Mount Hamilton coreopsis *Leptosyne hamiltonii*	–/–/1B.2	Diablo Range	Openings in chaparral and oak-pine woodland, on step shale talus slopes, at 1,970–4,265 feet; blooms March–May	~~Not Present: not known from Project Area; p~~Potential habitat not present in Project Area; not observed during botanical surveys, presumed absent
Mount Hamilton lomatium *Lomatium observatorium*	–/–/1B.2	Endemic to Mount Hamilton	Oak woodland, between 4,000–4,362 feet; blooms March–May	~~Not Present: not known from Project Area; p~~Potential habitat not present in Project Area; not observed during botanical surveys, presumed absent
Showy madia *Madia radiata*	–/–/1B.1	Scattered populations in the interior foothills of the South Coast Ranges	Oak woodland, grassland; slopes below 3,000 feet; blooms March–May	~~Potentially Present; not reported from project Area; nearest occurrences 10–18 miles to northwest; p~~Potential habitat present in Project Area; not observed during botanical surveys, presumed absent
Hall's bush mallow *Malacothamnus hallii*	–/–/1B.2	Contra Costa, Santa Clara, and Merced counties	Chaparral, coastal scrub, between 800–1,350 feet; blooms May–September	~~Potentially Present; not reported from project Area; nearest occurrences 6–9 miles to northwest; p~~Potential habitat present in western part of Project Area; not observed during botanical surveys, presumed absent

Name	Status * Federal/State/ CNPS	Distribution	Habitat	Occurrence in Project Area
Shining navarretia *Navarretia nigelliformis* subsp. *radians*	–/–/1B.2	Interior foothills of South Coast Ranges from Merced County to San Luis Obispo County	Mesic areas with heavy clay soils, in swales and clay flats; in oak woodland, grassland; between 650–3,300 feet; blooms May–June	~~Potentially Present: not known from Project Area; nearest occurrence 3 miles south; p~~<u>P</u>otential habitat present in Project Area<u>; not observed during botanical surveys, presumed absent</u>
San Benito pentachaeta *Pentachaeta exilis* subsp. *aeolica*	–/–/1B.2	San Francisco Bay Area, South Coast Ranges	Grasslands, grassy openings in oak woodlands, at 1,200–2,800 feet; blooms March–May	~~Potentially Present: not known from Project Area; nearest occurrences 13–15 miles southwest; p~~<u>P</u>otential habitat <u>not</u> present in ~~western part of~~ Project Area<u>; not observed during botanical surveys, presumed absent</u>
Mount Diablo phacelia *Phacelia phacelioides*	–/–/1B.2	South Coast Ranges from Contra Costa County to San Benito County	Chaparral, oak woodland, adjacent to trails, on rock outcrops and talus slopes, between 2,000–3,800 feet; blooms April–May	~~Not Present: not known from Project Area; nearest occurrences 7–10 miles west; p~~<u>P</u>otential habitat not present in Project Area<u>; not observed during botanical surveys, presumed absent</u>
Forget-me-not popcornflower *Plagiobothrys verrucosus*	–/–/2B.1	Southeastern San Francisco Bay Area	Open areas in chaparral, on gravelly soils, common after burns, at ~~700–850 m~~<u>2,200–2,510 feet</u>; blooms March–May	~~Potentially Present: not known from Project Area; nearest occurrence 10 miles west; p~~<u>P</u>otential habitat <u>not</u> present in ~~western part of~~ Project Area<u>; not observed during botanical surveys, presumed absent</u>
California alkali grass *Puccinellia simplex*	–/–/1B.2	Scattered locations in the San Francisco Bay Area, Great Valley, Tehachapi Mountains, western Mojave Desert	Seasonally wet alkaline wetlands, sinks, flats, vernal pools, and lake margins, below 3,000 feet; blooms March–May	Present in Project Area<u>; observed during botanical surveys</u>

Name	Status * Federal/State/ CNPS	Distribution	Habitat	Occurrence in Project Area
Mount Hamilton jewelflower *Streptanthus callistus*	–/–/1B.3	Endemic to Mount Hamilton	Chaparral, oak woodland, at 1,970-2,590 feet; blooms May-July	~~Not Present: not known from Project Area; nearest occurrence 16 miles southwest; p~~Potential habitat not present in Project Area; not observed during botanical surveys, presumed absent

* Status explanations:

Federal
– = No status
E = Listed as "endangered" under the federal Endangered Species Act.

State
– = No status
E = Listed as "endangered" under the California Endangered Species Act.

California Rare Plant Rank
1B = Rare, threatened, or endangered in California and elsewhere.
2B = Rare, threatened, or endangered in California, but more common elsewhere.
3 = Plants about which we need more information.
4 = Plants of limited distribution.

.1 = Seriously endangered in California
.2 = Fairly endangered in California
.3 = Not very endangered in California

Table B4-2. Special-Status Wildlife with Potential to Occur in the Study Area

Common Name	Scientific Name	Status (Fed/State)	Range and General Habitat Description	Potential for Occurrence
Vernal pool fairy shrimp	*Branchinecta lynchi*	T/–	Occurs in the Central Valley, central and south Coast Ranges from Tehama County to Santa Barbara County. Inhabits vernal pools and also found in sandstone rock outcrop pools.	**Moderate.** Suitable habitat is present in the study area. There are no CNDDB records within 5 miles of the study area. The closest CNDDB record is approximately 6 miles north of the study area (from 1998; occurrence #799).
Vernal pool tadpole shrimp	*Lepidurus packardi*	E/–	Occurs from Shasta County south to Merced County. Inhabits vernal pools and seasonal stock ponds.	**Moderate**. Suitable habitat is present in the study area. There are no CNDDB records within 5 miles of the study area. The closest CNDDB record is approximately 12 miles north of the study area (from 2000; occurrence #338).
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	T/–	Current range extends throughout the Central Valley; range extends from approximately Shasta County to Fresno County including valley floor and lower foothills. Majority of occurrences are below 500 feet in elevation[1]. Elderberry shrubs (*Sambucus* sp.) are the host plant. Elderberry shrubs occur in riparian (valley-foothill forest habitat) and non-riparian (valley oak and blue oak woodland and annual grassland) vegetative communities. USFWS recognizes habitat for VELB as including both riparian and non-riparian areas where elderberry shrubs are present[1].	**High.** Several elderberry shrubs are present along and in the vicinity of Del Puerto Creek in the study area below 500 feet elevation and could provide host plants for the species. An exit hole was observed on one of the shrubs. There are no CNDDB records within 5 miles of the study area. The closest CNDDB record is approximately 8 miles northeast of the study area (from1999; occurrence #181).
Crotch bumble bee	*Bombus crotchii*	–/CE	Historically ranged across southern California, from the coast and coastal ranges, through the Central Valley, and to the adjacent foothills (CDFW 2019)[2]. The species has since substantially declined in the Central Valley and recent records are limited to southern California, the Bay Area, and the Sacramento Valley (CDFW 2019). Found in open grassland and scrub. Construct nests underground an may rely on mammal burrows for use in nesting. Active from late February to	**Low.** There are two historic records for Crotch bumble bee, one approximately 4 miles west of the study area in Del Puerto Canyon, and another 2.75 miles east of the study area near Patterson. There are no recent records in the Central Valley and or adjacent Coast Range foothills. The study area has a low

[1] U.S. Fish and Wildlife Service. 2017. Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle (Desmocerus californicus dimorphus). Sacramento, CA.

[2] California Department of Fish and Wildlife. 2019. Report to the Fish and Game Commission, Evaluation of the petition from the Xerces Society, Defenders of Wildlife, and the Center for Food Safety to list four species of bumble bees as endangered under the California Endangered Species Act. April 4, 2019.

			late October. Forage on a wide variety of plants. Bumble bees require a reliable supply of nectar and pollen source throughout the nesting season (Goulson 2010 in Schweitzer et al. 2012).[3]	density of floral resources, which are mostly limited to the spring season and thus the study area would not likely support sufficient nectar and pollen sources during the remainder of the active season. Also, the study area has been grazed for decades, which has been identified as a practice affecting foraging habitat (CDFW 2019).
Western bumble bee	*Bombus occidentalis occidentalis*	–/CE	Historically ranged from Channel Island to northern extent of the state, primarily in the coastal and Sierra Nevada ranges, mostly excluding the Central Valley and drier, warmer areas. Occurs from southern British Columbia, Canada south to multiple western U.S. states, including California. Data suggest populations are currently restricted to high elevation sites in the Sierra-Cascades and coastal areas, although there are some observations of this species on the northern California coast (California Department of Fish and Wildlife 2019e). Requires floral resources, undisturbed nest sites (e.g. abandoned rodent burrows, underground cavities, log cavities, dead vegetation/leaf litter, abandoned bird nests), and overwintering sites (e.g. friable soil and under plant litter and trees). Nests, forages, and overwinters in meadows and grasslands with abundant floral resources and may be found in some natural areas within urban environments. Requires floral resources throughout the flight period (from early February to late November) (CDFW 2019). Bumble bees require a reliable supply of nectar and pollen source throughout the nesting season (Goulson 2010 in Schweitzer et al. 2012).[2]	**None.** The study area is outside of the current known range and lacks abundant floral resources for foraging.
California red-legged frog	*Rana draytonii*	T/SSC	Found along the coast and coastal mountain ranges of California from Mendocino County to San Diego County and in the Sierra Nevada from Tehama County to Fresno County; elevation near sea level to about 4,900 feet. Inhabits permanent and semi-permanent aquatic habitat, including creeks and ponds with emergent vegetation. Uses upland areas adjacent to aquatic	**Moderate.** Del Puerto Creek and a stock pond within the study area represent suitable aquatic habitat. Suitable upland habitat is present within 300 feet of suitable aquatic habitat and dispersal habitat is present within 1 mile of aquatic habitat. The closest CNDDB records

[3] Schweitzer, D.F., N.A. Capuano, B.E. Young, and S.R. Colla. 2012. *Conservation and management of North American bumble bees.* NatureServe, Arlington, Virginia, and USDA Forest Service, Washington, D.C.

			habitat for cover (small mammal burrows, logs, rocks, leaf litter) and dispersal.	for the species are approximately 15 miles south (occurrence # 61) and 14.75 miles west (occurrence # 1548) of the study area.
California tiger salamander	*Ambystoma californiense*	T/T	Central Valley, including Sierra Nevada foothills, up to approximately 1,000 feet, and coastal region from Butte County south to northeastern San Luis Obispo County. Most populations in the Central Valley have been extirpated and remaining populations are in grasslands on the edge of the valley and in the surrounding foothills. Breeds during the wet season in vernal pools and ponds (that lack predators) in grassland and oak woodlands with a minimum of 10-week inundation. Adults spend most of the year underground in small mammal burrows, rock crevices or under fallen logs in upland grassland and oak savannah habitats.	**Moderate**. Stock ponds in the study area represent suitable aquatic breeding habitat. Grasslands throughout the study area are located within 1.24 mile of potential breeding ponds and contain numerous small mammal burrows and soil cracks that could be used as upland habitat. There are no CNDDB records within 5 miles of the study area. The closest CNDDB record is 8.5 miles northwest from the study area (occurrence # 864).
Foothill yellow-legged frog	*Rana boylii*	–/CT,SSC	In most of northern California west of Cascade crest and along western flank of Sierra south to Kern County. Isolated population in San Joaquin County. Absent from Monterey County and San Gabriel Mountains. Ranges up to approximately 6,000 feet. Inhabits streams in woodland, forest, mixed chaparral, and wet meadow habitats with rock and gravel substrate and low overhanging vegetation along the edge; usually found near riffles with rocks and sunny banks nearby.	**Moderate.** Del Puerto Creek and adjacent riparian habitat represents suitable habitat in the study area. There are 4 CNDDB records within 5 miles of the study area, with the closest record on the southwestern boundary of the study area (from 1954; occurrence #2073).
Western spadefoot toad	*Spea hammondii*	–/SSC	Sierra Nevada foothills, Central Valley, Coast Ranges, coastal counties in southern California; west of Sierran-desert range axis. Inhabits shallow streams with riffles and seasonal wetlands, such as vernal and seasonal pools, in annual grasslands and oak woodlands. Majority of life spent underground.	**Moderate.** Suitable aquatic habitat (seasonal wetlands and stock ponds) and upland habitat (grasslands) is present in the study area. There are 4 CNDDB records within 5 miles of the study area, with the closest record just outside the southwestern boundary of the study area (from 2001; occurrence #281).
Blunt-nosed leopard lizard	*Gambelia sila*	E/E, FP	Found in San Joaquin Valley, Carrizo Plain, and Cuyama Valley in open areas of low relief. Occurs at elevations between 100 and 2,400 feet. Most commonly found in annual grassland and valley sink scrub, where there are small mammal burrows for shelter.	**None.** Grasslands in the study area do not support key characteristics of known occupied habitat. Blunt-nosed leopard Lizards typically inhabit relatively flat and sparsely vegetated

				areas of the San Joaquin Desert[4]. Grassland within the study area is characterized by tall dense grasses within the Del Puerto canyon with most of the areas having greater than 15 percent slopes. The study area overlaps with the extreme northwest corner of the species' range as mapped by USFWS[5]. The closest CNDDB record is 45 miles south of the study area.
Blainville's horned lizard	*Phrynosoma blainvillii*	–/SSC	Occurs in the Sierra Nevada foothills from Butte Co. south to Kern Co. and central and southern California coast. Occurs in central Contra Costa, eastern Alameda, and southwestern San Joaquin counties. Elevational range below 4,000 feet in northern California. Utilizes a variety of habitats, from brush-lands to coniferous forests, including annual grassland. Requires open areas of sandy soils and low vegetation for sunning. Harvester ants are the primary food source.	**Moderate**. Suitable sandy soils are present in the study area. There are no CNDDB records within 5 miles of the study area. The closest CNDDB record is approximately 15.5 miles from the study area.
Northern California legless lizard	*Anniella pulchra*	–/SSC	Occurs along the Coast, Transverse, and Peninsular Ranges from Contra Costa County to San Diego County with spotty occurrences in the San Joaquin Valley. Found in habitats with loose soil for burrowing or thick duff or leaf litter; often forages in leaf litter at plant bases; may be found on beaches, sandy washes, and in woodland, chaparral, and riparian areas.	**Moderate**. Suitable sandy soils are present in the study area. There is 1 CNDDB record within 5 miles of the study area, approximately 5 miles southwest of the study area (from 2000; occurrence #125).
San Joaquin coachwhip	*Masticophis flagellum ruddocki*	–/SSC	From Colusa County in the Sacramento Valley southward to the grapevine in the San Joaquin Valley and westward into the inner Coast Ranges. An isolated population occurs at Sutter Buttes. Known elevation range from approximately 66 to 2,952 feet. Occurs in open, dry, vegetative associations with little or no tree cover (e.g., valley grassland and saltbush scrub associations); often occurs in association with mammal burrows.	**High**. Suitable open grassland and small mammal burrows are present in the study area. There is 1 CNDDB record within 5 miles of the study area, approximately 1 mile east of the study area (from 1998; occurrence #23).

[4] Germano D. J. and G. B. Rathbun. 2016. Home range and habitat use by blunt-nosed leopard lizards in the southern San Joaquin Desert of California. Journal of Herpetology, 50:3 429-434

[5] U.S. Fish and Wildlife Service. 2019. Species profile for blunt-nosed leopard lizard (*Gambelia silus*), Environmental Conservation Online System. Available: https://ecos.fws.gov/ecp0/profile/speciesProfile?sId=625. Accessed: September 5, 2019

Giant garter snake	*Thamnophis gigas*	T/T	Central Valley from the vicinity of Burrel in Fresno County north to near Chico in Butte County; has been extirpated from areas south of Fresno. Habitats include sloughs, canals, low-gradient streams and freshwater marsh. Also inhabits irrigation ditches and rice fields. Requires grassy banks and emergent vegetation for basking and high ground areas above winter floodwater for cover, estivation.	**None**. No suitable aquatic or upland habitat is present in the study area. The species has historically been found in association with emergent marsh on the valley floor in the floodplain of the San Joaquin River. There are no CNDDB records within 5 miles of the study area. The nearest CNDDB record is approximately 16 miles from the study area.
Western pond turtle	*Emys marmorata*	-/SSC	Occurs throughout California west of the Sierra-Cascade crest. Occurs from the Oregon border of Del Norte and Siskiyou Counties south along the coast to San Francisco Bay, inland through the Sacramento Valley, and on the western slope of Sierra Nevada. Occupies ponds, marshes, rivers, streams, and irrigation canals with muddy or rocky bottoms and with watercress, cattails, water lilies, or other aquatic vegetation in woodlands, grasslands, and open forests.	**Moderate**. Suitable aquatic habitat is present in the study area in Del Puerto Creek. No pond turtles were observed during surveys. There are no CNDDB records within 5 miles of the study area. The closest CNDDB record is approximately 7 miles west of the study area (from 1988; occurrence #60).
Western burrowing owl	*Athene cunicularia*	–/SSC	Lowlands throughout California, including the Central Valley, northeastern plateau, southeastern deserts, and coastal areas. Rare along south coast. Level, open, dry, heavily grazed or low-stature grassland or desert vegetation with available burrows.	**Moderate**. Suitable grassland habitat with small mammal burrows is present in the study area. No burrowing owls were observed in the study area during reconnaissance level surveys. There are 2 CNDDB records within 5 miles of the study area, with the closest record within the study area (from 1991; occurrence #144).
Least Bell's vireo	*Vireo bellii pusillus*	E/E	Historically nested in riparian habitat throughout the Central Valley, western Sierra Nevada, and coastal valley and foothills. The current breeding population now restricted to southern California with recent documentation of nesting on the San Joaquin River west of Modesto. Inhabits dense riparian vegetation for nesting and a dense, stratified canopy for foraging. The least Bell's vireo is an obligate riparian breeder that occurs in early successional (5–10 years old) riparian scrub and woodlands with a developed canopy layer and dense shrubs (Franzreb 1989; Kus 2002; USFWS 2006)[7], but least Bell's vireos can use any age riparian habitat if such an understory is present. The most critical structural component of nesting habitat in California is a dense shrub layer 2–10 feet aboveground (USFWS 1998[6]; Kus 2002). A structurally diverse canopy for foraging is also very important; least Bell's vireo has been found to have	~~**None**~~**Low**. The study area is in the historic range of the species[6]. There has only been one documented nesting in the San Joaquin Valley in recent years but there are not sustained populations[7]. The study area supports minimal areas of riparian vegetation, which also lack the dense riparian vegetation required by the species[2]. There is 1 CNDDB record within Del Puerto

			a preference for foraging within the 10–20 foot zone.	

[6] U.S. Fish and Wildlife Service. 1998. Draft recovery plan for the least Bell's vireo. U.S. Fish and Wildlife Service, Portland, OR. 139 pp.
[7] U.S. Fish and Wildlife Service. 2006. Least Bell's vireo (*Vireo belli pusillus*) 5-Year Review Summary and Evaluation. U.S. Fish and Wildlife Service, Carlsbad, CA. September 2006.

				Canyon; however, the specific location within the canyon is unknown (from 1928; occurrence #509).
Loggerhead shrike	*Lanius ludovicianus*	–/SSC	Resident and winter visitor in lowlands and foothills throughout California; rare on coastal slope north of Mendocino County, occurring only in winter. Prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches.	**High**. Suitable nesting and foraging habitat are present in the study area and the species was observed during field surveys. There is 1 CNDDB record approximately 1.5 miles east of the study area (from 2002; occurrence #15).
Swainson's hawk	*Buteo swainsoni*	–/T	Lower Sacramento and San Joaquin Valleys, the Klamath Basin, and Butte Valley. Nests in oaks or cottonwoods in or near riparian habitats. Also utilizes isolated, roadside trees adjacent to foraging habitat. Forages in grasslands, irrigated pastures, alfalfa, grain fields, and various agricultural field and row crops.	**High**. Suitable nesting and foraging habitat are present in the study area and the species was observed during field surveys. There are 2 CNDDB records within 5 miles of the study area, with the closest record within the study area (from 1936; occurrence #2524).
Bald eagle	*Haliaeetus leucocephalus*	–/E,FP	Breeding mostly in Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Trinity Counties. Large wintering population in Klamath Basin and select locations in Southern California. Associated with aquatic habitats (coastal areas, rivers, lakes, reservoirs). Uses large bodies of water or flowing river with adjacent snags and perches for foraging. Nests in large trees with open branchwork near permanent water source.	**None**. Species was observed in flight during field surveys; however, large water bodies and large trees needed for foraging and nesting are absent from the study area. There are no CNDDB records within 5 miles of the study area. The closest CNDDB record is approximately 10.5 miles south of the study area (from 1988; occurrence #256).
Golden eagle	*Aquila chrysaetos*	–/FP	Foothills and mountains throughout California; uncommon nonbreeding visitor to lowlands such as the Central Valley; winter range spans most of California. Breeding range excludes the Central Valley. Ranges from sea level to around 11,500 feet. Rolling foothills, mountain ranges, sage-juniper flats, and desert. Nests on cliffs and escarpments or in tall trees overlooking open country. Forages in annual grassland, chaparral, and oak woodland with plentiful medium and large-sized mammals.	**High**. Suitable nesting and foraging habitat are present in the study area and the species was observed in flight during field surveys. There are no CNDDB records within 5 miles of the study area. The closest CNDDB record is approximately 10.5 miles south of the study area (from 2001; occurrence #85).
White-tailed kite	*Elanus leucurus*	–/FP	Lowland areas west of Sierra Nevada from the head of the Sacramento Valley south, including coastal valleys and foothills to western San Diego County at the Mexico border. Nests in low foothills or valley areas with valley or live oaks, riparian areas, and marshes near open	**High**. Suitable nesting and foraging habitat is present in the study area. There are no CNDDB records within 5 miles of the study area. The closest CNDDB record is approximately 21 miles from the study area.

			grasslands for foraging. Also uses dense-topped trees or shrubs, near open grassland and agricultural fields.	
Tricolored blackbird	*Agelaius tricolor*	–/T	Permanent resident in the Central Valley from Butte County to Kern County; breeds at scattered coastal locations from Marin County south to San Diego County and at scattered locations in Lake, Sonoma, and Solano Counties; rare nester in Siskiyou, Modoc, and Lassen Counties. Nests in dense colonies in emergent marsh vegetation, such as tules and cattails, or upland sites with blackberries, nettles, thistles, and grain fields; habitat must be large enough to support 50 pairs; probably requires water at or near the nesting colony. Ideal foraging habitat is composed of low growing, expansive grasslands and other upland habitats with abundant insect prey within generally within 5 km (3.11 mile) of nesting colony (Shuford and Gardali eds. 2008). In some cases, adults will travel much further to obtain insects for their young and the farthest distance documented is 8.6 km (5.34 miles)[8].	**Moderate**. Suitable foraging habitat is present in the study area; however, the study area supports minimal areas of emergent marsh or upland nesting sites, which are not large enough to support a nesting colony. There are 3 CNDDB records within 5 miles of the study area, with the closest record approximately 1.5 miles east of the study area (from 1972; occurrence #79).
Grasshopper sparrow	*Ammodramus savannarum*	-/SSC	Primarily a summer resident in California from March to September and spends winters in California on the coast slope of southern California. Occurs in short- to middle-height, moderately open grasslands with scattered shrubs. The species is more likely to be found in large tracts of habitat. Build nests at or near ground level in grass clumps (Shuford and Gardali eds. 2008).	**High.** Suitable habitat is present in the lower grassland portions of the study area. There are no CNDDB records within 5 miles of the study area but there are several eBird observations within the lower portion of Del Puerto Canyon during the breeding season.
Western red-bat	*Lasiurus blossevillii*	-/SSC	Occurs from Shasta County to the Mexican border, west of the Sierra Nevada/Cascade crest. Roosts in forests and woodlands, and forages in open habitats such as grasslands, shrublands, open woodlands and forests, and croplands. Roosts primarily in foliage of trees in riparian areas, often adjacent to streams, fields, or urban areas. Roosts range from 2-40 feet above the ground in trees that are protected from above and open below.	**Moderate**. Suitable roosting sites are present in riparian woodland and ornamental trees, and suitable open habitat for foraging is present in the study area. There are no CNDDB records within 5 miles of the study area. The closest CNDDB record is approximately 14 miles from the study area.

[8] Hamilton, W. J. and R. J. Meese. 2005. Habitat and population characteristics of tricolored blackbird colonies in California, Final Report. Prepared for the California Department of Fish and Game Habitat Conservation Planning Branch, Sacramento, CA. January 3, 2006.

Pallid bat	*Antrozous pallidus*	-/SSC	Range throughout the southwestern US from interior British Columbia to Mexico. Tends to inhabit foothills and lowlands near water throughout California below 6,562 feet. Occurs in deserts, grasslands, shrublands, woodlands and forests. Most common in open, dry habitats with rocky areas for roosting. A yearlong resident in most of the range. Day roosts are in caves, crevices in rocky outcrops and cliffs, mines, and occasionally in tree hollows and various human structures such as bridges (especially wooden and concrete girder designs), barns, porches, bat boxes, and human-occupied as well as vacant buildings[9]. Prefers roosts with unobstructed exit/entrances, high above ground, with access to open habitats for foraging. Can be found roosting on the ground under stone piles, rags and baseboards[7]. Night roosts may be in more open sites, such as porches and open buildings.	**Moderate.** Suitable roosting habitat joints in Del Puerto Creek culvert beneath I-5, abandoned structures, rock outcrops, and trees with cavities in riparian woodlands. Suitable open habitat for foraging is present in the study area. There are no CNDDB records within 5 miles of the study area. The closest CNDDB record is approximately 12 miles from the study area.
Western mastiff bat	*Eumops perotis californicus*	-/SSC	Occurs in San Joaquin Valley and Coastal Ranges from Monterey County to Southern California, west of the Colorado Desert. Found in open, semi-arid or arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, chaparral, desert scrub, and urban. Day roosts are primarily in crevices in cliffs, but can also be found in buildings, trees, and tunnels. Vertical faces are needed when roosting in rock outcrops in order to drop off to take flight. Roost sites are primarily high above ground level. Forages for a variety of insects in broad, open areas.	**Moderate**. Suitable rocky outcrops and joints within the Del Puerto Creek culvert beneath I-5 represent suitable roosting habitat and suitable open habitat for foraging are present in the study area. There are no CNDDB records within 5 miles of the study area. The closest CNDDB record is approximately 17 miles from the study area.
American badger	*Taxidea taxus*	–/SSC	Occurs throughout most of California, except in humid coastal forests of northwestern California in Del Norte and Humboldt Counties. Found in drier open stages of most shrub, forest, and herbaceous habitats with friable soil (grassland, savannas, mountain meadows and open areas of desert scrub). Digs burrows for cover and for breeding. Dens usually located in sandy soil in areas with sparse overstory cover.	**High**. Suitable habitat with friable soils is present in the study area, and burrows with badger diggings were observed during field surveys. There is 1 CNDDB record within 5 miles of the study area, approximately 3 miles south of the study area (from 1989, occurrence #71).
San Joaquin kit fox	*Vulpes macrotis mutica*	E/T	Currently distributed through the San Joaquin Valley floor and foothills from southern Kern County north to central Contra Costa, eastern Alameda and	**Moderate**. Suitable open grassland and friable soils are present in the study area, and burrows that range

[9] Western Bat Working Group. 2005. Species Account. Pallid bat. Updated by D.A. Rambaldini. Available < http://wbwg.org/western-bat-species/>.

			southwestern San Joaquin Counties on the west and near La Grange, Stanislaus County on the east side of the Central Valley. Satellite populations and individuals have been reported on the western edge of the San Joaquin Valley, with the most northern record in Contra Costa County. North of Santa Nella, kit foxes may only be intermittently present and largely consist of individuals dispersing from populations further south. There are no known kit fox populations present in the northern range. Arid-adapted and typically occurs in desert-like habitats characterized by sparse or absent shrub cover, sparse ground cover, and short vegetation. Also found in California annual grassland habitat and altered habitat. Associated with open, level, loose-textured sandy soils for burrowing, and sufficient prey base (small rodents, preferably kangaroo rats). Utilizes subsurface dens.	between 5 to 8 inches in diameter were observed during field surveys. There are 4 CNDDB records within 5 miles of the study area, with the closest record within the study area (from 1973, occurrence #80).

[a] Status explanations:

Federal

E = listed as endangered under the federal Endangered Species Act.

T = listed as threatened under the federal Endangered Species Act.

– = no listing.

State

E = listed as endangered under the California Endangered Species Act.

T = listed as threatened under the California Endangered Species Act.

CT = candidate for state threatened listing under the California Endangered Species Act.

FP = California fully protected species.

SSC = species of special concern in California.

– = no listing.

APPENDIX B5: Special-Status Wildlife Species Accounts (excluding listed and fully protected species)

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This appendix identifies and describes non-listed special-status species that have the potential to occur within the study area for the Del Puerto Reservoir project. Listed and fully protected species are described in Section 3.4, *Terrestrial Biological Resources*.

Species Accounts

Western Spadefoot Toad

Western spadefoot toad is a California species of special concern. It occurs in the Sierra Nevada foothills, Central Valley, Coast Ranges, and coastal counties in Southern California, from sea level to 4,460 feet (Zeiner et al. 1990). Breeding occurs in temporary rain pools or seasonal pools in streams with water temperatures between 48 and 86 degrees Fahrenheit (U.S. Fish and Wildlife Service 2005). It is not known how far western spadefoot toads may range from aquatic habitat into upland habitat; however, research suggests that upland habitat, on average, falls within 1,207 feet of aquatic habitat (U.S. Fish and Wildlife Service 2005a). It spends the majority of its life underground in self-constructed burrows, primarily in grasslands and occasionally in valley-foothill hardwood woodlands (Zeiner et al. 1990). Above-ground activity is primarily nocturnal (U.S. Fish and Wildlife Service 2005a).

There are four CNDDB occurrences within 5 miles of the study area, with the closest occurrence just outside the southwestern boundary of the study area (California Department of Fish and Wildlife 2019). Potential aquatic habitat for western spadefoot toad is present in Del Puerto Creek and associated riparian wetlands and in the stock pond shown in Figure 3.4-3: California Tiger Salamander Habitat, and suitable upland habitat is present in grasslands throughout the study area.

Western Pond Turtle

The western pond turtle is a California species of special concern. It occurs throughout California west of the Sierra-Cascade crest and below 4,690 feet (Zeiner et al. 1990). It inhabits permanent or semi-permanent water, including ponds, marshes, rivers, streams, and irrigation canals. Suitable aquatic habitat contains basking sites such as logs, rocks, floating vegetation, or mud banks (Zeiner et al. 1990). Eggs are laid from March to August, and nesting sites occur up to 325 feet from aquatic habitat in a variety of soil types (Zeiner et al. 1990).

There are no CNDDB occurrences within 5 miles of the study area. The closest CNDDB occurrence is approximately 7 miles west of the study area (California Department of Fish and Wildlife 2019). Potential aquatic habitat for western pond turtle is present in the study area in Del Puerto Creek.

Blainville's Horned Lizard

The Blainville's horned lizard is a California species of special concern. It occurs in the Sierra Nevada foothills from Butte County to Kern County, and the central and southern California coasts, usually below 2,000 feet in the north and 3,000 feet in the south (Zeiner et al. 1990). It inhabits open areas of sandy soils and low vegetation in a variety of habitats, often by ant nests. Blainville's horned lizards burrow into loose soil to escape predators and extreme heat, and use rocks, mammal burrows, or crevices for periods of inactivity (Zeiner et al. 1990). Eggs are laid in nests in loose soil and hatching occurs after two months (Zeiner et al. 1990). Most activity occurs during the middle of the day in spring and fall, and in the morning and late afternoon in mid-summer, with nocturnal activity sometimes occurring during warm periods (Zeiner et al. 1990).

There are no CNDDB occurrences within 5 miles of the study area. The closest CNDDB occurrence is approximately 15.5 miles from the study area (California Department of Fish and Wildlife 2019). Potential habitat for Blaineville's horned lizard is present in areas of sandy washes and within grasslands in the study area.

Northern California Legless Lizard

The Northern California legless lizard is a California species of special concern. It occurs in the Coast Ranges from Contra Costa County to the Mexican border, with spotty occurrences in the San Joaquin Valley, the Tehachapi Mountains, and the mountains of Southern California (Zeiner et al. 1990). The species inhabits a variety of habitats with loose soils, sandy washes, or thick duff or leaf litter, and often where substrates are slightly moist (Zeiner et al. 1990).

There is one CNDDB occurrence within 5 miles of the study area, approximately 5 miles southwest of the study area (California Department of Fish and Wildlife 2019). Potential habitat for northern California legless lizard is present in areas of sandy washes and within grasslands in the study area.

San Joaquin Coachwhip

The San Joaquin coachwhip is a California species of special concern. It occurs in arid regions below 7,700 feet from Colusa County in the Sacramento Valley southward to the grapevine in the San Joaquin Valley and westward into the inner Coast Ranges, with an isolated population at Sutter Buttes. It inhabits open, dry, vegetative associations, and it most abundant in grass, desert, scrub, chaparral, and pasture habitats (Zeiner et al. 1990). Coachwhips use small mammal burrows, bushes, and rock piles for cover. The species is diurnal and is usually active mid-morning and late afternoon (Zeiner et al. 1990).

There is one CNDDB occurrence within 5 miles of the study area, approximately 1 mile east of the study area (California Department of Fish and Wildlife 2019). Potential habitat for San Joaquin coachwhip is present in grasslands and coastal scrub throughout the study area.

Western Burrowing Owl

The western burrowing owl is a California species of special concern. It occurs year-round in lowlands throughout California, including the Central Valley, northeastern plateau, southeastern deserts, and coastal areas. It inhabits open, dry, grassland or desert with available small mammal burrows and forages on insects, small mammals, reptiles, birds, and carrion (Zeiner et al. 1990). Small mammal burrows are used for roosting and nesting; nests have also been observed in buildings, pipes, culverts, and nest boxes where burrows are scarce. Peak breeding occurs in April and May (Zeiner et al. 1990).

There are two CNDDB occurrences within 5 miles of the study area, with the closest occurrence inside the study area (California Department of Fish and Wildlife 2019). Potential habitat for western burrowing owl is present in grasslands throughout the study area, and numerous ground squirrel burrows that could be utilized by western burrowing owl were observed during the wildlife surveys.

Loggerhead Shrike

The loggerhead shrike is a California species of special concern. The species occurs year-round in lowlands and foothills throughout California, and only in winter on the coastal slope north of Mendocino County (Zeiner et al. 1990). It inhabits open habitats with perches such as scattered shrubs, trees, posts, fences, or utility lines. (Zeiner et al. 1990). Loggerhead shrike forage primarily on large insects, but also eat small birds, mammals, amphibians, reptiles, fish, and carrion. Nests are built in trees or shrubs with dense foliage, typically 1.3 to 50 feet above the ground. Eggs are laid from March to May, and young become independent in July or August (Zeiner et al. 1990).

There is one CNDDB occurrence within 5 miles of the study area, approximately 1.5 miles east of the study area (California Department of Fish and Wildlife 2019). Potential habitat for loggerhead shrike is present throughout the study area and the species was observed during the wildlife surveys.

Grasshopper Sparrow

Grasshopper sparrow is a California species of special concern. Grasshopper sparrow occurs in California along the length of the coast and inland in the Central Valley and adjacent foothills from Shasta County south Fresno County where the range becomes restricted to the adjacent lower foothills (Shuford and Gardali eds. 2008). Occurs in short- to middle-height, moderately open grasslands with scattered shrubs. The species is more likely to be found in large tracts of habitat. Build nests at or near ground level in grass clumps (Shuford and Gardali eds. 2008).

There are no CNDDB occurrences for grasshopper sparrow within 5 miles of the study area (California Department of Fish and Wildlife 2019); however, there are multiple observations of the species on eBird during the breeding season (eBird 2019). The grasslands in the lower portions of the study area are suitable for this species.

Western Red Bat

The western red bat is a California species of special concern. The species occurs from Shasta County to the Mexican border, west of the Sierra Nevada crest. Most individuals in California make short migrations in March-May and September-October between winter and summer habitats (Zeiner et al. 1990). Roosting occurs primarily in trees (sometimes in shrubs) in forests and woodlands from sea level up to mixed conifer forests, typically 2-40 above the ground. Foraging occurs at night in a variety of open habitats, including grasslands, shrublands, open woodlands and forests, and croplands. Western red bats usually do not roost with other species but may forage with other species (Zeiner et al. 1990).

There are no CNDDB occurrences within 5 miles of the study area. The closest occurrence is approximately 14 miles from the study area (California Department of Fish and Wildlife 2019). Potential roost trees for western red bat are present in the study area in riparian woodland and ornamental trees, and potential foraging habitat is present in open areas throughout study area

Pallid Bat

The pallid bat is a California species of special concern. The species occurs throughout the state except for the high Sierra Nevada from Shasta to Kern Counties, and the northwestern corner from Del Norte and western Siskiyou Counties to Mendocino County, from sea level up to mixed conifer forests. Pallid bats use a variety of habitats such as grasslands, shrublands, woodlands, and forests, but are most common in open, dry areas with rock outcrops or cliffs for roosting (Zeiner et al. 1990). Pallid bats forage over open ground for a wide variety of insects and arachnids. They are a yearlong resident in most of their range and hibernate in winter near their summer roost. Roosting sites must protect bats from high temperatures, and include caves, crevices, mines, and occasionally hollow trees and buildings. Night roosts may include porches and open buildings (Zeiner et al. 1990). Pallid bats are known to roost with other species of bats. Roost sites are essential for economic metabolism and growth, and pallid bats are sensitive to disturbance of roosting sites (Zeiner et al. 1990).

There are no CNDDB occurrences within 5 miles of the study area. The closest occurrence is approximately 12 miles from the study area (California Department of Fish and Wildlife 2019). Potential roost sites for pallid bat are present in rocky outcrops and trees with cavities in the study area, as well as a the abandoned structures in the study area and in joints in the culvert beneath I-5, which was observed to be occupied by bats, which at least included Mexican free-tailed bats (*Tadarida brasiliensis*) based on two dead juvenile bats found beneath one of the joints. Potential foraging habitat is present in open areas throughout the study area.

Western Mastiff Bat

Western mastiff bat is a California species of special concern. The species occurs in southeastern San Joaquin Valley, Coastal Ranges from Monterey County to southern California, and from the coast eastward to the Colorado Desert (Zeiner et al. 1990). Wester mastiff bats use a variety of open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, chaparral, and desert scrub. Suitable roosting habitat includes rock outcrops and buildings for roosting, with vertical faces to allow room to drop off to take flight (Zeiner et al. 1990). Western mastiff bats forage at night and rarely use night roosts. Western mastiff bats are known to commonly share roosts with other large bat species (Zeiner et al. 1990).

There are no CNDDB occurrences within 5 miles of the study area. The closest occurrence is approximately 17 miles from the study area (California Department of Fish and Wildlife 2019). Potential roost sites for western mastiff bat are present in rocky outcrops, the joints within the culvert beneath I-5, and in the abandoned structures within the study area. Potential foraging habitat is present in open areas throughout the study area.

American Badger

The American badger is a California species of special concern. American badgers occur throughout the state except for the humid coastal forests of northwestern California in Del Norte and Humboldt Counties (Williams 1986). American badgers occur in a wide variety of open, arid habitats including shrub, forest, and herbaceous habitat, but most commonly are associated with grasslands, savannas, mountain meadows, and open areas of desert scrub. They require sufficient food (burrowing rodents), friable soils, and relatively open, uncultivated ground (Williams 1986). Badgers dig burrows for cover and reproduction, and frequently reuse old burrows (Zeiner et al. 1990). Dens are usually located in sandy soil in areas with sparse overstory cover. American badgers are active yearlong, and day and night (Zeiner et al. 1990).

There is one CNDDB occurrence within 5 miles of the study area, approximately 3 miles south of the study area (California Department of Fish and Wildlife 2019). Potential habitat for American badger is present in grasslands, coastal scrub, and oak woodlands throughout the study area, and numerous ground squirrel burrows and several burrows with badger diggings were observed in the study area during the wildlife surveys.

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APPENDIX B6: PHOTO LOG

Photo 1. View of seasonal pond within the east portion of the study area looking north

Photo 2. View of seasonal wetland looking east along Del Puerto Canyon Road

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Appendix B6
Photos of Biological Communities in the Del Puerto Canyon Reservoir Study Area

Photo 3. View of seasonal wetland looking west along Del Puerto Canyon Road

Photo 4. View of seasonal wetland within the southeast portion of the study area looking northwest

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Photo 5. View of cattle stock pond within the southeastern portion of the study area looking north

Photo 6. View of rock outcrop within the western portion of the study area looking south

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Appendix B6
Photos of Biological Communities in the Del Puerto Canyon Reservoir Study Area

Photo 7. View of Del Puerto Creek before grazing within the middle of the study area looking east

Photo 8. View of Del Puerto Creek after grazing within the middle of the study area looking west

Photo 9. View of Del Puerto Creek with grazed banks within the middle of the study area looking west

Photo 10. View of Del Puerto Creek within the middle of the study area looking west

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Photo 11. View of Del Puerto Creek within the middle of the study area looking west

Photo 12. View of grass bank with seeps and riparian wetlands and riparian woodland along Del Puerto Creek in the western portion of the study area looking east

Photo 13. View of Del Puerto Creek looking west from the California Aqueduct with I-5 in the background

Photo 14. View of Del Puerto Creek and former California Department Forestry station and corrals looking southeast from the northern portion of the study area

Photo 15. View of elderberry shrubs along Del Puerto Canyon Road from within the western portion of the study area looking southeast

Photo 16. View of Del Puerto Creek within the western portion of the study area looking west

Photo 17. View of deep pool within Del Puerto Creek looking west from within the western portion of the study area

Photo 18. View of Del Puerto Creek within the western portion of the study area looking west

Photo 19. View of riparian habitat along Del Puerto Creek within the western portion of the study area looking west

Photo 20. View of Del Puerto Creek within the western portion of the study area looking northeast

Photo 21. View of abandoned orchard within the east portion of the study area looking northeast

Photo 22. View of abandoned orchard within the east portion of the study area looking east

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APPENDIX C: Regional Prehistoric and Historic Context

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C.1 Introduction

As a result of continuing research and interpretation, the archaeological record of the Central Valley region has been approached in two fundamentally different ways; the first is chronological, and the second involves the clarification of contemporaneous cultural patterns. The discussion in this section is a succinct description of both approaches to Central Valley prehistory, beginning with the nascent, salvage-oriented archaeology of the late nineteenth century, followed by the development of cultural historical frameworks for the Central Valley under the support of Sacramento Community College and the University of California. The discussion below defines the terms used in the cultural resources evaluation and describes the cultural resource conditions of the region and study area. The discussion in this section moves from a chronologically oriented approach to the functional and systems approaches favored in California archaeology from the 1960s through the present.

C.2 Regional Setting

Regional Prehistory

In the late 1800s and early 1900s, knowledge of Delta prehistory was derived largely from local collectors. The collections of J. A. Barr and E. J. Dawson, amateur archaeologists working in the Stockton area from 1893 to the early 1930s, provided the groundwork for the later development of a three-phase chronological sequence for central California (Ragir 1972). Professional archaeological research in the lower Sacramento Valley was initiated during the 1920s and 1930s. Lillard and Purves (1936) worked at several mound sites near the Deer Creek/Cosumnes River confluence in Sacramento County. From the relative sequences in stratified occupational and burial sites, Lillard and Purves identified a three-stage chronology based on artifacts, burial orientation, and condition. Simply called the Early, Transitional (later called Middle), and Late horizons, these were defined by shifting patterns in site assemblages and mortuary morphology. Although interpretations varied, explanations for change were usually linked to the movements of people. In 1939, a synthesis of this research was published and later expanded into the Central California Taxonomic System (CCTS) (Lillard et al. 1939). Later refined by Heizer (1949) and Beardsley (1948, 1954a, 1954b), the CCTS was characterized by specific artifact types, mortuary practices, and other cultural features.

Subsequent archaeological research was aimed at refining the CCTS and incorporating the study of paleoenvironmental change, settlement patterns, population movement, subsistence strategies, and development of exchange networks. These studies led to the development of a second approach. As absolute dates became available for sites with early, middle, and late assemblages, it was discovered that sites with different assemblages actually were contemporaneous. This was particularly true with sites from the Early and Middle horizons. This discovery, along with a change in archaeological paradigms to a more economic and functional orientation in the 1960s, led to a reorganization of the CCTS. This new scheme used the same archaeological manifestations to differentiate sites as did the CCTS, but ordered sites into functional groups rather than temporal ones, which led to the establishment of different cultural models for many localities of central California.

This approach was advanced by Fredrickson (1973), who used the term pattern to describe an “adaptive mode extending across one or more regions, characterized by particular technological skills and devices, and particular economic modes.” Three patterns were introduced: Windmiller, Berkeley, and Augustine. These patterns, while generally corresponding to the Early, Middle, and Late horizons within the Central Valley, were conceptually different and free of spatial and temporal constraints. By changing the paradigm from a cultural/historical orientation to a more processual/adaptive one and introducing the concept of pattern, Fredrickson addressed problems with the chronological and regional sequences that had been nagging archaeologists for several decades (cf. King 1974).

One problem with both approaches is that they have been based on an archaeological record derived primarily from village sites. While not a significant problem under a chronological framework, this presents a more substantial problem when an economic perspective is taken. Current understanding of the prehistoric valley settlement and subsistence systems is heavily biased toward large habitation sites adjacent to permanent water sources. These sites, by their very nature, can provide only limited information on the total economic system. Much more archaeological work is needed at ephemeral and peripheral sites located away from the larger habitation sites.

The taxonomic framework of the Sacramento Valley has been described in the following sections in terms of archaeological patterns, following Fredrickson's (1973) system. A pattern is a general mode of life characterized archaeologically by technology, particular artifacts, economic systems, trade, burial practices, and other aspects of culture. Fredrickson's (1973) periods are also employed in the discussion of Paleoindian (12,000–8000 BP), Lower Archaic (8000–5000 BP), Middle Archaic (5000–2500 BP), Upper Archaic (2500–950 BP), Lower Emergent (950–450 BP), and Upper Emergent (450–150 BP) (White et al. 2002: Figure 15). In Fredrickson's use, periods served as arbitrary intervals that could be used to compare patterns over space and time. Only with the clear identification of pervasive temporal patterns would periods acquire specific archaeological meaning.

Terminal Pleistocene and Early Holocene: 13,500–7000 BP

At the end of the Pleistocene (roughly the beginning of the Paleoindian Period), circa 13,500 to 10,500 BP, parts of the Sierra Nevada adjacent to the Central Valley were covered with large glaciers (West et al. 2007:27), and the valley provided a major transportation route for animals and people. This transportation corridor, perhaps rivaled only by maritime coastal travel (Erlandson et al. 2007), was undoubtedly used heavily by early Californians. Evidence of human occupation during this period, however, is scarce, the hypothesized result of being buried by deep alluvial sediments that accumulated rapidly during the late Holocene (Westwood 2005:17).

Although rare, archaeological remains of this early period have been reported in and around the Central Valley. Johnson (1967:283–284) presents evidence for some use of the Mokelumne River area, under what is now Camanche Reservoir (50 miles northeast of the project), during the late Pleistocene. Archaeologists working at Camanche Reservoir found a number of lithic cores and a flake that are associated with Pleistocene gravels. These archaeological remains were grouped into what is called the Farmington Complex, which is characterized by core tools and large, reworked percussion flakes (Treganza and Heizer 1953:28). Recent geoarchaeological investigations at CA-STA-69 (in the vicinity of Farmington Complex–type site CA-STA-44), however, indicate that the Farmington Complex assemblage at the site is contained completely within Holocene alluvial terrace deposits, not Pleistocene glacial outwash deposits. These findings raise the question of whether reinvestigation of other Farmington Complex assemblages will reveal a Holocene assemblage (Rosenthal and Meyer 2004:96; Rosenthal et al. 2007:151).

The economy of the Central Valley residents during the late Pleistocene is thought to have been based on the hunting of large Pleistocene mammals. Although no direct evidence of this exists in the Central Valley, the similarity of the artifact assemblages with those of other locations in western North America lends some support the notion of a large-game economic focus. Much of the Pleistocene megafauna became extinct at the Pleistocene/Holocene transition. These extinctions were caused by warming temperatures, rising sea levels, and changing precipitation patterns. As the Central Valley gradually became both warmer and dryer, pine forests were replaced with vegetation similar to that found today. The rising sea level filled San Francisco Bay and created the Delta marshes. To survive without large game, people had to change their food procurement strategies to make use of a more diverse range of smaller plants and animals.

Middle to Late Holocene: 7000–1200 BP

Using a wider range of smaller resources meant people had to have access to larger areas of land to hunt and collect the food and other resources they needed. Small groups of people probably moved through the valley, foothills, and Sierra Nevada to take advantage of seasonally available resources and resources limited to particular ecozones. This mobile foraging strategy was essential to their survival.

Reliance on a diverse number of smaller plants and animals had several consequences. First, people had to move around from one area to another to take advantage of the seasonal availability of particular resources. Second, large areas of land were needed to ensure that enough resources were available throughout the year. Third, more specialized tools were necessary to procure and process the wider range of plants and animals that were being used. This generalized subsistence strategy worked well for the inhabitants of the Central Valley for many millennia.

During the Lower Archaic Period, beginning approximately 6000 BP, a shift to a more specialized subsistence strategy began to take place. The more specialized strategy focused on ways of increasing the amount of food that could be produced from smaller portions of land. This change can be at least partially explained by the increasing numbers of people living in the Central Valley. An increased population is indicated by a much more abundant archaeological record and by dietary stress, as indicated by dental pathologies (Moratto 1984:203–204). As the population slowly increased, it became more difficult for people to obtain seasonally available resources across large areas of land. The beginnings of this intensification can be seen in the Middle-Archaic Windmiller Pattern (4500–2800 BP) and is based on the assemblage at the Windmiller site (CA-SAC-107). The Windmiller Pattern shows evidence of a mixed economy of game procurement and use of wild plant foods. Artifacts and faunal remains at Windmiller sites include seeds, a variety of small game, and fish. The archaeological record contains numerous projectile points and a wide range of faunal remains. Hunting was not limited to terrestrial animals, as evidenced by fishing hooks and spears that have been found in association with the remains of sturgeon (*Acipenser* sp.), salmon (*Oncorhynchus* sp.), and other fish. Plants also were used, as indicated by ground-stone artifacts and clay balls that were used for boiling acorn mush. The bone tool industry appears minimal but includes awls, needles, and flakers. Other characteristic artifacts include charmstones, quartz crystals, bone awls and needles, and abalone (*Haliotis* sp.) and olive snail (*Olivella* sp.) shell beads and ornaments. Trade is reflected in the material from which utilitarian, ornamental, and ceremonial objects were produced (Moratto 1984).

Windmiller Pattern origins are believed to be linked to the arrival of Utian peoples from outside California who were adapted to riverine and wetland environments (Moratto 1984). Windmiller sites are concentrated on low rises or knolls within the floodplains of major creeks or rivers. Such locations provided protection from seasonal flooding and proximity to riverine, marsh, and valley grassland biotic communities. People with a Windmiller adaptation buried their dead in formal cemeteries (suggesting a degree of sedentism) both within and separate from their villages, in a ritual context that included the use of red ochre, often rich grave offerings, and ventral extension with a predominantly western orientation (although other burial positions, such as dorsal extension and flexed, and cremations are also known) (Moratto 1984).

Settlement strategies during the Windmiller Pattern reflect seasonal adaptations—habitation sites in the valley were occupied during winter, but populations moved into the foothills during summer (Moratto 1984). The earliest evidence of widespread occupation of the lower Sacramento Valley/Delta region comes from several sites assigned to the Windmiller Pattern (previously, Early Horizon), dated ca. 4500–2800 BP (Ragir 1972). While the Windmiller Pattern is identified with the Delta, work at Camanche Reservoir has identified sites with Windmiller assemblages (Johnson 1967), indicating that other valley settings were also used by people exhibiting these adaptations (Beardsley 1948; Gerow 1974; Heizer 1949; Heizer and Fenenga 1939; Lillard et al. 1939; Ragir 1972; Schulz 1970).

Central Valley inhabitants responded to the Middle Archaic population increase in two ways. First, they used the marshlands of the Delta, which were much more extensive and rich in food resources than they are today. Second, they increased the use of the acorn as a food source. The acorn had been used before this time, but it became a much more predominant resource with specialized procurement and processing technologies. People following these strategies were more sedentary than they had been in the past, and village sites are found throughout the valley along rivers and near other areas with permanent sources of water. An economic shift from a foraging to a collecting strategy probably occurred during the Middle Archaic.

The result of the settlement and subsistence reorientation was a coeval, adaptive pattern with the Windmiller Pattern labeled the Berkeley Pattern (3500–2500 BP) (Fredrickson 1973). Windmiller Pattern sites seem to occur with more frequency in or near the Delta, while Berkeley Pattern sites tend to be more prevalent farther north. Berkeley Pattern sites are more numerous and more widely distributed than Windmiller sites and are characterized by deep midden deposits, suggesting intensified occupation and a broadened subsistence base. The Berkeley Pattern also has a greater emphasis on the exploitation of the acorn as a staple. A reduction in the number of handstones and millingstones and an increase in the number of mortars and pestles reflect this greater dependence on acorns. Although gathered resources gained importance during this period, the continued presence of projectile points and atlatls (spear-throwers) in the archaeological record indicates that hunting was still an important activity (Fredrickson 1973). Fishing technology improved and diversified, suggesting greater reliance on riverine estuarine resources. This pattern is also noted for its especially well-developed bone industry and such technological innovations as ribbon flaking of chipped stone artifacts.

Material culture similarities to the Windmiller Pattern include mortars and millingstones, quartz crystals, charmstones, projectile points, shell beads and ornaments, and bone tools. New elements include steatite beads, tubes and ear ornaments, slate pendants, and burial of the dead in flexed positions with variable orientation or cremations accompanied by fewer grave goods. During this period, flexed burials are found alongside extended burials at CA-COL-247, contrary to the pattern elsewhere in the valley, which saw near exclusive use of flexed burials for interment of the deceased (Moratto 1984; Rosenthal et al. 2007:155; White 2003:175). The use of grave goods generally declined (Moratto 1984), and trade continued to be important (Beardsley 1948; Fredrickson 1973; Heizer and Fenenga 1939; Lillard et al. 1939; Moratto 1984).

A restricted land base, coupled with a more specialized resource base, meant that people had to develop economic relationships with other groups of people with different specialized resources living in other areas. Although resources and commodities were being exchanged throughout the region before this period, more extensive and more frequently used economic networks developed during this time. Transported resources likely included and commodities more visible in the archaeological record, such as shell and lithic materials (Rosenthal et al. 2007:155).

Late Horizon: 1200 BP to Historic Period

The trends toward specialization, exchange, and spatial circumscription that characterized prior periods continued in the Late Horizon. Population continued to increase, and group territories continued to become smaller and more defined. The Delta region of the Central Valley reached population density figures higher than almost any other area of North America (Chartkoff and Chartkoff 1984). Patterns in the activities, social relationships, belief systems, and material culture continued to develop during this period and took forms similar to those described by the first Europeans that entered the area.

The predominant generalized subsistence pattern during this period is called the Augustine Pattern (1200 BP) and shows a high degree of technological specialization (Fredrickson 1973). Development of the Augustine Pattern was apparently stimulated by the southward expansion of Wintuan populations into the Sacramento Valley (Moratto 1984). The Augustine Pattern reflects a change in subsistence and land-use patterns to those of the ethnographically known people of the historic era. This pattern exhibits a great elaboration of ceremonial and social organization, including the development of social stratification. Exchange became well developed, and an even more intensive emphasis was placed on the use of the acorn, as evidenced by the presence of shaped mortars and pestles and numerous hopper mortars in the archaeological record.

Other notable elements of the artifact assemblage associated with the Augustine Pattern include flanged tubular smoking pipes, harpoons, clam shell disc beads, bone awls for basketry, bone whistles, stone pipes, and an especially elaborate baked clay industry, which includes figurines and pottery vessels (Cosumnes Brownware). The presence of small projectile point types, referred to as the Gunther Barbed series, suggests the use of bow and arrow. Other traits associated with the Augustine Pattern include the introduction of preinterment burning of offerings in a grave pit during a mortuary ritual, increased village sedentism, maintenance of extensive exchange networks, population growth, and an incipient monetary economy in which beads were used as a standard of exchange (Moratto 1984). Burials were flexed with variable orientation and generally lacked grave goods (Beardsley 1948; Fredrickson 1973; Moratto 1984; Ragir 1972).

Ethnography

The study area was aboriginally inhabited by the Northern Valley Yokuts. Northern Valley Yokuts territory is bound by the crest of the Diablo Range to the west and the Sierra Nevada foothills to the east. The southern boundary is approximately where the San Joaquin River bends northward, and the northern boundary is roughly halfway between the Calaveras and Mokelumne Rivers. The Yokuts may have been fairly recent arrivals in the San Joaquin Valley, perhaps being pushed out of the foothills about 500 years ago (Wallace 1978:462–470).

Population estimates for the Northern Valley Yokuts vary from 11,000 to more than 31,000. Populations were concentrated along waterways and on the more hospitable east side of the San Joaquin River. Clusters of villages made up tribelets that were governed by headmen. The number of tribelets is estimated to have been 30 to 40. Each tribe spoke its own dialect of the Yokuts language. (Shipley 1978:83-84).

Principal settlements were located atop low mounds, on or near the banks of larger watercourses. Settlements were composed of single-family dwellings, sweathouses, and ceremonial assembly chambers. Dwellings were small, lightly constructed, semisubterranean, and oval. The public structures were large and earth-covered. Sedentism was fostered by the abundance of riverine resources in the area (Wallace 1978:462–470).

Subsistence among the Northern Valley Yokuts revolved around the waterways and marshes of the lower San Joaquin Valley. Fishing with dragnets, harpoons, and hook and line yielded salmon, white sturgeon, river perch, and other species of edible fish. Waterfowl and small game that were attracted to the riverine environment also provided sources of protein. The contribution of big game to the diet was probably minimal. Vegetal staples included acorns, tule roots, and seeds (Wallace 1978:462–470).

Goods not available locally were obtained through trade. Paiute and Shoshone groups on the eastern side of the Sierra Nevada were suppliers of obsidian. Shell beads and mussels were obtained from Salinan and Costanoan groups to the west. Trading relations with Miwok groups to the north yielded baskets and bows and arrows. Overland transport was facilitated by a network of trails, and tule rafts were used for water transport (Wallace 1978:462–470).

Most Northern Valley Yokuts groups had their first contact with Europeans in the late 1700s, when the Spanish began exploring the Delta. The gradual erosion of Yokuts culture began during the mission period, when escaped neophytes brought foreign (both European and Native American) habits and tastes back to their native culture, and Spanish expeditions to recover them followed. Epidemics of European diseases played a large role in the decimation of the native population. As a result of intensive proselytizing by the Spanish missionaries from 1805 to the 1820s, several Yokuts were removed from their tribal lands and relocated to the Missions to the west (Merriam 1955:188-225).

The secularization of the missions and release of neophytes set tribal and territorial adjustments in motion. Former neophytes returned to Native American groups other than their group of origin, and a number of polyglot “tribes” were formed. The final blow to the aboriginal population came with the Gold Rush and its aftermath. In the rush to the mines, native populations were pushed out or exterminated. Many natives became dependent on the Gold Rush economy for their subsistence, drastically changing their ways of life. Former miners who settled in the fertile valley applied further pressure to the native groups and altered the landforms and waterways of the valley. Many Yokuts resorted to wage labor on farms and ranches. Others were settled on land set aside for them on the Fresno and Tule River Reserves (Wallace 1978:462–470).

C.3 Historic Setting

Patterson

John D. Patterson purchased the entire Rancho del Puerto grant in 1866, eventually acquiring between 18,000 and 19,000 acres, where he raised sheep, shorthorn cattle and racing horses. The ranch was able to easily ship its goods, as it had both water-front property on the San Joaquin River and bordered the San Pablo and Tulare Extension Railroad, also known as the West Side Railroad, which was built between Tracy and Newman, south of Patterson, in

1888. Initially controlled by the Central Pacific, the San Pablo and Tulare RR became a subsidiary of the Southern Pacific in 1888 (Tinkham 1921: 185-186; Patterson Township Historical Society, June 1978).

After Patterson's passing, his heirs Thomas W. Patterson and John D. Patterson formed the Patterson Ranch Company in 1908. Patterson was founded as a colony town, laid out and platted for the sale of small ranches. The town itself is unique in that the downtown is laid out in a radial plan, similar to Pierre-Charles L'Enfant's 1791 plan for Washington D.C. The small ranch properties outside the downtown core were each given permanent water rights from the San Joaquin River, and 10 laterals supplied water to farmers. Between 1915 and 1920, mining in Del Puerto Canyon became profitable, and after mining operations shut down, cattle grazing in the canyons resumed (Patterson Township Historical Society, 1978).

By the twentieth century, Patterson had become a successful agricultural town, with a city hall, grammar school, bank, Carnegie Library (1921), and Palm, Eucalyptus and Sycamore-lined streets. The town incorporated in 1920 (Tinkham, 1921: 185-187). The largest changes to Patterson in the twentieth century were the Central Valley Project/State Water Project, with the Delta-Mendota Canal (DMC) and California Aqueduct (Aqueduct) at Patterson's western border, and the building of Interstate 5 in the 1960s.

The town continues to have an agricultural economic base, with orchards of apricots, almonds and walnuts, and row crops of beans, tomatoes, broccoli, spinach, peas and melons the main harvests. To the west of Patterson, industry is taking hold, with large shipping warehouses for companies such as Restoration Hardware using Patterson's advantageous location along the I-5 freeway (Tinkham 1921: 185-187).

Del Puerto Canyon

Del Puerto Canyon, which rises steeply above Del Puerto Creek, borders the city of Patterson to the west. While the San Joaquin Valley below Del Puerto Canyon has relied on orchard and row crops for its agricultural output since the late nineteenth century with the advent of irrigation, Del Puerto Canyon's terrain has meant that industry in the canyon has been historically limited to herd grazing and ranching, and a brief period of productive mining. The area was part of the Rancho del Puerto grant bought by John D. Patterson in 1866, and by the 1890s several homesteading claims had been made in the canyon. Early settlers attempted to raise goats and farmed sheep, and often dairy farmers within Patterson would use the lower foothills to feed their herds. Basque and Portuguese immigrants often worked in the canyon, living in tents or trailers as they followed their flocks. Several families eked out a living in this way, but were met with limited success, and claims and ranches changed hands often (Stanislaus Historical Quarterly, Spring 2010; Patterson Township Historical Society, May 1980).

Coal had been mined on a small scale in the canyon before 1870, but 1914 reports established that a supply of more important minerals were present. These included magnesite, manganese, chrome and quicksilver, all of which were becoming scarce as warfare shut down supplies from Europe. The Western Magnesite and Development Company had been mining about 25 miles from Patterson in the Canyon, but were sending their products to Livermore, with a horse and wagon. The trip was arduous at 31 miles, and extremely expensive. A new solution was sought by investors in San Francisco and citizens in Patterson; Hawaiian funders in Honolulu ended up funding the project via the Mineral Products Company. The group put up $150,000 for construction of what would become the single-gauge Patterson and Western Railroad. The rail line connected to the Southern Pacific Railroad in Patterson, enabling easy distribution for the various mining products found within the canyon. The first service ran on September 20, 1916. The railroad served only to transport mined products, and never served as passenger rail. It followed the course of Del Puerto Creek, up to Jones Station, and used multiple bridges to cross the creek, which crisscrosses in the bottom of Del Puerto Canyon and can seasonally swell with heavy rain. (Watts 1890; Lowell 1916; Patterson Township Historical Society, May 1980).

The life of the railroad was short-lived, as the ability to mine paying quantities of ore was extremely difficult. Furthermore, with the end of World War I in 1918, the import of minerals from abroad became feasible again for United States producers. The line was formally abandoned in 1920 with the consent of a ruling of the Public Utilities

Commission, and tracks, ties, bridges and other structures associated with the railroad were removed. However, the flat right-of-way where the railroad had previously run became the first roadway within the Canyon, known as Del Puerto Canyon Road. The abandonment of the railroad timed perfectly with the sharp rise of automobile usage in the United States, and ranchers within the canyon used the former railbed as means of transport within the canyon. However, with no county funding to improve the road, it was extremely rough going, and barely passable in some places. Although Del Puerto Canyon connects San Jose and Santa Clara County to the San Joaquin Valley, the steep 4,300 foot elevation increase, rough terrain, and the occasional deluge of the seasonal Del Puerto Creek meant that attempts to connect the two counties via Del Puerto Canyon Road were initially sparse. Del Puerto Road ended only about a mile from Mt. Hamilton Road in the San Antone Valley (also called San Antonio Valley) within Santa Cara County, and this fact led supporters to begin attempts to connect the two roads (Lowell 1916; Patterson Township Historical Society, May 1980).

The first formal attempt to connect the roads and improve the road within Del Puerto Canyon came from a relief program for young men within the county during the Great Depression, but the Stanislaus County Board of Supervisors eventually disbanded the relief program and built a prison labor camp. Prisoners were put to work improving the road and linking Mt. Hamilton Road to Del Puerto Canyon Road, but it was ranchers in the San Antone Valley who finally finished the work. The road improvement program was mostly abandoned during World War II, and in the decades after the war attempts to make the route part of the interstate system in California were repeatedly put forward. In 1959, the road was incorporated into the state highway system in a bill signed by Gov. Edmund G. Brown, and by 1964 Del Puerto Canyon Road became State Route 130, which extends from State Route 33 in Patterson, west through Del Puerto Canyon, into San Antone Valley and Mount Hamilton Road to the Lick Observatory and onwards into San Jose. The road is regularly maintained by the counties and the state (Patterson Township Historical Society, May 1980).

Modern Del Puerto Canyon does not have any mining activity, but ranching and grazing of stock herds still continues. The area is also used for recreation, with the Frank Raines OHV (Off Highway Vehicle) Park and various campsites, and the area is a favorite of recreational bikers, bird watchers and other outdoor enthusiasts.

Irrigation

In 1908, Patterson was founded as a colony town, a planned and organized area that sold lots to settlers. The Patterson Lift Irrigation System, built c. 1910, was the key that enabled agricultural cultivation that would allow settlers, and their new town, to flourish. The Patterson Water Company was formed to build and maintain the system. The company established senior water rights to the San Joaquin River, and built the entire canal system, including the Main Canal and its ten laterals, in a single construction episode. The lift system was the first of its kind in the western United States and used self-water regulation based on hydraulics. Unlike gravity fed systems that bring water down from higher elevations, depending on the force of the water to feed canals, the lift system innovated a way to move water without elevation change, a particular boon in the fairly flat San Joaquin Valley. Later, as hydroelectric power came to the San Joaquin Valley, electricity fueled water pumps that also fed the lift system. The Patterson Lift Irrigation System was constructed with concrete canals, which were uncommon in the early twentieth century (Patterson Irrigation District History; Applied Earthworks, 2014).

The Patterson Lift system helped Patterson Colony and then Patterson Township establish its agricultural dominance, and orchards and row crops, particularly apricot orchards, dominated local commerce. The Patterson Lock Irrigation System continues to serve its original purpose of irrigating the town of Patterson. The Patterson Water Company went on to become the Patterson Water Company, and later the Patterson Irrigation District, which still operates today. (Patterson Irrigation District History; Applied Earthworks, 2014).

As the population of Patterson expanded in the twentieth century, so too did the population of California. Huge water projects funded by both the federal and state governments were enacted, both of which had an impact on Patterson and Stanislaus County.

The Delta-Mendota Canal and the California Aqueduct

The Central Valley Project (CVP) (1933) and the State Water Project (SWP) (1960) are two massive water projects that defined water control in twentieth century California and continue to provide water for a diverse array of uses throughout the state. Two elements of these projects, The DMC and the Aqueduct, respectively, are present in the project area.

The CVP was launched in 1933 by the United State Bureau of Reclamation. The CVP is a substantial system of large canals and reservoirs that moves surplus water from the Sacramento River to the San Joaquin region, providing agricultural and residential irrigation and replacing water in the San Joaquin watershed that is directed to counties further south in the state. The CVP facilities operate as a comprehensive system with five core units: Shasta Dam, the Delta-Mendota Canal, Friant Dam, the Friant-Kern Canal, and the Contra-Costa Canal. These units were radically different from previous water conveyance systems in that they were designed to hold much larger amounts of water and were designed to endure. The DMC is 116 miles long and was built between 1946 and 1952; the canal was finished in the project area in 1951 and delivered water for Stanislaus County crops for the first time during the 1952 harvest. The canal conveys water from the Tracy Pumping Station in San Joaquin County to its terminus in Fresno County. The canal is designed to convey water from the Sacramento Delta into the San Joaquin River, replacing waters stored behind Friant Dam that would naturally supply the San Joaquin. (Cooper 1968: 50; Hart 1987: 87–88; JRP and Caltrans 2000: page 74-76; Pisani 1984: 434, 437; Patterson Township Historical Society June 1978).

Although the CVP was larger than any previous water project in California, it did not address all of California's water storage needs. The SWP Southern California counties that had refused to participate in the CVP nevertheless saw population growth circa World War II, accompanied by increased water demands. In 1945 the legislature passed the State Water Resources Act, which created and empowered the State Water Resources Control Board (SWRCB) with the authority to plan and develop resources to meet the state's growing postwar population and industry needs. After 6 years of study, the SWRCB found that much of northern California's fresh water flowed out to the ocean unused while southern California's waterbodies were not able to store and deliver water to meet its growing demands. (Cooper 1968: 203–204; JRP and Caltrans 2000: 80–82).

The legislature ordered more studies, and his vision gained new support following widespread flooding events in 1955. With flood control at the political forefront, the Burns-Porter Act was passed in 1959 allowing for the sale of $1.75 billion in infrastructure construction bonds. Despite its unprecedented price tag, voters approved the bonds. Construction on the Feather River Project, later renamed the SWP, began in 1960. Built between 1960 and 1974, the Aqueduct was designed and constructed as the main conduit for the system, running 444 miles from the Sacramento Delta to Riverside County. Within the project area the Aqueduct was complete by 1967 (Cooper 1968: 200, 223–225, 228, 241; JRP and Caltrans 2000: 82; Patterson Township Historical Society June 1976).

Within the project area, the Patterson Irrigation District gathers its waters from the DMC. The Aqueduct shares an intertie with the DMC, which helps control water between the CVP and the SWP. The DMC and the Aqueduct interact to aid water districts, the state and the federal government in routing and controlling water throughout the state.

Electrical Transmission

California has had an earnest interest in electrical driven hydroelectric power and electrical transmission since the early twentieth century, when massive transmission projects connected power generating mountainous regions such as the Sierra Nevada with the rest of the state. By 1920, large areas of California had access to this type of electric power. Initially these power grids were controlled by small municipal companies, but as time progressed the unreliability of a patchwork of service providers as well as extensive price-gouging led to federal regulation. Regulation led to integrated utility systems, as well as consolidation of various power companies throughout the state of California. The foremost company in this consolidation was Pacific Gas and Electric (PG&E), which had been purchasing smaller utilities since its inception in the 1850s, before the advent of hydroelectric power. Between 1924 and 1930, PG&E took its final form after purchasing two large power companies, San Joaquin Light & Power and Great Western Power (Cardno 2017).

PG&E ran transmission lines into the San Joaquin Valley, which allowed farmers in the area to power new electric water pumps to help increase the capabilities of their irrigation systems. Within the project area, this related directly to pulling water out of the San Joaquin River and pushing water into the various canals and laterals that helped support the agricultural economy of the valley. Patterson had electricity as early as 1911. Transmission lines, built by PG&E, crossed the project area to the west of Patterson beginning in the early 1920s, when PG&E bought the Sierra and San Francisco Power Company and Coast Valley Gas Company. These corporate buyouts increased PG&E usership within the San Joaquin Valley and the north-central coast. (Applied Earthworks, 2014, Patterson Township Historical Society, June 1978; Cardno Inc, August 2017).

After World War II, PG&E undertook a huge building campaign, seeking to expand, consolidate and improve its massive power grid throughout California. A small part of this transformative period occurred in the project area. The Salado Substation was built in 1951, and tied into the existing c. 1926 Manteca-Salinas powerline in order to meet growing demand in the San Joaquin Valley. In the 1970s, the line was again reconfigured to incorporate the Tesla Substation, which is the final configuration of the line, now known as Tesla-Salado-Manteca. An additional line, the Tesla-Salado #1 115 kV powerline, was added c. 1951-1963. The Quinto Switching Station-Westley 230 kV transmission line, part of the Los Banos-Westley 230 kV transmission line was built c. 1960 and runs parallel to Tesla-Salado #1. These lines helped service the Patterson and Del Puerto area.

Pacific Intertie

As part of their post-World War II building campaign, PG&E added eleven powerhouses to their system, creating the need for a transmission system that could handle the new high volume of output. The need to conduct energy at higher kilo-voltage than 230 kV led PG&E to participate in the creation of the Pacific Northwest-Pacific Southwest Intertie (Pacific Intertie). The intertie was the first collaboration between private, municipal, and federal utilities to transfer power transregionally between Oregon, California, Nevada and Arizona. The plan to conduct power across state lines to deal with surplus power was investigated practically from the inception of regional transmission networks, with an increase in interest after World War II when new technology and the consolidation of regional power companies was more complete. In1949 the Bureau of Reclamation conducted the first detailed investigation for a potential intertie between the Bonneville System and the Central Valley Project. More studies and memos followed in 1953, 1959 and 1961 and affirmed Reclamation's findings that such a system would be desirable. Operating on its own, PG&E proposed a 230,000-volt interconnection between 1959 and 1960, as well a "super system" in 1964. However, it was not until 1964 at the direction of President John F. Kennedy that Congress approved the plan for the intertie (Coleman 1952: 331-335l; Bureau of Reclamation 1997).

As planning got underway, engineers attempted to design the system that would work across the distances required of the intertie, which were two to three times greater than previous lines. Project engineers designed new towers, with "bundled" conductors which enabled towers to be placed further apart, saving money on tower construction. Use of High Voltage Direct Current (HVDC) and Extra-High Voltage (EHV) was an important engineering component of the project that broke barriers and enabled long distance transmission (Bureau of Reclamation 1997).

PG&E began construction in 1965, and had energized portions of its line as early as December 1965. By 1968, PG&E had finished its section of the intertie, and erected over 1,000 miles of 500 kV transmission line, the highest voltage it had ever conducted. The entire intertie was complete by 1970. The network continues to expand, providing power to millions of users. Within the project area, the Tesla-Los Banos #1 and Tracy-Los Banos 500 kV transmission lines were constructed in 1967 and 1968 and run parallel to the three other PG&E power and transmission lines at the base of Del Puerto Canyon, to the west of Interstate 5. Tracy-Los Banos was originally called Tesla-Los Banos #2, but was re-routed between 1987 and 1993, when the northern end of the line was redirected through the Tracy Substation. This line was the first of the two lines present to be electrified by PG&E in 1967. Another transmission line, the Moss Landing-Metcalf 500 kV line, is not in the project area but is part of the Pacific Intertie built by PG&E in the same time period, 1965-1968 (JRP 2019).

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APPENDIX D: CalEEMod Emissions Data - Revised

SCREEN3 Model Data

```
03/18/20
                                                                     14:33:31
  ***  SCREEN3 MODEL RUN  ***
  *** VERSION DATED 13043 ***

 C:\Lakes\Screen View\projects\delpuerto_CO\delpuerto_CO.scr

 SIMPLE TERRAIN INPUTS:
    SOURCE TYPE                  =        AREA
    EMISSION RATE (G/(S-M**2))  =     0.311938E-04
    SOURCE HEIGHT (M)            =       0.0000
    LENGTH OF LARGER SIDE (M)   =     291.5475
    LENGTH OF SMALLER SIDE (M)  =     291.5475
    RECEPTOR HEIGHT (M)          =       0.0000
    URBAN/RURAL OPTION           =        RURAL
 THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
 THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

    MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION


 BUOY. FLUX =    0.000 M**4/S**3;  MOM. FLUX =    0.000 M**4/S**2.

 *** FULL METEOROLOGY ***

 **********************************
 *** SCREEN AUTOMATED DISTANCES ***
 **********************************

 *** TERRAIN HEIGHT OF    0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

   DIST     CONC           U10M   USTK  MIX HT   PLUME  MAX DIR
   (M)   (UG/M**3)   STAB  (M/S)  (M/S)    (M)   HT (M)   (DEG)
 -------  ----------  ----  -----  -----  ------  ------  -------
     25.    4259.       6     1.0    1.0 10000.0    0.00     45.
    100.    4632.       6     1.0    1.0 10000.0    0.00     45.
    200.    5005.       6     1.0    1.0 10000.0    0.00     45.
    300.    2032.       6     1.0    1.0 10000.0    0.00     45.
    400.    1481.       6     1.0    1.0 10000.0    0.00     45.
    500.    1192.       6     1.0    1.0 10000.0    0.00     45.
    600.    1005.       6     1.0    1.0 10000.0    0.00     45.
    700.    874.7       6     1.0    1.0 10000.0    0.00     45.
    800.    778.5       6     1.0    1.0 10000.0    0.00     45.
    900.    705.2       6     1.0    1.0 10000.0    0.00     45.
   1000.    646.7       6     1.0    1.0 10000.0    0.00     45.

 MAXIMUM 1-HR CONCENTRATION AT OR BEYOND    25. M:
    207.    5028.       6     1.0    1.0 10000.0    0.00     45.

      ***************************************
      *** SUMMARY OF SCREEN MODEL RESULTS ***
      ***************************************

  CALCULATION        MAX CONC    DIST TO   TERRAIN
   PROCEDURE        (UG/M**3)    MAX (M)    HT (M)
 --------------    -----------   ---------   -------
 SIMPLE TERRAIN       5028.          207.        0.


 ***************************************************
 ** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
 ***************************************************
```

EPA AIRS CO Background Concentration Data

Monitor	Year	Highest Second High Concentration			
		1-hour (ppm)	8-hour (ppm)	1-hour (μg/m³)	8-hour (μg/m³)
Site ID: 060990005 Address: 814 14th St. City: Modesto County: Stanislaus	2016	1.8	1.4	2,061	1,603
	2017	2	1.6	2,290	1,832
	2018	2.5	1.9	**2,863**	**2,176**
	2019*	1.5	1	1,718	1,145
	Maximum	2.5	1.9	**2,863**	**2,176**

* incomplete year of monitoring data
Source: EPA AIRS Data. https://www.epa.gov/outdoor-air-quality-data/monitor-values-report, accessed 3/18/2020.

Del Puerto Canyon Reservoir Draft EIR

San Joaquin Valley Unified APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Refrigerated Warehouse-No Rail	95,858.00	1000sqft	2,200.60	95,858,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	45
Climate Zone	3			**Operational Year**	2028
Utility Company	Turlock Irrigation District				
CO2 Intensity (lb/MWhr)	790	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Off-road Equipment - project data

Off-road Equipment - project data (tranmission lines phase assume 5,000-hp helo crane use)

Grading -

Vehicle Trips - Based on Del_Puerto_Canyon_Reservoir_TIA_Draft_8-16-19.pdf traffic study - 149 VMT/day change

Consumer Products - No consumer products

Area Coating - project data

Landscape Equipment - landscape equipment use - 2 times per month

Energy Use - Based on estimated annual 40447020 kWh

Water And Wastewater - No operational water use

Solid Waste - No operational waste generation

Construction Off-road Equipment Mitigation - Standard fugitive dust control measures

Fleet Mix -

Architectural Coating - project data

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_EF_Nonresidential_Exterior	150	100
tblAreaCoating	Area_EF_Nonresidential_Interior	150	0
tblAreaCoating	Area_EF_Parking	150	0
tblAreaCoating	Area_EF_Residential_Exterior	150	0
tblAreaCoating	Area_EF_Residential_Interior	150	0
tblAreaCoating	Area_Nonresidential_Exterior	47929000	10581.16
tblAreaCoating	Area_Nonresidential_Interior	143787000	0
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	0	100
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	15,500.00	120.00

tblConstructionPhase	NumDays	6,000.00	720.00
tblConstructionPhase	NumDays	6,000.00	720.00
tblConstructionPhase	NumDays	6,000.00	200.00
tblConstructionPhase	NumDays	15,500.00	348.00
tblConstructionPhase	NumDays	6,000.00	120.00
tblConstructionPhase	NumDays	15,500.00	200.00
tblConstructionPhase	NumDays	6,000.00	770.00
tblConstructionPhase	NumDays	6,000.00	630.00
tblConstructionPhase	NumDays	6,000.00	580.00
tblConstructionPhase	NumDays	6,000.00	460.00
tblConstructionPhase	NumDays	6,000.00	840.00
tblConstructionPhase	NumDays	15,500.00	680.00
tblConstructionPhase	NumDays	6,000.00	80.00
tblConstructionPhase	NumDays	6,000.00	300.00
tblConstructionPhase	NumDays	15,500.00	80.00
tblEnergyUse	LightingElect	2.45	0.00
tblEnergyUse	NT24E	21.99	0.00
tblEnergyUse	T24E	0.47	0.42
tblEnergyUse	T24NG	0.15	0.00
tblGrading	AcresOfGrading	150.00	250.00
tblGrading	MaterialExported	0.00	12,044.00
tblGrading	MaterialExported	0.00	20,956.00
tblGrading	MaterialExported	0.00	5,300.00
tblGrading	MaterialExported	0.00	24,500.00
tblGrading	MaterialImported	0.00	4,175.00
tblGrading	MaterialImported	0.00	6,500.00
tblGrading	MaterialImported	0.00	297,000.00

tblGrading	MaterialImported	0.00	624,000.00
tblGrading	MaterialImported	0.00	9,240.00
tblLandscapeEquipment	NumberSummerDays	180	24
tblOffRoadEquipment	HorsePower	172.00	5,000.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	6.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	6.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	8.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	20.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	20.00

tblOffRoadEquipment	UsageHours	8.00	20.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	20.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	20.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	20.00
tblOffRoadEquipment	UsageHours	8.00	0.00

tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	20.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	20.00
tblOffRoadEquipment	UsageHours	8.00	20.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblSolidWaste	SolidWasteGenerationRate	90,106.52	0.00
tblTripsAndVMT	HaulingTripLength	20.00	75.00
tblTripsAndVMT	HaulingTripLength	20.00	75.00
tblTripsAndVMT	HaulingTripLength	20.00	75.00
tblTripsAndVMT	HaulingTripLength	20.00	75.00
tblTripsAndVMT	HaulingTripLength	20.00	75.00
tblTripsAndVMT	HaulingTripLength	20.00	75.00
tblTripsAndVMT	HaulingTripLength	20.00	75.00
tblTripsAndVMT	HaulingTripLength	20.00	75.00
tblTripsAndVMT	HaulingTripLength	20.00	75.00
tblTripsAndVMT	HaulingTripLength	20.00	75.00
tblTripsAndVMT	HaulingTripLength	20.00	75.00
tblTripsAndVMT	HaulingTripLength	20.00	75.00
tblTripsAndVMT	HaulingTripLength	20.00	75.00
tblTripsAndVMT	HaulingTripLength	20.00	75.00

tblTripsAndVMT	HaulingTripLength	20.00	75.00
tblTripsAndVMT	HaulingTripLength	20.00	75.00
tblTripsAndVMT	HaulingTripNumber	1,506.00	7.00
tblTripsAndVMT	HaulingTripNumber	2,620.00	7.00
tblTripsAndVMT	HaulingTripNumber	522.00	4.00
tblTripsAndVMT	HaulingTripNumber	1,475.00	6.00
tblTripsAndVMT	HaulingTripNumber	37,125.00	48.00
tblTripsAndVMT	HaulingTripNumber	78,000.00	108.00
tblTripsAndVMT	HaulingTripNumber	1,155.00	3.00
tblTripsAndVMT	HaulingTripNumber	3,063.00	41.00
tblTripsAndVMT	VendorTripLength	6.60	75.00
tblTripsAndVMT	VendorTripLength	6.60	75.00
tblTripsAndVMT	VendorTripLength	6.60	75.00
tblTripsAndVMT	VendorTripLength	6.60	75.00
tblTripsAndVMT	VendorTripLength	6.60	75.00
tblTripsAndVMT	VendorTripLength	6.60	75.00
tblTripsAndVMT	VendorTripLength	6.60	75.00
tblTripsAndVMT	VendorTripLength	6.60	75.00
tblTripsAndVMT	VendorTripLength	6.60	75.00
tblTripsAndVMT	VendorTripLength	6.60	75.00
tblTripsAndVMT	VendorTripLength	6.60	75.00
tblTripsAndVMT	VendorTripLength	6.60	75.00
tblTripsAndVMT	VendorTripLength	6.60	75.00
tblTripsAndVMT	VendorTripLength	6.60	75.00
tblTripsAndVMT	VendorTripLength	6.60	75.00
tblTripsAndVMT	VendorTripLength	6.60	75.00
tblTripsAndVMT	VendorTripNumber	0.00	3.00

tblTripsAndVMT	VendorTripNumber	0.00	6.00
tblTripsAndVMT	VendorTripNumber	0.00	10.00
tblTripsAndVMT	VendorTripNumber	0.00	5.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	17.00
tblTripsAndVMT	VendorTripNumber	0.00	9.00
tblTripsAndVMT	VendorTripNumber	0.00	5.00
tblTripsAndVMT	VendorTripNumber	0.00	3.00
tblTripsAndVMT	VendorTripNumber	0.00	8.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	WorkerTripLength	16.80	30.00
tblTripsAndVMT	WorkerTripLength	16.80	30.00
tblTripsAndVMT	WorkerTripLength	16.80	30.00
tblTripsAndVMT	WorkerTripLength	16.80	30.00
tblTripsAndVMT	WorkerTripLength	16.80	30.00
tblTripsAndVMT	WorkerTripLength	16.80	30.00
tblTripsAndVMT	WorkerTripLength	16.80	30.00
tblTripsAndVMT	WorkerTripLength	16.80	30.00
tblTripsAndVMT	WorkerTripLength	16.80	30.00
tblTripsAndVMT	WorkerTripLength	16.80	30.00
tblTripsAndVMT	WorkerTripLength	16.80	30.00
tblTripsAndVMT	WorkerTripLength	16.80	30.00
tblTripsAndVMT	WorkerTripLength	16.80	30.00
tblTripsAndVMT	WorkerTripLength	16.80	30.00
tblTripsAndVMT	WorkerTripLength	16.80	30.00
tblTripsAndVMT	WorkerTripLength	16.80	30.00
tblTripsAndVMT	WorkerTripNumber	73.00	37.00

tblTripsAndVMT	WorkerTripNumber	75.00	25.00
tblTripsAndVMT	WorkerTripNumber	25.00	13.00
tblTripsAndVMT	WorkerTripNumber	105.00	53.00
tblTripsAndVMT	WorkerTripNumber	20.00	10.00
tblTripsAndVMT	WorkerTripNumber	33.00	17.00
tblTripsAndVMT	WorkerTripNumber	78.00	39.00
tblTripsAndVMT	WorkerTripNumber	28.00	7.00
tblTripsAndVMT	WorkerTripNumber	78.00	39.00
tblTripsAndVMT	WorkerTripNumber	93.00	47.00
tblTripsAndVMT	WorkerTripNumber	5.00	3.00
tblTripsAndVMT	WorkerTripNumber	5.00	3.00
tblTripsAndVMT	WorkerTripNumber	8.00	4.00
tblTripsAndVMT	WorkerTripNumber	55.00	8.00
tblTripsAndVMT	WorkerTripNumber	8.00	4.00
tblTripsAndVMT	WorkerTripNumber	20.00	10.00
tblVehicleTrips	ST_TR	1.68	1.4695e-004
tblVehicleTrips	SU_TR	1.68	1.4695e-004
tblVehicleTrips	WD_TR	1.68	1.4695e-004
tblWater	IndoorWaterUseRate	22,167,162,500.00	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.8131	7.3463	7.4802	0.0133	2.0917	0.3562	2.4478	0.7068	0.3302	1.0370	0.0000	1,154.9791	1,154.9791	0.3246	0.0000	1,163.0932
2023	2.7931	26.8826	20.6672	0.0533	8.2143	1.1426	9.3569	3.7873	1.0528	4.8400	0.0000	4,690.6436	4,690.6436	1.4060	0.0000	4,725.7925
2024	5.8833	53.5696	44.7271	0.1241	17.2983	2.2083	19.5066	6.2480	2.0371	8.2851	0.0000	10,918.6650	10,918.6650	3.1696	0.0000	10,997.9047
2025	8.9902	74.2470	72.2373	0.2089	20.6133	2.9864	23.5998	8.3441	2.7609	11.1050	0.0000	18,339.7067	18,339.7067	5.3180	0.0000	18,472.6571
2026	7.3934	59.2279	58.5582	0.1727	16.9206	2.3688	19.2895	7.0746	2.1898	9.2644	0.0000	15,149.2282	15,149.2282	4.4798	0.0000	15,261.2232
2027	0.3638	3.0157	3.3052	8.4000e-003	0.1846	0.1179	0.3025	0.0300	0.1102	0.1402	0.0000	729.1428	729.1428	0.1956	0.0000	734.0321
Maximum	**8.9902**	**74.2470**	**72.2373**	**0.2089**	**20.6133**	**2.9864**	**23.5998**	**8.3441**	**2.7609**	**11.1050**	**0.0000**	**18,339.7067**	**18,339.7067**	**5.3180**	**0.0000**	**18,472.6571**

2.1 Overall Construction

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	0.8131	7.3463	7.4802	0.0133	0.9822	0.3562	1.3384	0.3292	0.3302	0.6593	0.0000	1,154.9778	1,154.9778	0.3246	0.0000	1,163.0919
2023	2.7931	26.8825	20.6672	0.0533	3.8345	1.1426	4.9771	1.7416	1.0528	2.7944	0.0000	4,690.6384	4,690.6384	1.4060	0.0000	4,725.7873
2024	5.8833	53.5696	44.7271	0.1241	8.1103	2.2083	10.3186	2.9013	2.0371	4.9384	0.0000	10,918.6532	10,918.6532	3.1696	0.0000	10,997.8928
2025	8.9902	74.2469	72.2372	0.2089	9.7416	2.9864	12.7280	3.8836	2.7609	6.6446	0.0000	18,339.6868	18,339.6868	5.3180	0.0000	18,472.6370
2026	7.3934	59.2278	58.5581	0.1727	7.9322	2.3688	10.3010	3.2715	2.1898	5.4613	0.0000	15,149.2115	15,149.2115	4.4798	0.0000	15,261.2063
2027	0.3638	3.0157	3.3052	8.4000e-003	0.1135	0.1179	0.2314	0.0218	0.1102	0.1320	0.0000	729.1421	729.1421	0.1956	0.0000	734.0313
Maximum	**8.9902**	**74.2469**	**72.2372**	**0.2089**	**9.7416**	**2.9864**	**12.7280**	**3.8836**	**2.7609**	**6.6446**	**0.0000**	**18,339.6868**	**18,339.6868**	**5.3180**	**0.0000**	**18,472.6370**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**52.98**	**0.00**	**46.45**	**53.61**	**0.00**	**40.50**	**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	**1-3-2022**	**4-2-2022**	3.6351	3.6351
2	**4-3-2022**	**7-2-2022**	3.1872	3.1872
4	**10-3-2022**	**1-2-2023**	1.3586	1.3586
5	**1-3-2023**	**4-2-2023**	3.7430	3.7430
6	**4-3-2023**	**7-2-2023**	5.7195	5.7195

7	**7-3-2023**	**10-2-2023**	10.1946	10.1946
8	**10-3-2023**	**1-2-2024**	10.1912	10.1912
9	**1-3-2024**	**4-2-2024**	8.6126	8.6126
10	**4-3-2024**	**7-2-2024**	9.3284	9.3284
11	**7-3-2024**	**10-2-2024**	15.4223	15.4223
12	**10-3-2024**	**1-2-2025**	26.1314	26.1314
13	**1-3-2025**	**4-2-2025**	24.2589	24.2589
14	**4-3-2025**	**7-2-2025**	21.9829	21.9829
15	**7-3-2025**	**10-2-2025**	19.5985	19.5985
16	**10-3-2025**	**1-2-2026**	17.1460	17.1460
17	**1-3-2026**	**4-2-2026**	16.6855	16.6855
18	**4-3-2026**	**7-2-2026**	16.7424	16.7424
19	**7-3-2026**	**10-2-2026**	16.8064	16.8064
20	**10-3-2026**	**1-2-2027**	16.2059	16.2059
21	**1-3-2027**	**4-2-2027**	1.2705	1.2705
22	**4-3-2027**	**7-2-2027**	1.1198	1.1198
23	**7-3-2027**	**9-30-2027**	0.8140	0.8140
		Highest	26.1314	26.1314

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0132	1.0600e-003	0.1171	1.0000e-005		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004	0.0000	0.2284	0.2284	5.9000e-004	0.0000	0.2432
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	14,493.7974	14,493.7974	0.5321	0.1101	14,539.9024
Mobile	3.7300e-003	0.0405	0.0428	2.8000e-004	0.0207	1.5000e-004	0.0209	5.5600e-003	1.4000e-004	5.7100e-003	0.0000	25.8853	25.8853	1.2000e-003	0.0000	25.9152
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0170**	**0.0415**	**0.1599**	**2.9000e-004**	**0.0207**	**5.7000e-004**	**0.0213**	**5.5600e-003**	**5.6000e-004**	**6.1300e-003**	**0.0000**	**14,519.9111**	**14,519.9111**	**0.5338**	**0.1101**	**14,566.0608**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0132	1.0600e-003	0.1171	1.0000e-005		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004	0.0000	0.2284	0.2284	5.9000e-004	0.0000	0.2432
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	14,493.7974	14,493.7974	0.5321	0.1101	14,539.9024
Mobile	3.7300e-003	0.0405	0.0428	2.8000e-004	0.0207	1.5000e-004	0.0209	5.5600e-003	1.4000e-004	5.7100e-003	0.0000	25.8853	25.8853	1.2000e-003	0.0000	25.9152
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0170**	**0.0415**	**0.1599**	**2.9000e-004**	**0.0207**	**5.7000e-004**	**0.0213**	**5.5600e-003**	**5.6000e-004**	**6.1300e-003**	**0.0000**	**14,519.9111**	**14,519.9111**	**0.5338**	**0.1101**	**14,566.0608**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Utilities - Petroleum Pipeline	Grading	1/3/2022	6/20/2022	5	120	Utilities - Petroleum Pipeline
2	Utilities - Transmission Lines (to be scaled)	Site Preparation	12/5/2022	9/8/2025	5	720	Transmission line construction to be scaled by ratio of actual construction days to modeled days
3	Transmission Lines PTs	Site Preparation	12/5/2022	9/5/2025	5	720	pickup trucks used during Transmission Line phase
4	Roadway - Excavation	Site Preparation	6/5/2023	3/11/2024	5	200	Roadway - Excavation
5	Roadway - Grading and Paving	Grading	3/11/2024	7/10/2025	5	348	Roadway - Grading and Paving
6	Dam Facilities - Site Preparation	Site Preparation	4/22/2024	10/7/2024	5	120	Dam Facilities - Site Preparation
7	Pumping Plant	Grading	6/17/2024	3/24/2025	5	200	Pumping Plant
8	Tunneling - Outlet and Conveyance	Site Preparation	7/15/2024	6/28/2027	5	770	Tunneling - Outlet and Conveyance
9	Dam Facilities - Saddle Dams	Site Preparation	8/12/2024	1/11/2027	5	630	Dam Facilities - Saddle Dams
10	Dam Facilities - Main Dam	Site Preparation	10/7/2024	12/28/2026	5	580	Dam Facilities - Main Dam
11	Dam Facilities - Outlet Works	Site Preparation	10/7/2024	7/13/2026	5	460	Dam Facilities - Outlet Works
12	Outlet Works PTs	Site Preparation	10/7/2024	12/27/2027	5	840	pickup trucks used during Outlet Works phase
13	Dam Facilities - Spillway	Grading	10/7/2024	5/17/2027	5	680	Dam Facilities - Spillway
14	Conveyance - Open Cut Trench	Site Preparation	12/30/2024	4/21/2025	5	80	Conveyance - Open Cut Trench
15	Open Cut Trench PTs	Site Preparation	12/30/2024	2/23/2026	5	300	pickup trucks used during Open Cut Trench phase
16	Dam Facilities - Site Restoration	Grading	5/17/2027	9/6/2027	5	80	Dam Facilities - Site Restoration

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Utilities - Petroleum Pipeline	Aerial Lifts	0	0.00	63	0.31
Utilities - Petroleum Pipeline	Air Compressors	0	0.00	78	0.48
Utilities - Petroleum Pipeline	Bore/Drill Rigs	0	0.00	221	0.50
Utilities - Petroleum Pipeline	Cement and Mortar Mixers	0	0.00	9	0.56
Utilities - Petroleum Pipeline	Concrete/Industrial Saws	0	0.00	81	0.73
Utilities - Petroleum Pipeline	Cranes	0	0.00	231	0.29
Utilities - Petroleum Pipeline	Crawler Tractors	0	0.00	212	0.43
Utilities - Petroleum Pipeline	Crushing/Proc. Equipment	0	0.00	85	0.78
Utilities - Petroleum Pipeline	Dumpers/Tenders	0	0.00	16	0.38
Utilities - Petroleum Pipeline	Excavators	2	10.00	158	0.38
Utilities - Petroleum Pipeline	Forklifts	0	0.00	89	0.20
Utilities - Petroleum Pipeline	Generator Sets	0	0.00	84	0.74
Utilities - Petroleum Pipeline	Graders	0	0.00	187	0.41
Utilities - Petroleum Pipeline	Off-Highway Tractors	0	0.00	124	0.44
Utilities - Petroleum Pipeline	Off-Highway Trucks	0	0.00	402	0.38
Utilities - Petroleum Pipeline	Other Construction Equipment	8	10.00	172	0.42
Utilities - Petroleum Pipeline	Other General Industrial Equipment	0	0.00	88	0.34
Utilities - Petroleum Pipeline	Other Material Handling Equipment	6	10.00	168	0.40
Utilities - Petroleum Pipeline	Pavers	1	10.00	130	0.42
Utilities - Petroleum Pipeline	Paving Equipment	0	0.00	132	0.36
Utilities - Petroleum Pipeline	Plate Compactors	2	10.00	8	0.43
Utilities - Petroleum Pipeline	Pressure Washers	0	0.00	13	0.30
Utilities - Petroleum Pipeline	Pumps	0	0.00	84	0.74
Utilities - Petroleum Pipeline	Rollers	0	0.00	80	0.38
Utilities - Petroleum Pipeline	Rough Terrain Forklifts	0	0.00	100	0.40
Utilities - Petroleum Pipeline	Rubber Tired Dozers	2	10.00	247	0.40

Utilities - Petroleum Pipeline	Rubber Tired Loaders	0	0.00	203	0.36
Utilities - Petroleum Pipeline	Scrapers	0	0.00	367	0.48
Utilities - Petroleum Pipeline	Signal Boards	0	0.00	6	0.82
Utilities - Petroleum Pipeline	Skid Steer Loaders	0	0.00	65	0.37
Utilities - Petroleum Pipeline	Surfacing Equipment	0	0.00	263	0.30
Utilities - Petroleum Pipeline	Sweepers/Scrubbers	0	0.00	64	0.46
Utilities - Petroleum Pipeline	Tractors/Loaders/Backhoes	2	10.00	97	0.37
Utilities - Petroleum Pipeline	Trenchers	0	0.00	78	0.50
Utilities - Petroleum Pipeline	Welders	6	10.00	46	0.45
Utilities - Transmission Lines (to be scaled)	Aerial Lifts	0	0.00	63	0.31
Utilities - Transmission Lines (to be scaled)	Air Compressors	0	0.00	78	0.48
Utilities - Transmission Lines (to be scaled)	Bore/Drill Rigs	2	8.00	221	0.50
Utilities - Transmission Lines (to be scaled)	Cement and Mortar Mixers	0	0.00	9	0.56
Utilities - Transmission Lines (to be scaled)	Concrete/Industrial Saws	0	0.00	81	0.73
Utilities - Transmission Lines (to be scaled)	Cranes	5	8.00	231	0.29
Utilities - Transmission Lines (to be scaled)	Crawler Tractors	0	0.00	212	0.43
Utilities - Transmission Lines (to be scaled)	Crushing/Proc. Equipment	0	0.00	85	0.78
Utilities - Transmission Lines (to be scaled)	Dumpers/Tenders	2	10.00	16	0.38
Utilities - Transmission Lines (to be scaled)	Excavators	0	0.00	158	0.38
Utilities - Transmission Lines (to be scaled)	Forklifts	0	0.00	89	0.20
Utilities - Transmission Lines (to be scaled)	Generator Sets	0	0.00	84	0.74
Utilities - Transmission Lines (to be scaled)	Graders	4	10.00	187	0.41
Utilities - Transmission Lines (to be scaled)	Off-Highway Tractors	0	0.00	124	0.44
Utilities - Transmission Lines (to be scaled)	Off-Highway Trucks	0	0.00	402	0.38

Utilities - Transmission Lines (to be scaled)	Other Construction Equipment	10	8.00	5000	0.42
Utilities - Transmission Lines (to be scaled)	Other Construction Equipment	5	10.00	172	0.42
Utilities - Transmission Lines (to be scaled)	Other General Industrial Equipment	0	0.00	88	0.34
Utilities - Transmission Lines (to be scaled)	Other Material Handling Equipment	0	0.00	168	0.40
Utilities - Transmission Lines (to be scaled)	Pavers	0	0.00	130	0.42
Utilities - Transmission Lines (to be scaled)	Paving Equipment	0	0.00	132	0.36
Utilities - Transmission Lines (to be scaled)	Plate Compactors	0	0.00	8	0.43
Utilities - Transmission Lines (to be scaled)	Pressure Washers	0	0.00	13	0.30
Utilities - Transmission Lines (to be scaled)	Pumps	0	0.00	84	0.74
Utilities - Transmission Lines (to be scaled)	Rollers	0	0.00	80	0.38
Utilities - Transmission Lines (to be scaled)	Rough Terrain Forklifts	0	0.00	100	0.40
Utilities - Transmission Lines (to be scaled)	Rubber Tired Dozers	2	10.00	247	0.40
Utilities - Transmission Lines (to be scaled)	Rubber Tired Loaders	0	0.00	203	0.36
Utilities - Transmission Lines (to be scaled)	Scrapers	0	0.00	367	0.48
Utilities - Transmission Lines (to be scaled)	Signal Boards	0	0.00	6	0.82
Utilities - Transmission Lines (to be scaled)	Skid Steer Loaders	0	0.00	65	0.37
Utilities - Transmission Lines (to be scaled)	Surfacing Equipment	0	0.00	263	0.30
Utilities - Transmission Lines (to be scaled)	Sweepers/Scrubbers	0	0.00	64	0.46
Utilities - Transmission Lines (to be scaled)	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Utilities - Transmission Lines (to be scaled)	Trenchers	0	0.00	78	0.50
Utilities - Transmission Lines (to be scaled)	Welders	0	0.00	46	0.45
Transmission Lines PTs	Aerial Lifts	0	0.00	63	0.31

Transmission Lines PTs	Air Compressors	0	0.00	78	0.48
Transmission Lines PTs	Bore/Drill Rigs	0	0.00	221	0.50
Transmission Lines PTs	Cement and Mortar Mixers	0	0.00	9	0.56
Transmission Lines PTs	Concrete/Industrial Saws	0	0.00	81	0.73
Transmission Lines PTs	Cranes	0	0.00	231	0.29
Transmission Lines PTs	Crawler Tractors	0	0.00	212	0.43
Transmission Lines PTs	Crushing/Proc. Equipment	0	0.00	85	0.78
Transmission Lines PTs	Dumpers/Tenders	0	0.00	16	0.38
Transmission Lines PTs	Excavators	0	0.00	158	0.38
Transmission Lines PTs	Forklifts	0	0.00	89	0.20
Transmission Lines PTs	Generator Sets	0	0.00	84	0.74
Transmission Lines PTs	Graders	0	0.00	187	0.41
Transmission Lines PTs	Off-Highway Tractors	0	0.00	124	0.44
Transmission Lines PTs	Off-Highway Trucks	0	0.00	402	0.38
Transmission Lines PTs	Other Construction Equipment	10	4.00	172	0.42
Transmission Lines PTs	Other General Industrial Equipment	0	0.00	88	0.34
Transmission Lines PTs	Other Material Handling Equipment	0	0.00	168	0.40
Transmission Lines PTs	Pavers	0	0.00	130	0.42
Transmission Lines PTs	Paving Equipment	0	0.00	132	0.36
Transmission Lines PTs	Plate Compactors	0	0.00	8	0.43
Transmission Lines PTs	Pressure Washers	0	0.00	13	0.30
Transmission Lines PTs	Pumps	0	0.00	84	0.74
Transmission Lines PTs	Rollers	0	0.00	80	0.38
Transmission Lines PTs	Rough Terrain Forklifts	0	0.00	100	0.40
Transmission Lines PTs	Rubber Tired Dozers	0	0.00	247	0.40
Transmission Lines PTs	Rubber Tired Loaders	0	0.00	203	0.36
Transmission Lines PTs	Scrapers	0	0.00	367	0.48

Transmission Lines PTs	Signal Boards	0	0.00	6	0.82
Transmission Lines PTs	Skid Steer Loaders	0	0.00	65	0.37
Transmission Lines PTs	Surfacing Equipment	0	0.00	263	0.30
Transmission Lines PTs	Sweepers/Scrubbers	0	0.00	64	0.46
Transmission Lines PTs	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Transmission Lines PTs	Trenchers	0	0.00	78	0.50
Transmission Lines PTs	Welders	0	0.00	46	0.45
Roadway - Excavation	Aerial Lifts	0	0.00	63	0.31
Roadway - Excavation	Air Compressors	0	0.00	78	0.48
Roadway - Excavation	Bore/Drill Rigs	0	0.00	221	0.50
Roadway - Excavation	Cement and Mortar Mixers	0	0.00	9	0.56
Roadway - Excavation	Concrete/Industrial Saws	0	0.00	81	0.73
Roadway - Excavation	Cranes	0	0.00	231	0.29
Roadway - Excavation	Crawler Tractors	0	0.00	212	0.43
Roadway - Excavation	Crushing/Proc. Equipment	0	0.00	85	0.78
Roadway - Excavation	Dumpers/Tenders	8	10.00	16	0.38
Roadway - Excavation	Excavators	8	10.00	158	0.38
Roadway - Excavation	Forklifts	0	0.00	89	0.20
Roadway - Excavation	Generator Sets	0	0.00	84	0.74
Roadway - Excavation	Graders	0	0.00	187	0.41
Roadway - Excavation	Off-Highway Tractors	0	0.00	124	0.44
Roadway - Excavation	Off-Highway Trucks	8	10.00	402	0.38
Roadway - Excavation	Other Construction Equipment	0	0.00	172	0.42
Roadway - Excavation	Other General Industrial Equipment	0	0.00	88	0.34
Roadway - Excavation	Other Material Handling Equipment	0	0.00	168	0.40
Roadway - Excavation	Pavers	0	0.00	130	0.42
Roadway - Excavation	Paving Equipment	0	0.00	132	0.36

Roadway - Excavation	Plate Compactors	0	0.00	8	0.43
Roadway - Excavation	Pressure Washers	0	0.00	13	0.30
Roadway - Excavation	Pumps	0	0.00	84	0.74
Roadway - Excavation	Rollers	0	0.00	80	0.38
Roadway - Excavation	Rough Terrain Forklifts	0	0.00	100	0.40
Roadway - Excavation	Rubber Tired Dozers	8	10.00	247	0.40
Roadway - Excavation	Rubber Tired Loaders	0	0.00	203	0.36
Roadway - Excavation	Scrapers	4	10.00	367	0.48
Roadway - Excavation	Signal Boards	0	0.00	6	0.82
Roadway - Excavation	Skid Steer Loaders	0	0.00	65	0.37
Roadway - Excavation	Surfacing Equipment	0	0.00	263	0.30
Roadway - Excavation	Sweepers/Scrubbers	0	0.00	64	0.46
Roadway - Excavation	Tractors/Loaders/Backhoes	6	5.00	97	0.37
Roadway - Excavation	Trenchers	0	0.00	78	0.50
Roadway - Excavation	Welders	0	0.00	46	0.45
Roadway - Grading and Paving	Aerial Lifts	0	0.00	63	0.31
Roadway - Grading and Paving	Air Compressors	0	0.00	78	0.48
Roadway - Grading and Paving	Bore/Drill Rigs	0	0.00	221	0.50
Roadway - Grading and Paving	Cement and Mortar Mixers	0	0.00	9	0.56
Roadway - Grading and Paving	Concrete/Industrial Saws	0	0.00	81	0.73
Roadway - Grading and Paving	Cranes	1	20.00	231	0.29
Roadway - Grading and Paving	Crawler Tractors	0	0.00	212	0.43
Roadway - Grading and Paving	Crushing/Proc. Equipment	0	0.00	85	0.78
Roadway - Grading and Paving	Dumpers/Tenders	0	0.00	16	0.38
Roadway - Grading and Paving	Excavators	0	0.00	158	0.38
Roadway - Grading and Paving	Forklifts	0	0.00	89	0.20
Roadway - Grading and Paving	Generator Sets	0	0.00	84	0.74

Roadway - Grading and Paving	Graders	2	20.00	187	0.41
Roadway - Grading and Paving	Off-Highway Tractors	0	0.00	124	0.44
Roadway - Grading and Paving	Off-Highway Trucks	0	0.00	402	0.38
Roadway - Grading and Paving	Other Construction Equipment	0	0.00	172	0.42
Roadway - Grading and Paving	Other General Industrial Equipment	0	0.00	88	0.34
Roadway - Grading and Paving	Other Material Handling Equipment	0	0.00	168	0.40
Roadway - Grading and Paving	Pavers	1	20.00	130	0.42
Roadway - Grading and Paving	Paving Equipment	0	0.00	132	0.36
Roadway - Grading and Paving	Plate Compactors	0	0.00	8	0.43
Roadway - Grading and Paving	Pressure Washers	0	0.00	13	0.30
Roadway - Grading and Paving	Pumps	0	0.00	84	0.74
Roadway - Grading and Paving	Rollers	4	20.00	80	0.38
Roadway - Grading and Paving	Rough Terrain Forklifts	0	0.00	100	0.40
Roadway - Grading and Paving	Rubber Tired Dozers	0	0.00	247	0.40
Roadway - Grading and Paving	Rubber Tired Loaders	0	0.00	203	0.36
Roadway - Grading and Paving	Scrapers	0	0.00	367	0.48
Roadway - Grading and Paving	Signal Boards	0	0.00	6	0.82
Roadway - Grading and Paving	Skid Steer Loaders	0	0.00	65	0.37
Roadway - Grading and Paving	Surfacing Equipment	0	0.00	263	0.30
Roadway - Grading and Paving	Sweepers/Scrubbers	0	0.00	64	0.46
Roadway - Grading and Paving	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Roadway - Grading and Paving	Trenchers	0	0.00	78	0.50
Roadway - Grading and Paving	Welders	0	0.00	46	0.45
Dam Facilities - Site Preparation	Aerial Lifts	0	0.00	63	0.31
Dam Facilities - Site Preparation	Air Compressors	0	0.00	78	0.48
Dam Facilities - Site Preparation	Bore/Drill Rigs	0	0.00	221	0.50
Dam Facilities - Site Preparation	Cement and Mortar Mixers	0	0.00	9	0.56

Dam Facilities - Site Preparation	Concrete/Industrial Saws	0	0.00	81	0.73
Dam Facilities - Site Preparation	Cranes	0	0.00	231	0.29
Dam Facilities - Site Preparation	Crawler Tractors	0	0.00	212	0.43
Dam Facilities - Site Preparation	Crushing/Proc. Equipment	0	0.00	85	0.78
Dam Facilities - Site Preparation	Dumpers/Tenders	1	20.00	16	0.38
Dam Facilities - Site Preparation	Excavators	0	0.00	158	0.38
Dam Facilities - Site Preparation	Forklifts	0	0.00	89	0.20
Dam Facilities - Site Preparation	Generator Sets	0	0.00	84	0.74
Dam Facilities - Site Preparation	Graders	1	20.00	187	0.41
Dam Facilities - Site Preparation	Off-Highway Tractors	0	0.00	124	0.44
Dam Facilities - Site Preparation	Off-Highway Trucks	3	20.00	402	0.38
Dam Facilities - Site Preparation	Other Construction Equipment	1	20.00	172	0.42
Dam Facilities - Site Preparation	Other General Industrial Equipment	0	0.00	88	0.34
Dam Facilities - Site Preparation	Other Material Handling Equipment	0	0.00	168	0.40
Dam Facilities - Site Preparation	Pavers	0	0.00	130	0.42
Dam Facilities - Site Preparation	Paving Equipment	0	0.00	132	0.36
Dam Facilities - Site Preparation	Plate Compactors	1	20.00	8	0.43
Dam Facilities - Site Preparation	Pressure Washers	0	0.00	13	0.30
Dam Facilities - Site Preparation	Pumps	0	0.00	84	0.74
Dam Facilities - Site Preparation	Rollers	0	0.00	80	0.38
Dam Facilities - Site Preparation	Rough Terrain Forklifts	0	0.00	100	0.40
Dam Facilities - Site Preparation	Rubber Tired Dozers	3	20.00	247	0.40
Dam Facilities - Site Preparation	Rubber Tired Loaders	0	0.00	203	0.36
Dam Facilities - Site Preparation	Scrapers	1	20.00	367	0.48
Dam Facilities - Site Preparation	Signal Boards	0	0.00	6	0.82
Dam Facilities - Site Preparation	Skid Steer Loaders	0	0.00	65	0.37
Dam Facilities - Site Preparation	Surfacing Equipment	0	0.00	263	0.30

Dam Facilities - Site Preparation	Sweepers/Scrubbers	0	0.00	64	0.46
Dam Facilities - Site Preparation	Tractors/Loaders/Backhoes	2	20.00	97	0.37
Dam Facilities - Site Preparation	Trenchers	0	0.00	78	0.50
Dam Facilities - Site Preparation	Welders	0	0.00	46	0.45
Pumping Plant	Aerial Lifts	0	0.00	63	0.31
Pumping Plant	Air Compressors	0	0.00	78	0.48
Pumping Plant	Bore/Drill Rigs	0	0.00	221	0.50
Pumping Plant	Cement and Mortar Mixers	0	0.00	9	0.56
Pumping Plant	Concrete/Industrial Saws	0	0.00	81	0.73
Pumping Plant	Cranes	2	6.00	231	0.29
Pumping Plant	Crawler Tractors	0	0.00	212	0.43
Pumping Plant	Crushing/Proc. Equipment	0	0.00	85	0.78
Pumping Plant	Dumpers/Tenders	8	6.00	16	0.38
Pumping Plant	Excavators	2	6.00	158	0.38
Pumping Plant	Forklifts	0	0.00	89	0.20
Pumping Plant	Generator Sets	0	0.00	84	0.74
Pumping Plant	Graders	2	6.00	187	0.41
Pumping Plant	Off-Highway Tractors	0	0.00	124	0.44
Pumping Plant	Off-Highway Trucks	6	6.00	402	0.38
Pumping Plant	Other Construction Equipment	0	0.00	172	0.42
Pumping Plant	Other General Industrial Equipment	0	0.00	88	0.34
Pumping Plant	Other Material Handling Equipment	0	0.00	168	0.40
Pumping Plant	Pavers	1	6.00	130	0.42
Pumping Plant	Paving Equipment	0	0.00	132	0.36
Pumping Plant	Plate Compactors	0	0.00	8	0.43
Pumping Plant	Pressure Washers	0	0.00	13	0.30
Pumping Plant	Pumps	0	0.00	84	0.74

Pumping Plant	Rollers	4	6.00	80	0.38
Pumping Plant	Rough Terrain Forklifts	0	0.00	100	0.40
Pumping Plant	Rubber Tired Dozers	2	6.00	247	0.40
Pumping Plant	Rubber Tired Loaders	0	0.00	203	0.36
Pumping Plant	Scrapers	0	0.00	367	0.48
Pumping Plant	Signal Boards	0	0.00	6	0.82
Pumping Plant	Skid Steer Loaders	0	0.00	65	0.37
Pumping Plant	Surfacing Equipment	0	0.00	263	0.30
Pumping Plant	Sweepers/Scrubbers	0	0.00	64	0.46
Pumping Plant	Tractors/Loaders/Backhoes	4	5.00	97	0.37
Pumping Plant	Trenchers	0	0.00	78	0.50
Pumping Plant	Welders	0	0.00	46	0.45
Tunneling - Outlet and Conveyance	Aerial Lifts	0	0.00	63	0.31
Tunneling - Outlet and Conveyance	Air Compressors	0	0.00	78	0.48
Tunneling - Outlet and Conveyance	Bore/Drill Rigs	1	10.00	221	0.50
Tunneling - Outlet and Conveyance	Cement and Mortar Mixers	0	0.00	9	0.56
Tunneling - Outlet and Conveyance	Concrete/Industrial Saws	0	0.00	81	0.73
Tunneling - Outlet and Conveyance	Cranes	1	6.00	231	0.29
Tunneling - Outlet and Conveyance	Crawler Tractors	0	0.00	212	0.43
Tunneling - Outlet and Conveyance	Crushing/Proc. Equipment	0	0.00	85	0.78
Tunneling - Outlet and Conveyance	Dumpers/Tenders	7	10.00	16	0.38
Tunneling - Outlet and Conveyance	Excavators	0	0.00	158	0.38
Tunneling - Outlet and Conveyance	Forklifts	0	0.00	89	0.20
Tunneling - Outlet and Conveyance	Generator Sets	0	0.00	84	0.74
Tunneling - Outlet and Conveyance	Graders	0	0.00	187	0.41
Tunneling - Outlet and Conveyance	Off-Highway Tractors	0	0.00	124	0.44
Tunneling - Outlet and Conveyance	Off-Highway Trucks	1	0.00	402	0.38

Tunneling - Outlet and Conveyance	Other Construction Equipment	0	0.00	172	0.42
Tunneling - Outlet and Conveyance	Other General Industrial Equipment	0	0.00	88	0.34
Tunneling - Outlet and Conveyance	Other Material Handling Equipment	0	0.00	168	0.40
Tunneling - Outlet and Conveyance	Pavers	0	0.00	130	0.42
Tunneling - Outlet and Conveyance	Paving Equipment	0	0.00	132	0.36
Tunneling - Outlet and Conveyance	Plate Compactors	0	0.00	8	0.43
Tunneling - Outlet and Conveyance	Pressure Washers	0	0.00	13	0.30
Tunneling - Outlet and Conveyance	Pumps	0	24.00	84	0.74
Tunneling - Outlet and Conveyance	Rollers	0	0.00	80	0.38
Tunneling - Outlet and Conveyance	Rough Terrain Forklifts	0	0.00	100	0.40
Tunneling - Outlet and Conveyance	Rubber Tired Dozers	0	0.00	247	0.40
Tunneling - Outlet and Conveyance	Rubber Tired Loaders	0	0.00	203	0.36
Tunneling - Outlet and Conveyance	Scrapers	0	0.00	367	0.48
Tunneling - Outlet and Conveyance	Signal Boards	0	0.00	6	0.82
Tunneling - Outlet and Conveyance	Skid Steer Loaders	0	0.00	65	0.37
Tunneling - Outlet and Conveyance	Surfacing Equipment	0	0.00	263	0.30
Tunneling - Outlet and Conveyance	Sweepers/Scrubbers	0	0.00	64	0.46
Tunneling - Outlet and Conveyance	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Tunneling - Outlet and Conveyance	Trenchers	0	0.00	78	0.50
Tunneling - Outlet and Conveyance	Welders	0	0.00	46	0.45
Dam Facilities - Saddle Dams	Aerial Lifts	0	0.00	63	0.31
Dam Facilities - Saddle Dams	Air Compressors	0	0.00	78	0.48
Dam Facilities - Saddle Dams	Bore/Drill Rigs	0	0.00	221	0.50
Dam Facilities - Saddle Dams	Cement and Mortar Mixers	0	0.00	9	0.56
Dam Facilities - Saddle Dams	Concrete/Industrial Saws	0	0.00	81	0.73
Dam Facilities - Saddle Dams	Cranes	0	0.00	231	0.29
Dam Facilities - Saddle Dams	Crawler Tractors	0	0.00	212	0.43

Dam Facilities - Saddle Dams	Crushing/Proc. Equipment	0	0.00	85	0.78
Dam Facilities - Saddle Dams	Dumpers/Tenders	10	20.00	16	0.38
Dam Facilities - Saddle Dams	Excavators	1	20.00	158	0.38
Dam Facilities - Saddle Dams	Forklifts	0	0.00	89	0.20
Dam Facilities - Saddle Dams	Generator Sets	0	0.00	84	0.74
Dam Facilities - Saddle Dams	Graders	0	0.00	187	0.41
Dam Facilities - Saddle Dams	Off-Highway Tractors	0	0.00	124	0.44
Dam Facilities - Saddle Dams	Off-Highway Trucks	9	20.00	402	0.38
Dam Facilities - Saddle Dams	Other Construction Equipment	3	20.00	172	0.42
Dam Facilities - Saddle Dams	Other General Industrial Equipment	0	0.00	88	0.34
Dam Facilities - Saddle Dams	Other Material Handling Equipment	0	0.00	168	0.40
Dam Facilities - Saddle Dams	Pavers	0	0.00	130	0.42
Dam Facilities - Saddle Dams	Paving Equipment	0	0.00	132	0.36
Dam Facilities - Saddle Dams	Plate Compactors	0	0.00	8	0.43
Dam Facilities - Saddle Dams	Pressure Washers	0	0.00	13	0.30
Dam Facilities - Saddle Dams	Pumps	0	0.00	84	0.74
Dam Facilities - Saddle Dams	Rollers	0	0.00	80	0.38
Dam Facilities - Saddle Dams	Rough Terrain Forklifts	0	0.00	100	0.40
Dam Facilities - Saddle Dams	Rubber Tired Dozers	0	0.00	247	0.40
Dam Facilities - Saddle Dams	Rubber Tired Loaders	0	0.00	203	0.36
Dam Facilities - Saddle Dams	Scrapers	0	0.00	367	0.48
Dam Facilities - Saddle Dams	Signal Boards	0	0.00	6	0.82
Dam Facilities - Saddle Dams	Skid Steer Loaders	0	0.00	65	0.37
Dam Facilities - Saddle Dams	Surfacing Equipment	0	0.00	263	0.30
Dam Facilities - Saddle Dams	Sweepers/Scrubbers	0	0.00	64	0.46
Dam Facilities - Saddle Dams	Tractors/Loaders/Backhoes	8	20.00	97	0.37
Dam Facilities - Saddle Dams	Trenchers	0	0.00	78	0.50

Dam Facilities - Saddle Dams	Welders	0	0.00	46	0.45
Dam Facilities - Main Dam	Aerial Lifts	0	0.00	63	0.31
Dam Facilities - Main Dam	Air Compressors	0	0.00	78	0.48
Dam Facilities - Main Dam	Bore/Drill Rigs	0	0.00	221	0.50
Dam Facilities - Main Dam	Cement and Mortar Mixers	0	0.00	9	0.56
Dam Facilities - Main Dam	Concrete/Industrial Saws	0	0.00	81	0.73
Dam Facilities - Main Dam	Cranes	0	0.00	231	0.29
Dam Facilities - Main Dam	Crawler Tractors	0	0.00	212	0.43
Dam Facilities - Main Dam	Crushing/Proc. Equipment	0	0.00	85	0.78
Dam Facilities - Main Dam	Dumpers/Tenders	4	20.00	16	0.38
Dam Facilities - Main Dam	Excavators	1	20.00	158	0.38
Dam Facilities - Main Dam	Forklifts	0	0.00	89	0.20
Dam Facilities - Main Dam	Generator Sets	0	0.00	84	0.74
Dam Facilities - Main Dam	Graders	0	0.00	187	0.41
Dam Facilities - Main Dam	Off-Highway Tractors	0	0.00	124	0.44
Dam Facilities - Main Dam	Off-Highway Trucks	9	20.00	402	0.38
Dam Facilities - Main Dam	Other Construction Equipment	3	20.00	172	0.42
Dam Facilities - Main Dam	Other General Industrial Equipment	0	0.00	88	0.34
Dam Facilities - Main Dam	Other Material Handling Equipment	0	0.00	168	0.40
Dam Facilities - Main Dam	Pavers	0	0.00	130	0.42
Dam Facilities - Main Dam	Paving Equipment	0	0.00	132	0.36
Dam Facilities - Main Dam	Plate Compactors	6	20.00	8	0.43
Dam Facilities - Main Dam	Pressure Washers	0	0.00	13	0.30
Dam Facilities - Main Dam	Pumps	0	0.00	84	0.74
Dam Facilities - Main Dam	Rollers	0	0.00	80	0.38
Dam Facilities - Main Dam	Rough Terrain Forklifts	0	0.00	100	0.40
Dam Facilities - Main Dam	Rubber Tired Dozers	6	20.00	247	0.40

Dam Facilities - Main Dam	Rubber Tired Loaders	0	0.00	203	0.36
Dam Facilities - Main Dam	Scrapers	6	20.00	367	0.48
Dam Facilities - Main Dam	Signal Boards	0	0.00	6	0.82
Dam Facilities - Main Dam	Skid Steer Loaders	0	0.00	65	0.37
Dam Facilities - Main Dam	Surfacing Equipment	0	0.00	263	0.30
Dam Facilities - Main Dam	Sweepers/Scrubbers	0	0.00	64	0.46
Dam Facilities - Main Dam	Tractors/Loaders/Backhoes	2	20.00	97	0.37
Dam Facilities - Main Dam	Trenchers	0	0.00	78	0.50
Dam Facilities - Main Dam	Welders	0	0.00	46	0.45
Dam Facilities - Outlet Works	Aerial Lifts	0	0.00	63	0.31
Dam Facilities - Outlet Works	Air Compressors	0	0.00	78	0.48
Dam Facilities - Outlet Works	Bore/Drill Rigs	0	0.00	221	0.50
Dam Facilities - Outlet Works	Cement and Mortar Mixers	0	0.00	9	0.56
Dam Facilities - Outlet Works	Concrete/Industrial Saws	0	0.00	81	0.73
Dam Facilities - Outlet Works	Cranes	0	0.00	231	0.29
Dam Facilities - Outlet Works	Crawler Tractors	0	0.00	212	0.43
Dam Facilities - Outlet Works	Crushing/Proc. Equipment	0	0.00	85	0.78
Dam Facilities - Outlet Works	Dumpers/Tenders	2	20.00	16	0.38
Dam Facilities - Outlet Works	Excavators	0	0.00	158	0.38
Dam Facilities - Outlet Works	Forklifts	0	0.00	89	0.20
Dam Facilities - Outlet Works	Generator Sets	0	0.00	84	0.74
Dam Facilities - Outlet Works	Graders	0	0.00	187	0.41
Dam Facilities - Outlet Works	Off-Highway Tractors	0	0.00	124	0.44
Dam Facilities - Outlet Works	Off-Highway Trucks	0	0.00	402	0.38
Dam Facilities - Outlet Works	Other Construction Equipment	0	0.00	172	0.42
Dam Facilities - Outlet Works	Other General Industrial Equipment	0	0.00	88	0.34
Dam Facilities - Outlet Works	Other Material Handling Equipment	0	0.00	168	0.40

Dam Facilities - Outlet Works	Pavers	0	0.00	130	0.42
Dam Facilities - Outlet Works	Paving Equipment	0	0.00	132	0.36
Dam Facilities - Outlet Works	Plate Compactors	0	0.00	8	0.43
Dam Facilities - Outlet Works	Pressure Washers	0	0.00	13	0.30
Dam Facilities - Outlet Works	Pumps	0	0.00	84	0.74
Dam Facilities - Outlet Works	Rollers	0	0.00	80	0.38
Dam Facilities - Outlet Works	Rough Terrain Forklifts	0	0.00	100	0.40
Dam Facilities - Outlet Works	Rubber Tired Dozers	0	0.00	247	0.40
Dam Facilities - Outlet Works	Rubber Tired Loaders	0	0.00	203	0.36
Dam Facilities - Outlet Works	Scrapers	0	0.00	367	0.48
Dam Facilities - Outlet Works	Signal Boards	0	0.00	6	0.82
Dam Facilities - Outlet Works	Skid Steer Loaders	0	0.00	65	0.37
Dam Facilities - Outlet Works	Surfacing Equipment	0	0.00	263	0.30
Dam Facilities - Outlet Works	Sweepers/Scrubbers	0	0.00	64	0.46
Dam Facilities - Outlet Works	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Dam Facilities - Outlet Works	Trenchers	0	0.00	78	0.50
Dam Facilities - Outlet Works	Welders	0	0.00	46	0.45
Outlet Works PTs	Aerial Lifts	0	0.00	63	0.31
Outlet Works PTs	Air Compressors	0	0.00	78	0.48
Outlet Works PTs	Bore/Drill Rigs	0	0.00	221	0.50
Outlet Works PTs	Cement and Mortar Mixers	0	0.00	9	0.56
Outlet Works PTs	Concrete/Industrial Saws	0	0.00	81	0.73
Outlet Works PTs	Cranes	0	0.00	231	0.29
Outlet Works PTs	Crawler Tractors	0	0.00	212	0.43
Outlet Works PTs	Crushing/Proc. Equipment	0	0.00	85	0.78
Outlet Works PTs	Dumpers/Tenders	0	0.00	16	0.38
Outlet Works PTs	Excavators	0	0.00	158	0.38

Outlet Works PTs	Forklifts	0	0.00	89	0.20
Outlet Works PTs	Generator Sets	0	0.00	84	0.74
Outlet Works PTs	Graders	0	0.00	187	0.41
Outlet Works PTs	Off-Highway Tractors	0	0.00	124	0.44
Outlet Works PTs	Off-Highway Trucks	0	0.00	402	0.38
Outlet Works PTs	Other Construction Equipment	2	5.00	172	0.42
Outlet Works PTs	Other General Industrial Equipment	0	0.00	88	0.34
Outlet Works PTs	Other Material Handling Equipment	0	0.00	168	0.40
Outlet Works PTs	Pavers	0	0.00	130	0.42
Outlet Works PTs	Paving Equipment	0	0.00	132	0.36
Outlet Works PTs	Plate Compactors	0	0.00	8	0.43
Outlet Works PTs	Pressure Washers	0	0.00	13	0.30
Outlet Works PTs	Pumps	0	0.00	84	0.74
Outlet Works PTs	Rollers	0	0.00	80	0.38
Outlet Works PTs	Rough Terrain Forklifts	0	0.00	100	0.40
Outlet Works PTs	Rubber Tired Dozers	0	0.00	247	0.40
Outlet Works PTs	Rubber Tired Loaders	0	0.00	203	0.36
Outlet Works PTs	Scrapers	0	0.00	367	0.48
Outlet Works PTs	Signal Boards	0	0.00	6	0.82
Outlet Works PTs	Skid Steer Loaders	0	0.00	65	0.37
Outlet Works PTs	Surfacing Equipment	0	0.00	263	0.30
Outlet Works PTs	Sweepers/Scrubbers	0	0.00	64	0.46
Outlet Works PTs	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Outlet Works PTs	Trenchers	0	0.00	78	0.50
Outlet Works PTs	Welders	0	0.00	46	0.45
Dam Facilities - Spillway	Aerial Lifts	0	0.00	63	0.31
Dam Facilities - Spillway	Air Compressors	0	0.00	78	0.48

Dam Facilities - Spillway	Bore/Drill Rigs	0	0.00	221	0.50
Dam Facilities - Spillway	Cement and Mortar Mixers	0	0.00	9	0.56
Dam Facilities - Spillway	Concrete/Industrial Saws	0	0.00	81	0.73
Dam Facilities - Spillway	Cranes	0	0.00	231	0.29
Dam Facilities - Spillway	Crawler Tractors	0	0.00	212	0.43
Dam Facilities - Spillway	Crushing/Proc. Equipment	0	0.00	85	0.78
Dam Facilities - Spillway	Dumpers/Tenders	1	20.00	16	0.38
Dam Facilities - Spillway	Excavators	2	20.00	158	0.38
Dam Facilities - Spillway	Forklifts	0	0.00	89	0.20
Dam Facilities - Spillway	Generator Sets	0	0.00	84	0.74
Dam Facilities - Spillway	Graders	0	0.00	187	0.41
Dam Facilities - Spillway	Off-Highway Tractors	0	0.00	124	0.44
Dam Facilities - Spillway	Off-Highway Trucks	0	0.00	402	0.38
Dam Facilities - Spillway	Other Construction Equipment	0	0.00	172	0.42
Dam Facilities - Spillway	Other General Industrial Equipment	0	0.00	88	0.34
Dam Facilities - Spillway	Other Material Handling Equipment	0	0.00	168	0.40
Dam Facilities - Spillway	Pavers	0	0.00	130	0.42
Dam Facilities - Spillway	Paving Equipment	0	0.00	132	0.36
Dam Facilities - Spillway	Plate Compactors	0	0.00	8	0.43
Dam Facilities - Spillway	Pressure Washers	0	0.00	13	0.30
Dam Facilities - Spillway	Pumps	0	0.00	84	0.74
Dam Facilities - Spillway	Rollers	0	0.00	80	0.38
Dam Facilities - Spillway	Rough Terrain Forklifts	0	0.00	100	0.40
Dam Facilities - Spillway	Rubber Tired Dozers	0	0.00	247	0.40
Dam Facilities - Spillway	Rubber Tired Loaders	0	0.00	203	0.36
Dam Facilities - Spillway	Scrapers	0	0.00	367	0.48
Dam Facilities - Spillway	Signal Boards	0	0.00	6	0.82

Dam Facilities - Spillway	Skid Steer Loaders	0	0.00	65	0.37
Dam Facilities - Spillway	Surfacing Equipment	0	0.00	263	0.30
Dam Facilities - Spillway	Sweepers/Scrubbers	0	0.00	64	0.46
Dam Facilities - Spillway	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Dam Facilities - Spillway	Trenchers	0	0.00	78	0.50
Dam Facilities - Spillway	Welders	0	0.00	46	0.45
Conveyance - Open Cut Trench	Aerial Lifts	0	0.00	63	0.31
Conveyance - Open Cut Trench	Air Compressors	0	0.00	78	0.48
Conveyance - Open Cut Trench	Bore/Drill Rigs	0	0.00	221	0.50
Conveyance - Open Cut Trench	Cement and Mortar Mixers	0	0.00	9	0.56
Conveyance - Open Cut Trench	Concrete/Industrial Saws	0	0.00	81	0.73
Conveyance - Open Cut Trench	Cranes	1	6.00	231	0.29
Conveyance - Open Cut Trench	Crawler Tractors	0	0.00	212	0.43
Conveyance - Open Cut Trench	Crushing/Proc. Equipment	0	0.00	85	0.78
Conveyance - Open Cut Trench	Dumpers/Tenders	14	10.00	16	0.38
Conveyance - Open Cut Trench	Excavators	2	10.00	158	0.38
Conveyance - Open Cut Trench	Forklifts	0	0.00	89	0.20
Conveyance - Open Cut Trench	Generator Sets	0	0.00	84	0.74
Conveyance - Open Cut Trench	Graders	0	0.00	187	0.41
Conveyance - Open Cut Trench	Off-Highway Tractors	0	0.00	124	0.44
Conveyance - Open Cut Trench	Off-Highway Trucks	1	10.00	402	0.38
Conveyance - Open Cut Trench	Other Construction Equipment	0	0.00	172	0.42
Conveyance - Open Cut Trench	Other General Industrial Equipment	0	0.00	88	0.34
Conveyance - Open Cut Trench	Other Material Handling Equipment	0	0.00	168	0.40
Conveyance - Open Cut Trench	Pavers	0	0.00	130	0.42
Conveyance - Open Cut Trench	Paving Equipment	0	0.00	132	0.36
Conveyance - Open Cut Trench	Plate Compactors	0	0.00	8	0.43

Conveyance - Open Cut Trench	Pressure Washers	0	0.00	13	0.30
Conveyance - Open Cut Trench	Pumps	1	24.00	84	0.74
Conveyance - Open Cut Trench	Rollers	0	0.00	80	0.38
Conveyance - Open Cut Trench	Rough Terrain Forklifts	0	0.00	100	0.40
Conveyance - Open Cut Trench	Rubber Tired Dozers	1	4.00	247	0.40
Conveyance - Open Cut Trench	Rubber Tired Loaders	0	0.00	203	0.36
Conveyance - Open Cut Trench	Scrapers	0	0.00	367	0.48
Conveyance - Open Cut Trench	Signal Boards	0	0.00	6	0.82
Conveyance - Open Cut Trench	Skid Steer Loaders	0	0.00	65	0.37
Conveyance - Open Cut Trench	Surfacing Equipment	0	0.00	263	0.30
Conveyance - Open Cut Trench	Sweepers/Scrubbers	0	0.00	64	0.46
Conveyance - Open Cut Trench	Tractors/Loaders/Backhoes	2	10.00	97	0.37
Conveyance - Open Cut Trench	Trenchers	0	0.00	78	0.50
Conveyance - Open Cut Trench	Welders	0	0.00	46	0.45
Open Cut Trench PTs	Aerial Lifts	0	0.00	63	0.31
Open Cut Trench PTs	Air Compressors	0	0.00	78	0.48
Open Cut Trench PTs	Bore/Drill Rigs	0	0.00	221	0.50
Open Cut Trench PTs	Cement and Mortar Mixers	0	0.00	9	0.56
Open Cut Trench PTs	Concrete/Industrial Saws	0	0.00	81	0.73
Open Cut Trench PTs	Cranes	0	0.00	231	0.29
Open Cut Trench PTs	Crawler Tractors	0	0.00	212	0.43
Open Cut Trench PTs	Crushing/Proc. Equipment	0	0.00	85	0.78
Open Cut Trench PTs	Dumpers/Tenders	0	0.00	16	0.38
Open Cut Trench PTs	Excavators	0	0.00	158	0.38
Open Cut Trench PTs	Forklifts	0	0.00	89	0.20
Open Cut Trench PTs	Generator Sets	0	0.00	84	0.74
Open Cut Trench PTs	Graders	0	0.00	187	0.41

Open Cut Trench PTs	Off-Highway Tractors	0	0.00	124	0.44
Open Cut Trench PTs	Off-Highway Trucks	0	0.00	402	0.38
Open Cut Trench PTs	Other Construction Equipment	3	5.00	172	0.42
Open Cut Trench PTs	Other General Industrial Equipment	0	0.00	88	0.34
Open Cut Trench PTs	Other Material Handling Equipment	0	0.00	168	0.40
Open Cut Trench PTs	Pavers	0	0.00	130	0.42
Open Cut Trench PTs	Paving Equipment	0	0.00	132	0.36
Open Cut Trench PTs	Plate Compactors	0	0.00	8	0.43
Open Cut Trench PTs	Pressure Washers	0	0.00	13	0.30
Open Cut Trench PTs	Pumps	0	0.00	84	0.74
Open Cut Trench PTs	Rollers	0	0.00	80	0.38
Open Cut Trench PTs	Rough Terrain Forklifts	0	0.00	100	0.40
Open Cut Trench PTs	Rubber Tired Dozers	0	0.00	247	0.40
Open Cut Trench PTs	Rubber Tired Loaders	0	0.00	203	0.36
Open Cut Trench PTs	Scrapers	0	0.00	367	0.48
Open Cut Trench PTs	Signal Boards	0	0.00	6	0.82
Open Cut Trench PTs	Skid Steer Loaders	0	0.00	65	0.37
Open Cut Trench PTs	Surfacing Equipment	0	0.00	263	0.30
Open Cut Trench PTs	Sweepers/Scrubbers	0	0.00	64	0.46
Open Cut Trench PTs	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Open Cut Trench PTs	Trenchers	0	0.00	78	0.50
Open Cut Trench PTs	Welders	0	0.00	46	0.45
Dam Facilities - Site Restoration	Aerial Lifts	0	0.00	63	0.31
Dam Facilities - Site Restoration	Air Compressors	0	0.00	78	0.48
Dam Facilities - Site Restoration	Bore/Drill Rigs	0	0.00	221	0.50
Dam Facilities - Site Restoration	Cement and Mortar Mixers	0	0.00	9	0.56
Dam Facilities - Site Restoration	Concrete/Industrial Saws	0	0.00	81	0.73

Dam Facilities - Site Restoration	Cranes	0	0.00	231	0.29
Dam Facilities - Site Restoration	Crawler Tractors	0	0.00	212	0.43
Dam Facilities - Site Restoration	Crushing/Proc. Equipment	0	0.00	85	0.78
Dam Facilities - Site Restoration	Dumpers/Tenders	4	20.00	16	0.38
Dam Facilities - Site Restoration	Excavators	0	0.00	158	0.38
Dam Facilities - Site Restoration	Forklifts	0	0.00	89	0.20
Dam Facilities - Site Restoration	Generator Sets	0	0.00	84	0.74
Dam Facilities - Site Restoration	Graders	2	20.00	187	0.41
Dam Facilities - Site Restoration	Off-Highway Tractors	0	0.00	124	0.44
Dam Facilities - Site Restoration	Off-Highway Trucks	0	0.00	402	0.38
Dam Facilities - Site Restoration	Other Construction Equipment	0	0.00	172	0.42
Dam Facilities - Site Restoration	Other General Industrial Equipment	0	0.00	88	0.34
Dam Facilities - Site Restoration	Other Material Handling Equipment	0	0.00	168	0.40
Dam Facilities - Site Restoration	Pavers	0	0.00	130	0.42
Dam Facilities - Site Restoration	Paving Equipment	0	0.00	132	0.36
Dam Facilities - Site Restoration	Plate Compactors	1	20.00	8	0.43
Dam Facilities - Site Restoration	Pressure Washers	0	0.00	13	0.30
Dam Facilities - Site Restoration	Pumps	0	0.00	84	0.74
Dam Facilities - Site Restoration	Rollers	0	0.00	80	0.38
Dam Facilities - Site Restoration	Rough Terrain Forklifts	0	0.00	100	0.40
Dam Facilities - Site Restoration	Rubber Tired Dozers	0	0.00	247	0.40
Dam Facilities - Site Restoration	Rubber Tired Loaders	0	0.00	203	0.36
Dam Facilities - Site Restoration	Scrapers	0	0.00	367	0.48
Dam Facilities - Site Restoration	Signal Boards	0	0.00	6	0.82
Dam Facilities - Site Restoration	Skid Steer Loaders	0	0.00	65	0.37
Dam Facilities - Site Restoration	Surfacing Equipment	0	0.00	263	0.30
Dam Facilities - Site Restoration	Sweepers/Scrubbers	0	0.00	64	0.46

Dam Facilities - Site Restoration	Tractors/Loaders/Backhoes		1	20.00	97	0.37
Dam Facilities - Site Restoration	Trenchers		0	0.00	78	0.50
Dam Facilities - Site Restoration	Welders		0	0.00	46	0.45

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
Utilities - Petroleum Pipeline	29	37.00	3.00	0.00	30.00	75.00	75.00	LD_Mix	HDT_Mix	HHDT
Utilities - Transmission Lines (to be scaled)	30	25.00	6.00	0.00	30.00	75.00	75.00	LD_Mix	HDT_Mix	HHDT
Transmission Lines PTs	10	13.00	0.00	0.00	30.00	75.00	75.00	LD_Mix	HDT_Mix	HHDT
Roadway - Excavation	42	53.00	0.00	7.00	30.00	75.00	75.00	LD_Mix	HDT_Mix	HHDT
Roadway - Grading and Paving	8	10.00	10.00	7.00	30.00	75.00	75.00	LD_Mix	HDT_Mix	HHDT
Dam Facilities - Site Preparation	13	17.00	5.00	4.00	30.00	75.00	75.00	LD_Mix	HDT_Mix	HHDT
Pumping Plant	31	39.00	1.00	6.00	30.00	75.00	75.00	LD_Mix	HDT_Mix	HHDT
Tunneling - Outlet and Conveyance	11	7.00	0.00	0.00	30.00	75.00	75.00	LD_Mix	HDT_Mix	HHDT
Dam Facilities - Saddle Dams	31	39.00	17.00	48.00	30.00	75.00	75.00	LD_Mix	HDT_Mix	HHDT
Dam Facilities - Main Dam	37	47.00	9.00	108.00	30.00	75.00	75.00	LD_Mix	HDT_Mix	HHDT
Dam Facilities - Outlet Works	2	3.00	5.00	3.00	30.00	75.00	75.00	LD_Mix	HDT_Mix	HHDT
Outlet Works PTs	2	3.00	0.00	0.00	30.00	75.00	75.00	LD_Mix	HDT_Mix	HHDT
Dam Facilities - Spillway	3	4.00	3.00	0.00	30.00	75.00	75.00	LD_Mix	HDT_Mix	HHDT
Conveyance - Open Cut Trench	22	8.00	8.00	41.00	30.00	75.00	75.00	LD_Mix	HDT_Mix	HHDT
Open Cut Trench PTs	3	4.00	0.00	0.00	30.00	75.00	75.00	LD_Mix	HDT_Mix	HHDT
Dam Facilities - Site Restoration	8	10.00	2.00	0.00	30.00	75.00	75.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Utilities - Petroleum Pipeline - 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					0.9108	0.0000	0.9108	0.5007	0.0000	0.5007	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.6782	6.0394	6.5323	0.0105		0.3035	0.3035		0.2816	0.2816	0.0000	903.5646	903.5646	0.2738	0.0000	910.4093
Total	**0.6782**	**6.0394**	**6.5323**	**0.0105**	**0.9108**	**0.3035**	**1.2143**	**0.5007**	**0.2816**	**0.7823**	**0.0000**	**903.5646**	**903.5646**	**0.2738**	**0.0000**	**910.4093**

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	3.3800e-003	0.0854	0.0177	4.1000e-004	0.0123	4.4000e-004	0.0128	3.5500e-003	4.2000e-004	3.9800e-003	0.0000	38.7028	38.7028	5.6000e-004	0.0000	38.7169
Worker	0.0183	0.0130	0.1322	4.5000e-004	0.0497	3.1000e-004	0.0500	0.0132	2.8000e-004	0.0135	0.0000	40.7797	40.7797	9.4000e-004	0.0000	40.8031
Total	**0.0217**	**0.0984**	**0.1499**	**8.6000e-004**	**0.0620**	**7.5000e-004**	**0.0627**	**0.0168**	**7.0000e-004**	**0.0175**	**0.0000**	**79.4826**	**79.4826**	**1.5000e-003**	**0.0000**	**79.5200**

3.2 Utilities - Petroleum Pipeline - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4099	0.0000	0.4099	0.2253	0.0000	0.2253	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.6782	6.0394	6.5323	0.0105		0.3035	0.3035		0.2816	0.2816	0.0000	903.5635	903.5635	0.2738	0.0000	910.4082
Total	**0.6782**	**6.0394**	**6.5323**	**0.0105**	**0.4099**	**0.3035**	**0.7133**	**0.2253**	**0.2816**	**0.5069**	**0.0000**	**903.5635**	**903.5635**	**0.2738**	**0.0000**	**910.4082**

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	3.3800e-003	0.0854	0.0177	4.1000e-004	0.0123	4.4000e-004	0.0128	3.5500e-003	4.2000e-004	3.9800e-003	0.0000	38.7028	38.7028	5.6000e-004	0.0000	38.7169
Worker	0.0183	0.0130	0.1322	4.5000e-004	0.0497	3.1000e-004	0.0500	0.0132	2.8000e-004	0.0135	0.0000	40.7797	40.7797	9.4000e-004	0.0000	40.8031
Total	**0.0217**	**0.0984**	**0.1499**	**8.6000e-004**	**0.0620**	**7.5000e-004**	**0.0627**	**0.0168**	**7.0000e-004**	**0.0175**	**0.0000**	**79.4826**	**79.4826**	**1.5000e-003**	**0.0000**	**79.5200**

3.3 Utilities - Transmission Lines (to be scaled) - 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					1.1063	0.0000	1.1063	0.1860	0.0000	0.1860	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0901	0.9873	0.5686	1.4300e-003		0.0418	0.0418		0.0385	0.0385	0.0000	125.0752	125.0752	0.0402	0.0000	126.0790
Total	**0.0901**	**0.9873**	**0.5686**	**1.4300e-003**	**1.1063**	**0.0418**	**1.1481**	**0.1860**	**0.0385**	**0.2245**	**0.0000**	**125.0752**	**125.0752**	**0.0402**	**0.0000**	**126.0790**

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	1.1200e-003	0.0282	5.8600e-003	1.3000e-004	4.0700e-003	1.5000e-004	4.2200e-003	1.1700e-003	1.4000e-004	1.3100e-003	0.0000	12.7943	12.7943	1.9000e-004	0.0000	12.7990
Worker	2.0500e-003	1.4500e-003	0.0148	5.0000e-005	5.5500e-003	3.0000e-005	5.5800e-003	1.4700e-003	3.0000e-005	1.5100e-003	0.0000	4.5544	4.5544	1.0000e-004	0.0000	4.5570
Total	**3.1700e-003**	**0.0297**	**0.0206**	**1.8000e-004**	**9.6200e-003**	**1.8000e-004**	**9.8000e-003**	**2.6400e-003**	**1.7000e-004**	**2.8200e-003**	**0.0000**	**17.3487**	**17.3487**	**2.9000e-004**	**0.0000**	**17.3560**

3.3 Utilities - Transmission Lines (to be scaled) - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4979	0.0000	0.4979	0.0837	0.0000	0.0837	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0901	0.9873	0.5686	1.4300e-003		0.0418	0.0418		0.0385	0.0385	0.0000	125.0750	125.0750	0.0402	0.0000	126.0789
Total	**0.0901**	**0.9873**	**0.5686**	**1.4300e-003**	**0.4979**	**0.0418**	**0.5397**	**0.0837**	**0.0385**	**0.1222**	**0.0000**	**125.0750**	**125.0750**	**0.0402**	**0.0000**	**126.0789**

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	1.1200e-003	0.0282	5.8600e-003	1.3000e-004	4.0700e-003	1.5000e-004	4.2200e-003	1.1700e-003	1.4000e-004	1.3100e-003	0.0000	12.7943	12.7943	1.9000e-004	0.0000	12.7990
Worker	2.0500e-003	1.4500e-003	0.0148	5.0000e-005	5.5500e-003	3.0000e-005	5.5800e-003	1.4700e-003	3.0000e-005	1.5100e-003	0.0000	4.5544	4.5544	1.0000e-004	0.0000	4.5570
Total	**3.1700e-003**	**0.0297**	**0.0206**	**1.8000e-004**	**9.6200e-003**	**1.8000e-004**	**9.8000e-003**	**2.6400e-003**	**1.7000e-004**	**2.8200e-003**	**0.0000**	**17.3487**	**17.3487**	**2.9000e-004**	**0.0000**	**17.3560**

3.3 Utilities - Transmission Lines (to be scaled) - 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					2.9130	0.0000	2.9130	1.1790	0.0000	1.1790	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0631	11.2953	7.1643	0.0186		0.4741	0.4741		0.4366	0.4366	0.0000	1,626.0939	1,626.0939	0.5220	0.0000	1,639.1446
Total	**1.0631**	**11.2953**	**7.1643**	**0.0186**	**2.9130**	**0.4741**	**3.3870**	**1.1790**	**0.4366**	**1.6156**	**0.0000**	**1,626.0939**	**1,626.0939**	**0.5220**	**0.0000**	**1,639.1446**

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	9.9000e-003	0.2360	0.0637	1.7100e-003	0.0529	5.9000e-004	0.0535	0.0153	5.7000e-004	0.0158	0.0000	162.5004	162.5004	1.7400e-003	0.0000	162.5438
Worker	0.0248	0.0169	0.1752	6.3000e-004	0.0721	4.3000e-004	0.0726	0.0192	4.0000e-004	0.0196	0.0000	56.9956	56.9956	1.2100e-003	0.0000	57.0259
Total	**0.0347**	**0.2529**	**0.2390**	**2.3400e-003**	**0.1251**	**1.0200e-003**	**0.1261**	**0.0344**	**9.7000e-004**	**0.0354**	**0.0000**	**219.4960**	**219.4960**	**2.9500e-003**	**0.0000**	**219.5697**

3.3 Utilities - Transmission Lines (to be scaled) - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.3108	0.0000	1.3108	0.5306	0.0000	0.5306	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0631	11.2953	7.1643	0.0186		0.4741	0.4741		0.4366	0.4366	0.0000	1,626.0919	1,626.0919	0.5220	0.0000	1,639.1426
Total	**1.0631**	**11.2953**	**7.1643**	**0.0186**	**1.3108**	**0.4741**	**1.7849**	**0.5306**	**0.4366**	**0.9672**	**0.0000**	**1,626.0919**	**1,626.0919**	**0.5220**	**0.0000**	**1,639.1426**

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	9.9000e-003	0.2360	0.0637	1.7100e-003	0.0529	5.9000e-004	0.0535	0.0153	5.7000e-004	0.0158	0.0000	162.5004	162.5004	1.7400e-003	0.0000	162.5438
Worker	0.0248	0.0169	0.1752	6.3000e-004	0.0721	4.3000e-004	0.0726	0.0192	4.0000e-004	0.0196	0.0000	56.9956	56.9956	1.2100e-003	0.0000	57.0259
Total	**0.0347**	**0.2529**	**0.2390**	**2.3400e-003**	**0.1251**	**1.0200e-003**	**0.1261**	**0.0344**	**9.7000e-004**	**0.0354**	**0.0000**	**219.4960**	**219.4960**	**2.9500e-003**	**0.0000**	**219.5697**

3.3 Utilities - Transmission Lines (to be scaled) - 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					2.9280	0.0000	2.9280	1.1873	0.0000	1.1873	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0282	10.6308	7.1745	0.0187		0.4467	0.4467		0.4114	0.4114	0.0000	1,638.8359	1,638.8359	0.5261	0.0000	1,651.9889
Total	**1.0282**	**10.6308**	**7.1745**	**0.0187**	**2.9280**	**0.4467**	**3.3747**	**1.1873**	**0.4114**	**1.5987**	**0.0000**	**1,638.8359**	**1,638.8359**	**0.5261**	**0.0000**	**1,651.9889**

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	9.8000e-003	0.2338	0.0619	1.7200e-003	0.0533	6.0000e-004	0.0539	0.0154	5.7000e-004	0.0160	0.0000	162.9594	162.9594	1.7300e-003	0.0000	163.0027
Worker	0.0234	0.0153	0.1634	6.1000e-004	0.0727	4.3000e-004	0.0731	0.0193	3.9000e-004	0.0197	0.0000	55.2483	55.2483	1.1000e-003	0.0000	55.2758
Total	**0.0332**	**0.2492**	**0.2252**	**2.3300e-003**	**0.1260**	**1.0300e-003**	**0.1270**	**0.0347**	**9.6000e-004**	**0.0357**	**0.0000**	**218.2077**	**218.2077**	**2.8300e-003**	**0.0000**	**218.2785**

3.3 Utilities - Transmission Lines (to be scaled) - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.3176	0.0000	1.3176	0.5343	0.0000	0.5343	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0282	10.6308	7.1745	0.0187		0.4467	0.4467		0.4114	0.4114	0.0000	1,638.834 0	1,638.834 0	0.5261	0.0000	1,651.987 0
Total	**1.0282**	**10.6308**	**7.1745**	**0.0187**	**1.3176**	**0.4467**	**1.7643**	**0.5343**	**0.4114**	**0.9457**	**0.0000**	**1,638.834 0**	**1,638.834 0**	**0.5261**	**0.0000**	**1,651.987 0**

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	9.8000e-003	0.2338	0.0619	1.7200e-003	0.0533	6.0000e-004	0.0539	0.0154	5.7000e-004	0.0160	0.0000	162.9594	162.9594	1.7300e-003	0.0000	163.0027
Worker	0.0234	0.0153	0.1634	6.1000e-004	0.0727	4.3000e-004	0.0731	0.0193	3.9000e-004	0.0197	0.0000	55.2483	55.2483	1.1000e-003	0.0000	55.2758
Total	**0.0332**	**0.2492**	**0.2252**	**2.3300e-003**	**0.1260**	**1.0300e-003**	**0.1270**	**0.0347**	**9.6000e-004**	**0.0357**	**0.0000**	**218.2077**	**218.2077**	**2.8300e-003**	**0.0000**	**218.2785**

3.3 Utilities - Transmission Lines (to be scaled) - 2025

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					2.3032	0.0000	2.3032	0.8439	0.0000	0.8439	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.6454	6.4308	4.8171	0.0128		0.2697	0.2697		0.2484	0.2484	0.0000	1,119.7320	1,119.7320	0.3595	0.0000	1,128.7188
Total	**0.6454**	**6.4308**	**4.8171**	**0.0128**	**2.3032**	**0.2697**	**2.5729**	**0.8439**	**0.2484**	**1.0923**	**0.0000**	**1,119.7320**	**1,119.7320**	**0.3595**	**0.0000**	**1,128.7188**

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	6.5800e-003	0.1570	0.0409	1.1700e-003	0.0364	4.0000e-004	0.0369	0.0105	3.9000e-004	0.0109	0.0000	110.8192	110.8192	1.1800e-003	0.0000	110.8486
Worker	0.0151	9.4900e-003	0.1029	4.0000e-004	0.0497	2.8000e-004	0.0499	0.0132	2.6000e-004	0.0135	0.0000	36.2530	36.2530	6.8000e-004	0.0000	36.2699
Total	**0.0216**	**0.1664**	**0.1439**	**1.5700e-003**	**0.0861**	**6.8000e-004**	**0.0868**	**0.0237**	**6.5000e-004**	**0.0244**	**0.0000**	**147.0722**	**147.0722**	**1.8600e-003**	**0.0000**	**147.1185**

3.3 Utilities - Transmission Lines (to be scaled) - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0365	0.0000	1.0365	0.3797	0.0000	0.3797	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.6454	6.4308	4.8171	0.0128		0.2697	0.2697		0.2484	0.2484	0.0000	1,119.7307	1,119.7307	0.3595	0.0000	1,128.7175
Total	**0.6454**	**6.4308**	**4.8171**	**0.0128**	**1.0365**	**0.2697**	**1.3061**	**0.3797**	**0.2484**	**0.6281**	**0.0000**	**1,119.7307**	**1,119.7307**	**0.3595**	**0.0000**	**1,128.7175**

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	6.5800e-003	0.1570	0.0409	1.1700e-003	0.0364	4.0000e-004	0.0369	0.0105	3.9000e-004	0.0109	0.0000	110.8192	110.8192	1.1800e-003	0.0000	110.8486
Worker	0.0151	9.4900e-003	0.1029	4.0000e-004	0.0497	2.8000e-004	0.0499	0.0132	2.6000e-004	0.0135	0.0000	36.2530	36.2530	6.8000e-004	0.0000	36.2699
Total	**0.0216**	**0.1664**	**0.1439**	**1.5700e-003**	**0.0861**	**6.8000e-004**	**0.0868**	**0.0237**	**6.5000e-004**	**0.0244**	**0.0000**	**147.0722**	**147.0722**	**1.8600e-003**	**0.0000**	**147.1185**

3.4 Transmission Lines PTs - 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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0188	0.1908	0.2010	3.1000e-004		9.9500e-003	9.9500e-003		9.1600e-003	9.1600e-003	0.0000	27.1399	27.1399	8.7800e-003	0.0000	27.3593
Total	**0.0188**	**0.1908**	**0.2010**	**3.1000e-004**	**0.0000**	**9.9500e-003**	**9.9500e-003**	**0.0000**	**9.1600e-003**	**9.1600e-003**	**0.0000**	**27.1399**	**27.1399**	**8.7800e-003**	**0.0000**	**27.3593**

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	1.0600e-003	7.6000e-004	7.6800e-003	3.0000e-005	2.8800e-003	2.0000e-005	2.9000e-003	7.7000e-004	2.0000e-005	7.8000e-004	0.0000	2.3683	2.3683	5.0000e-005	0.0000	2.3696
Total	**1.0600e-003**	**7.6000e-004**	**7.6800e-003**	**3.0000e-005**	**2.8800e-003**	**2.0000e-005**	**2.9000e-003**	**7.7000e-004**	**2.0000e-005**	**7.8000e-004**	**0.0000**	**2.3683**	**2.3683**	**5.0000e-005**	**0.0000**	**2.3696**

3.4 Transmission Lines PTs - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0188	0.1908	0.2010	3.1000e-004		9.9500e-003	9.9500e-003		9.1600e-003	9.1600e-003	0.0000	27.1398	27.1398	8.7800e-003	0.0000	27.3593
Total	**0.0188**	**0.1908**	**0.2010**	**3.1000e-004**	**0.0000**	**9.9500e-003**	**9.9500e-003**	**0.0000**	**9.1600e-003**	**9.1600e-003**	**0.0000**	**27.1398**	**27.1398**	**8.7800e-003**	**0.0000**	**27.3593**

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	1.0600e-003	7.6000e-004	7.6800e-003	3.0000e-005	2.8800e-003	2.0000e-005	2.9000e-003	7.7000e-004	2.0000e-005	7.8000e-004	0.0000	2.3683	2.3683	5.0000e-005	0.0000	2.3696
Total	**1.0600e-003**	**7.6000e-004**	**7.6800e-003**	**3.0000e-005**	**2.8800e-003**	**2.0000e-005**	**2.9000e-003**	**7.7000e-004**	**2.0000e-005**	**7.8000e-004**	**0.0000**	**2.3683**	**2.3683**	**5.0000e-005**	**0.0000**	**2.3696**

3.4 Transmission Lines PTs - 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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2265	2.2346	2.6017	4.0200e-003		0.1163	0.1163		0.1070	0.1070	0.0000	352.7770	352.7770	0.1141	0.0000	355.6294
Total	**0.2265**	**2.2346**	**2.6017**	**4.0200e-003**	**0.0000**	**0.1163**	**0.1163**	**0.0000**	**0.1070**	**0.1070**	**0.0000**	**352.7770**	**352.7770**	**0.1141**	**0.0000**	**355.6294**

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	0.0129	8.8000e-003	0.0911	3.3000e-004	0.0375	2.2000e-004	0.0377	9.9600e-003	2.1000e-004	0.0102	0.0000	29.6377	29.6377	6.3000e-004	0.0000	29.6535
Total	**0.0129**	**8.8000e-003**	**0.0911**	**3.3000e-004**	**0.0375**	**2.2000e-004**	**0.0377**	**9.9600e-003**	**2.1000e-004**	**0.0102**	**0.0000**	**29.6377**	**29.6377**	**6.3000e-004**	**0.0000**	**29.6535**

3.4 Transmission Lines PTs - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2265	2.2346	2.6017	4.0200e-003		0.1163	0.1163		0.1070	0.1070	0.0000	352.7766	352.7766	0.1141	0.0000	355.6290
Total	**0.2265**	**2.2346**	**2.6017**	**4.0200e-003**	**0.0000**	**0.1163**	**0.1163**	**0.0000**	**0.1070**	**0.1070**	**0.0000**	**352.7766**	**352.7766**	**0.1141**	**0.0000**	**355.6290**

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	0.0129	8.8000e-003	0.0911	3.3000e-004	0.0375	2.2000e-004	0.0377	9.9600e-003	2.1000e-004	0.0102	0.0000	29.6377	29.6377	6.3000e-004	0.0000	29.6535
Total	**0.0129**	**8.8000e-003**	**0.0911**	**3.3000e-004**	**0.0375**	**2.2000e-004**	**0.0377**	**9.9600e-003**	**2.1000e-004**	**0.0102**	**0.0000**	**29.6377**	**29.6377**	**6.3000e-004**	**0.0000**	**29.6535**

3.4 Transmission Lines PTs - 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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2174	2.1032	2.6284	4.0500e-003		0.1085	0.1085		0.0998	0.0998	0.0000	355.4805	355.4805	0.1150	0.0000	358.3548
Total	**0.2174**	**2.1032**	**2.6284**	**4.0500e-003**	**0.0000**	**0.1085**	**0.1085**	**0.0000**	**0.0998**	**0.0998**	**0.0000**	**355.4805**	**355.4805**	**0.1150**	**0.0000**	**358.3548**

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	0.0122	7.9800e-003	0.0849	3.2000e-004	0.0378	2.2000e-004	0.0380	0.0100	2.0000e-004	0.0102	0.0000	28.7291	28.7291	5.7000e-004	0.0000	28.7434
Total	**0.0122**	**7.9800e-003**	**0.0849**	**3.2000e-004**	**0.0378**	**2.2000e-004**	**0.0380**	**0.0100**	**2.0000e-004**	**0.0102**	**0.0000**	**28.7291**	**28.7291**	**5.7000e-004**	**0.0000**	**28.7434**

3.4 Transmission Lines PTs - 2024

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2174	2.1032	2.6284	4.0500e-003		0.1085	0.1085		0.0998	0.0998	0.0000	355.4801	355.4801	0.1150	0.0000	358.3543
Total	**0.2174**	**2.1032**	**2.6284**	**4.0500e-003**	**0.0000**	**0.1085**	**0.1085**	**0.0000**	**0.0998**	**0.0998**	**0.0000**	**355.4801**	**355.4801**	**0.1150**	**0.0000**	**358.3543**

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	0.0122	7.9800e-003	0.0849	3.2000e-004	0.0378	2.2000e-004	0.0380	0.0100	2.0000e-004	0.0102	0.0000	28.7291	28.7291	5.7000e-004	0.0000	28.7434
Total	**0.0122**	**7.9800e-003**	**0.0849**	**3.2000e-004**	**0.0378**	**2.2000e-004**	**0.0380**	**0.0100**	**2.0000e-004**	**0.0102**	**0.0000**	**28.7291**	**28.7291**	**5.7000e-004**	**0.0000**	**28.7434**

3.4 Transmission Lines PTs - 2025

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1331	1.2289	1.7783	2.7500e-003		0.0636	0.0636		0.0585	0.0585	0.0000	241.6632	241.6632	0.0782	0.0000	243.6172
Total	**0.1331**	**1.2289**	**1.7783**	**2.7500e-003**	**0.0000**	**0.0636**	**0.0636**	**0.0000**	**0.0585**	**0.0585**	**0.0000**	**241.6632**	**241.6632**	**0.0782**	**0.0000**	**243.6172**

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	7.7900e-003	4.9100e-003	0.0532	2.1000e-004	0.0257	1.5000e-004	0.0258	6.8200e-003	1.4000e-004	6.9600e-003	0.0000	18.7462	18.7462	3.5000e-004	0.0000	18.7550
Total	**7.7900e-003**	**4.9100e-003**	**0.0532**	**2.1000e-004**	**0.0257**	**1.5000e-004**	**0.0258**	**6.8200e-003**	**1.4000e-004**	**6.9600e-003**	**0.0000**	**18.7462**	**18.7462**	**3.5000e-004**	**0.0000**	**18.7550**

3.4 Transmission Lines PTs - 2025

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1331	1.2289	1.7783	2.7500e-003		0.0636	0.0636		0.0585	0.0585	0.0000	241.6629	241.6629	0.0782	0.0000	243.6169
Total	**0.1331**	**1.2289**	**1.7783**	**2.7500e-003**	**0.0000**	**0.0636**	**0.0636**	**0.0000**	**0.0585**	**0.0585**	**0.0000**	**241.6629**	**241.6629**	**0.0782**	**0.0000**	**243.6169**

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	7.7900e-003	4.9100e-003	0.0532	2.1000e-004	0.0257	1.5000e-004	0.0258	6.8200e-003	1.4000e-004	6.9600e-003	0.0000	18.7462	18.7462	3.5000e-004	0.0000	18.7550
Total	**7.7900e-003**	**4.9100e-003**	**0.0532**	**2.1000e-004**	**0.0257**	**1.5000e-004**	**0.0258**	**6.8200e-003**	**1.4000e-004**	**6.9600e-003**	**0.0000**	**18.7462**	**18.7462**	**3.5000e-004**	**0.0000**	**18.7550**

3.5 Roadway - Excavation - 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					5.0504	0.0000	5.0504	2.5404	0.0000	2.5404	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.4256	13.0693	10.3565	0.0273		0.5505	0.5505		0.5075	0.5075	0.0000	2,392.3079	2,392.3079	0.7648	0.0000	2,411.4269
Total	**1.4256**	**13.0693**	**10.3565**	**0.0273**	**5.0504**	**0.5505**	**5.6008**	**2.5404**	**0.5075**	**3.0478**	**0.0000**	**2,392.3079**	**2,392.3079**	**0.7648**	**0.0000**	**2,411.4269**

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	4.0000e-005	9.8000e-004	2.6000e-004	1.0000e-005	2.1000e-004	0.0000	2.1000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.6211	0.6211	1.0000e-005	0.0000	0.6214
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	0.0207	0.2143	7.7000e-004	0.0882	5.3000e-004	0.0887	0.0234	4.9000e-004	0.0239	0.0000	69.7100	69.7100	1.4800e-003	0.0000	69.7471
Total	**0.0304**	**0.0217**	**0.2146**	**7.8000e-004**	**0.0884**	**5.3000e-004**	**0.0889**	**0.0235**	**4.9000e-004**	**0.0240**	**0.0000**	**70.3311**	**70.3311**	**1.4900e-003**	**0.0000**	**70.3684**

3.5 Roadway - Excavation - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.2727	0.0000	2.2727	1.1432	0.0000	1.1432	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.4256	13.0693	10.3565	0.0273		0.5505	0.5505		0.5075	0.5075	0.0000	2,392.305 1	2,392.305 1	0.7648	0.0000	2,411.4241
Total	**1.4256**	**13.0693**	**10.3565**	**0.0273**	**2.2727**	**0.5505**	**2.8231**	**1.1432**	**0.5075**	**1.6506**	**0.0000**	**2,392.305 1**	**2,392.305 1**	**0.7648**	**0.0000**	**2,411.424 1**

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	4.0000e-005	9.8000e-004	2.6000e-004	1.0000e-005	2.1000e-004	0.0000	2.1000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.6211	0.6211	1.0000e-005	0.0000	0.6214
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	0.0207	0.2143	7.7000e-004	0.0882	5.3000e-004	0.0887	0.0234	4.9000e-004	0.0239	0.0000	69.7100	69.7100	1.4800e-003	0.0000	69.7471
Total	**0.0304**	**0.0217**	**0.2146**	**7.8000e-004**	**0.0884**	**5.3000e-004**	**0.0889**	**0.0235**	**4.9000e-004**	**0.0240**	**0.0000**	**70.3311**	**70.3311**	**1.4900e-003**	**0.0000**	**70.3684**

3.5 Roadway - Excavation - 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					2.0694	0.0000	2.0694	0.9018	0.0000	0.9018	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4794	4.2620	3.4984	9.2900e-003		0.1796	0.1796		0.1656	0.1656	0.0000	813.4212	813.4212	0.2600	0.0000	819.9220
Total	**0.4794**	**4.2620**	**3.4984**	**9.2900e-003**	**2.0694**	**0.1796**	**2.2490**	**0.9018**	**0.1656**	**1.0674**	**0.0000**	**813.4212**	**813.4212**	**0.2600**	**0.0000**	**819.9220**

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	1.0000e-005	3.2000e-004	9.0000e-005	0.0000	1.8000e-004	0.0000	1.8000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.2099	0.2099	0.0000	0.0000	0.2100
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	9.6700e-003	6.3300e-003	0.0674	2.5000e-004	0.0300	1.8000e-004	0.0302	7.9700e-003	1.6000e-004	8.1300e-003	0.0000	22.7994	22.7994	4.5000e-004	0.0000	22.8108
Total	**9.6800e-003**	**6.6500e-003**	**0.0675**	**2.5000e-004**	**0.0302**	**1.8000e-004**	**0.0304**	**8.0200e-003**	**1.6000e-004**	**8.1800e-003**	**0.0000**	**23.0093**	**23.0093**	**4.5000e-004**	**0.0000**	**23.0208**

3.5 Roadway - Excavation - 2024

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					0.9312	0.0000	0.9312	0.4058	0.0000	0.4058	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4794	4.2620	3.4984	9.2900e-003		0.1796	0.1796		0.1656	0.1656	0.0000	813.4203	813.4203	0.2600	0.0000	819.9210
Total	**0.4794**	**4.2620**	**3.4984**	**9.2900e-003**	**0.9312**	**0.1796**	**1.1109**	**0.4058**	**0.1656**	**0.5714**	**0.0000**	**813.4203**	**813.4203**	**0.2600**	**0.0000**	**819.9210**

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	1.0000e-005	3.2000e-004	9.0000e-005	0.0000	1.8000e-004	0.0000	1.8000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.2099	0.2099	0.0000	0.0000	0.2100
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	9.6700e-003	6.3300e-003	0.0674	2.5000e-004	0.0300	1.8000e-004	0.0302	7.9700e-003	1.6000e-004	8.1300e-003	0.0000	22.7994	22.7994	4.5000e-004	0.0000	22.8108
Total	**9.6800e-003**	**6.6500e-003**	**0.0675**	**2.5000e-004**	**0.0302**	**1.8000e-004**	**0.0304**	**8.0200e-003**	**1.6000e-004**	**8.1800e-003**	**0.0000**	**23.0093**	**23.0093**	**4.5000e-004**	**0.0000**	**23.0208**

3.6 Roadway - Grading and Paving - 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					0.4642	0.0000	0.4642	0.0502	0.0000	0.0502	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4790	5.2085	4.0759	9.0600e-003		0.2171	0.2171		0.1998	0.1998	0.0000	796.1139	796.1139	0.2575	0.0000	802.5509
Total	**0.4790**	**5.2085**	**4.0759**	**9.0600e-003**	**0.4642**	**0.2171**	**0.6813**	**0.0502**	**0.1998**	**0.2500**	**0.0000**	**796.1139**	**796.1139**	**0.2575**	**0.0000**	**802.5509**

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	3.0000e-005	7.7000e-004	2.1000e-004	1.0000e-005	2.0000e-004	0.0000	2.0000e-004	5.0000e-005	0.0000	6.0000e-005	0.0000	0.5014	0.5014	1.0000e-005	0.0000	0.5016
Vendor	0.0132	0.3153	0.0834	2.3100e-003	0.0719	8.0000e-004	0.0727	0.0208	7.7000e-004	0.0215	0.0000	219.7671	219.7671	2.3400e-003	0.0000	219.8255
Worker	7.5800e-003	4.9700e-003	0.0529	2.0000e-004	0.0235	1.4000e-004	0.0237	6.2500e-003	1.3000e-004	6.3800e-003	0.0000	17.8819	17.8819	3.6000e-004	0.0000	17.8908
Total	**0.0208**	**0.3211**	**0.1365**	**2.5200e-003**	**0.0957**	**9.4000e-004**	**0.0966**	**0.0271**	**9.0000e-004**	**0.0280**	**0.0000**	**238.1504**	**238.1504**	**2.7100e-003**	**0.0000**	**238.2180**

3.6 Roadway - Grading and Paving - 2024

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					0.2089	0.0000	0.2089	0.0226	0.0000	0.0226	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4790	5.2085	4.0759	9.0600e-003		0.2171	0.2171		0.1998	0.1998	0.0000	796.1129	796.1129	0.2575	0.0000	802.5499
Total	**0.4790**	**5.2085**	**4.0759**	**9.0600e-003**	**0.2089**	**0.2171**	**0.4260**	**0.0226**	**0.1998**	**0.2224**	**0.0000**	**796.1129**	**796.1129**	**0.2575**	**0.0000**	**802.5499**

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	3.0000e-005	7.7000e-004	2.1000e-004	1.0000e-005	2.0000e-004	0.0000	2.0000e-004	5.0000e-005	0.0000	6.0000e-005	0.0000	0.5014	0.5014	1.0000e-005	0.0000	0.5016
Vendor	0.0132	0.3153	0.0834	2.3100e-003	0.0719	8.0000e-004	0.0727	0.0208	7.7000e-004	0.0215	0.0000	219.7671	219.7671	2.3400e-003	0.0000	219.8255
Worker	7.5800e-003	4.9700e-003	0.0529	2.0000e-004	0.0235	1.4000e-004	0.0237	6.2500e-003	1.3000e-004	6.3800e-003	0.0000	17.8819	17.8819	3.6000e-004	0.0000	17.8908
Total	**0.0208**	**0.3211**	**0.1365**	**2.5200e-003**	**0.0957**	**9.4000e-004**	**0.0966**	**0.0271**	**9.0000e-004**	**0.0280**	**0.0000**	**238.1504**	**238.1504**	**2.7100e-003**	**0.0000**	**238.2180**

3.6 Roadway - Grading and Paving - 2025

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					0.4642	0.0000	0.4642	0.0502	0.0000	0.0502	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2837	2.9860	2.6043	5.8600e-003		0.1236	0.1236		0.1137	0.1137	0.0000	514.3112	514.3112	0.1663	0.0000	518.4697
Total	**0.2837**	**2.9860**	**2.6043**	**5.8600e-003**	**0.4642**	**0.1236**	**0.5878**	**0.0502**	**0.1137**	**0.1639**	**0.0000**	**514.3112**	**514.3112**	**0.1663**	**0.0000**	**518.4697**

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	2.0000e-005	4.8000e-004	1.3000e-004	0.0000	1.9000e-004	0.0000	1.9000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.3222	0.3222	1.0000e-005	0.0000	0.3223
Vendor	8.4000e-003	0.2002	0.0522	1.4900e-003	0.0465	5.1000e-004	0.0470	0.0134	4.9000e-004	0.0139	0.0000	141.3615	141.3615	1.5000e-003	0.0000	141.3990
Worker	4.6100e-003	2.9000e-003	0.0315	1.2000e-004	0.0152	9.0000e-005	0.0153	4.0400e-003	8.0000e-005	4.1200e-003	0.0000	11.0987	11.0987	2.1000e-004	0.0000	11.1039
Total	**0.0130**	**0.2036**	**0.0839**	**1.6100e-003**	**0.0619**	**6.0000e-004**	**0.0625**	**0.0175**	**5.7000e-004**	**0.0181**	**0.0000**	**152.7824**	**152.7824**	**1.7200e-003**	**0.0000**	**152.8252**

3.6 Roadway - Grading and Paving - 2025

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					0.2089	0.0000	0.2089	0.0226	0.0000	0.0226	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2837	2.9860	2.6043	5.8600e-003		0.1236	0.1236		0.1137	0.1137	0.0000	514.3106	514.3106	0.1663	0.0000	518.4691
Total	**0.2837**	**2.9860**	**2.6043**	**5.8600e-003**	**0.2089**	**0.1236**	**0.3325**	**0.0226**	**0.1137**	**0.1363**	**0.0000**	**514.3106**	**514.3106**	**0.1663**	**0.0000**	**518.4691**

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	2.0000e-005	4.8000e-004	1.3000e-004	0.0000	1.9000e-004	0.0000	1.9000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.3222	0.3222	1.0000e-005	0.0000	0.3223
Vendor	8.4000e-003	0.2002	0.0522	1.4900e-003	0.0465	5.1000e-004	0.0470	0.0134	4.9000e-004	0.0139	0.0000	141.3615	141.3615	1.5000e-003	0.0000	141.3990
Worker	4.6100e-003	2.9000e-003	0.0315	1.2000e-004	0.0152	9.0000e-005	0.0153	4.0400e-003	8.0000e-005	4.1200e-003	0.0000	11.0987	11.0987	2.1000e-004	0.0000	11.1039
Total	**0.0130**	**0.2036**	**0.0839**	**1.6100e-003**	**0.0619**	**6.0000e-004**	**0.0625**	**0.0175**	**5.7000e-004**	**0.0181**	**0.0000**	**152.7824**	**152.7824**	**1.7200e-003**	**0.0000**	**152.8252**

3.7 Dam Facilities - Site Preparation - 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					2.9734	0.0000	2.9734	1.5280	0.0000	1.5280	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.8204	7.5687	5.4016	0.0152		0.3157	0.3157		0.2908	0.2908	0.0000	1,334.9048	1,334.9048	0.4289	0.0000	1,345.6270
Total	**0.8204**	**7.5687**	**5.4016**	**0.0152**	**2.9734**	**0.3157**	**3.2892**	**1.5280**	**0.2908**	**1.8189**	**0.0000**	**1,334.9048**	**1,334.9048**	**0.4289**	**0.0000**	**1,345.6270**

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	3.0000e-005	7.3000e-004	2.0000e-004	0.0000	1.3000e-004	0.0000	1.3000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.4743	0.4743	1.0000e-005	0.0000	0.4745
Vendor	3.7700e-003	0.0900	0.0238	6.6000e-004	0.0205	2.3000e-004	0.0208	5.9200e-003	2.2000e-004	6.1400e-003	0.0000	62.7165	62.7165	6.7000e-004	0.0000	62.7332
Worker	7.3600e-003	4.8200e-003	0.0513	1.9000e-004	0.0228	1.3000e-004	0.0230	6.0600e-003	1.2000e-004	6.1900e-003	0.0000	17.3505	17.3505	3.5000e-004	0.0000	17.3591
Total	**0.0112**	**0.0955**	**0.0753**	**8.5000e-004**	**0.0435**	**3.6000e-004**	**0.0439**	**0.0120**	**3.4000e-004**	**0.0124**	**0.0000**	**80.5413**	**80.5413**	**1.0300e-003**	**0.0000**	**80.5668**

3.7 Dam Facilities - Site Preparation - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.3380	0.0000	1.3380	0.6876	0.0000	0.6876	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.8204	7.5687	5.4015	0.0152		0.3157	0.3157		0.2908	0.2908	0.0000	1,334.9032	1,334.9032	0.4289	0.0000	1,345.6254
Total	**0.8204**	**7.5687**	**5.4015**	**0.0152**	**1.3380**	**0.3157**	**1.6538**	**0.6876**	**0.2908**	**0.9784**	**0.0000**	**1,334.9032**	**1,334.9032**	**0.4289**	**0.0000**	**1,345.6254**

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	3.0000e-005	7.3000e-004	2.0000e-004	0.0000	1.3000e-004	0.0000	1.3000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.4743	0.4743	1.0000e-005	0.0000	0.4745
Vendor	3.7700e-003	0.0900	0.0238	6.6000e-004	0.0205	2.3000e-004	0.0208	5.9200e-003	2.2000e-004	6.1400e-003	0.0000	62.7165	62.7165	6.7000e-004	0.0000	62.7332
Worker	7.3600e-003	4.8200e-003	0.0513	1.9000e-004	0.0228	1.3000e-004	0.0230	6.0600e-003	1.2000e-004	6.1900e-003	0.0000	17.3505	17.3505	3.5000e-004	0.0000	17.3591
Total	**0.0112**	**0.0955**	**0.0753**	**8.5000e-004**	**0.0435**	**3.6000e-004**	**0.0439**	**0.0120**	**3.4000e-004**	**0.0124**	**0.0000**	**80.5413**	**80.5413**	**1.0300e-003**	**0.0000**	**80.5668**

3.8 Pumping Plant - 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					0.7755	0.0000	0.7755	0.3671	0.0000	0.3671	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4228	3.6599	3.1369	8.6900e-003		0.1504	0.1504		0.1390	0.1390	0.0000	758.4476	758.4476	0.2402	0.0000	764.4528
Total	**0.4228**	**3.6599**	**3.1369**	**8.6900e-003**	**0.7755**	**0.1504**	**0.9258**	**0.3671**	**0.1390**	**0.5060**	**0.0000**	**758.4476**	**758.4476**	**0.2402**	**0.0000**	**764.4528**

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	3.0000e-005	7.7000e-004	2.1000e-004	1.0000e-005	1.8000e-004	0.0000	1.8000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.5009	0.5009	1.0000e-005	0.0000	0.5011
Vendor	8.8000e-004	0.0211	5.5900e-003	1.5000e-004	4.8200e-003	5.0000e-005	4.8700e-003	1.3900e-003	5.0000e-005	1.4400e-003	0.0000	14.7203	14.7203	1.6000e-004	0.0000	14.7242
Worker	0.0198	0.0130	0.1381	5.2000e-004	0.0614	3.6000e-004	0.0618	0.0163	3.3000e-004	0.0167	0.0000	46.7123	46.7123	9.3000e-004	0.0000	46.7355
Total	**0.0207**	**0.0349**	**0.1439**	**6.8000e-004**	**0.0664**	**4.1000e-004**	**0.0669**	**0.0178**	**3.8000e-004**	**0.0182**	**0.0000**	**61.9334**	**61.9334**	**1.1000e-003**	**0.0000**	**61.9608**

3.8 Pumping Plant - 2024

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					0.3490	0.0000	0.3490	0.1652	0.0000	0.1652	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4228	3.6599	3.1369	8.6900e-003		0.1504	0.1504		0.1390	0.1390	0.0000	758.4467	758.4467	0.2402	0.0000	764.4519
Total	**0.4228**	**3.6599**	**3.1369**	**8.6900e-003**	**0.3490**	**0.1504**	**0.4993**	**0.1652**	**0.1390**	**0.3041**	**0.0000**	**758.4467**	**758.4467**	**0.2402**	**0.0000**	**764.4519**

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	3.0000e-005	7.7000e-004	2.1000e-004	1.0000e-005	1.8000e-004	0.0000	1.8000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.5009	0.5009	1.0000e-005	0.0000	0.5011
Vendor	8.8000e-004	0.0211	5.5900e-003	1.5000e-004	4.8200e-003	5.0000e-005	4.8700e-003	1.3900e-003	5.0000e-005	1.4400e-003	0.0000	14.7203	14.7203	1.6000e-004	0.0000	14.7242
Worker	0.0198	0.0130	0.1381	5.2000e-004	0.0614	3.6000e-004	0.0618	0.0163	3.3000e-004	0.0167	0.0000	46.7123	46.7123	9.3000e-004	0.0000	46.7355
Total	**0.0207**	**0.0349**	**0.1439**	**6.8000e-004**	**0.0664**	**4.1000e-004**	**0.0669**	**0.0178**	**3.8000e-004**	**0.0182**	**0.0000**	**61.9334**	**61.9334**	**1.1000e-003**	**0.0000**	**61.9608**

3.8 Pumping Plant - 2025

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					0.4006	0.0000	0.4006	0.1610	0.0000	0.1610	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1658	1.3645	1.2835	3.6100e-003		0.0551	0.0551		0.0509	0.0509	0.0000	315.0496	315.0496	0.0998	0.0000	317.5441
Total	**0.1658**	**1.3645**	**1.2835**	**3.6100e-003**	**0.4006**	**0.0551**	**0.4557**	**0.1610**	**0.0509**	**0.2119**	**0.0000**	**315.0496**	**315.0496**	**0.0998**	**0.0000**	**317.5441**

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	1.0000e-005	3.1000e-004	8.0000e-005	0.0000	1.6000e-004	0.0000	1.6000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.2070	0.2070	0.0000	0.0000	0.2070
Vendor	3.6000e-004	8.6200e-003	2.2500e-003	6.0000e-005	2.0000e-003	2.0000e-005	2.0200e-003	5.8000e-004	2.0000e-005	6.0000e-004	0.0000	6.0878	6.0878	6.0000e-005	0.0000	6.0895
Worker	7.7500e-003	4.8800e-003	0.0529	2.1000e-004	0.0255	1.5000e-004	0.0257	6.7800e-003	1.3000e-004	6.9200e-003	0.0000	18.6409	18.6409	3.5000e-004	0.0000	18.6496
Total	**8.1200e-003**	**0.0138**	**0.0553**	**2.7000e-004**	**0.0277**	**1.7000e-004**	**0.0279**	**7.4000e-003**	**1.5000e-004**	**7.5600e-003**	**0.0000**	**24.9357**	**24.9357**	**4.1000e-004**	**0.0000**	**24.9461**

3.8 Pumping Plant - 2025

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					0.1803	0.0000	0.1803	0.0725	0.0000	0.0725	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1658	1.3645	1.2835	3.6100e-003		0.0551	0.0551		0.0509	0.0509	0.0000	315.0493	315.0493	0.0998	0.0000	317.5437
Total	**0.1658**	**1.3645**	**1.2835**	**3.6100e-003**	**0.1803**	**0.0551**	**0.2353**	**0.0725**	**0.0509**	**0.1234**	**0.0000**	**315.0493**	**315.0493**	**0.0998**	**0.0000**	**317.5437**

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	1.0000e-005	3.1000e-004	8.0000e-005	0.0000	1.6000e-004	0.0000	1.6000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.2070	0.2070	0.0000	0.0000	0.2070
Vendor	3.6000e-004	8.6200e-003	2.2500e-003	6.0000e-005	2.0000e-003	2.0000e-005	2.0200e-003	5.8000e-004	2.0000e-005	6.0000e-004	0.0000	6.0878	6.0878	6.0000e-005	0.0000	6.0895
Worker	7.7500e-003	4.8800e-003	0.0529	2.1000e-004	0.0255	1.5000e-004	0.0257	6.7800e-003	1.3000e-004	6.9200e-003	0.0000	18.6409	18.6409	3.5000e-004	0.0000	18.6496
Total	**8.1200e-003**	**0.0138**	**0.0553**	**2.7000e-004**	**0.0277**	**1.7000e-004**	**0.0279**	**7.4000e-003**	**1.5000e-004**	**7.5600e-003**	**0.0000**	**24.9357**	**24.9357**	**4.1000e-004**	**0.0000**	**24.9461**

3.9 Tunneling - Outlet and Conveyance - 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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0792	0.6416	0.5069	1.5800e-003		0.0247	0.0247		0.0235	0.0235	0.0000	132.8564	132.8564	0.0366	0.0000	133.7712
Total	**0.0792**	**0.6416**	**0.5069**	**1.5800e-003**	**0.0000**	**0.0247**	**0.0247**	**0.0000**	**0.0235**	**0.0235**	**0.0000**	**132.8564**	**132.8564**	**0.0366**	**0.0000**	**133.7712**

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	3.0500e-003	2.0000e-003	0.0213	8.0000e-005	9.4800e-003	6.0000e-005	9.5300e-003	2.5200e-003	5.0000e-005	2.5700e-003	0.0000	7.2034	7.2034	1.4000e-004	0.0000	7.2070
Total	**3.0500e-003**	**2.0000e-003**	**0.0213**	**8.0000e-005**	**9.4800e-003**	**6.0000e-005**	**9.5300e-003**	**2.5200e-003**	**5.0000e-005**	**2.5700e-003**	**0.0000**	**7.2034**	**7.2034**	**1.4000e-004**	**0.0000**	**7.2070**

3.9 Tunneling - Outlet and Conveyance - 2024

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0792	0.6416	0.5069	1.5800e-003		0.0247	0.0247		0.0235	0.0235	0.0000	132.8562	132.8562	0.0366	0.0000	133.7710
Total	**0.0792**	**0.6416**	**0.5069**	**1.5800e-003**	**0.0000**	**0.0247**	**0.0247**	**0.0000**	**0.0235**	**0.0235**	**0.0000**	**132.8562**	**132.8562**	**0.0366**	**0.0000**	**133.7710**

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	3.0500e-003	2.0000e-003	0.0213	8.0000e-005	9.4800e-003	6.0000e-005	9.5300e-003	2.5200e-003	5.0000e-005	2.5700e-003	0.0000	7.2034	7.2034	1.4000e-004	0.0000	7.2070
Total	**3.0500e-003**	**2.0000e-003**	**0.0213**	**8.0000e-005**	**9.4800e-003**	**6.0000e-005**	**9.5300e-003**	**2.5200e-003**	**5.0000e-005**	**2.5700e-003**	**0.0000**	**7.2034**	**7.2034**	**1.4000e-004**	**0.0000**	**7.2070**

3.9 Tunneling - Outlet and Conveyance - 2025

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1659	1.3190	1.0795	3.3800e-003		0.0499	0.0499		0.0475	0.0475	0.0000	284.2446	284.2446	0.0783	0.0000	286.2019
Total	**0.1659**	**1.3190**	**1.0795**	**3.3800e-003**	**0.0000**	**0.0499**	**0.0499**	**0.0000**	**0.0475**	**0.0475**	**0.0000**	**284.2446**	**284.2446**	**0.0783**	**0.0000**	**286.2019**

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	6.1500e-003	3.8700e-003	0.0420	1.6000e-004	0.0203	1.2000e-004	0.0204	5.3900e-003	1.1000e-004	5.4900e-003	0.0000	14.8009	14.8009	2.8000e-004	0.0000	14.8079
Total	**6.1500e-003**	**3.8700e-003**	**0.0420**	**1.6000e-004**	**0.0203**	**1.2000e-004**	**0.0204**	**5.3900e-003**	**1.1000e-004**	**5.4900e-003**	**0.0000**	**14.8009**	**14.8009**	**2.8000e-004**	**0.0000**	**14.8079**

3.9 Tunneling - Outlet and Conveyance - 2025

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1659	1.3190	1.0795	3.3800e-003		0.0499	0.0499		0.0475	0.0475	0.0000	284.2443	284.2443	0.0783	0.0000	286.2015
Total	**0.1659**	**1.3190**	**1.0795**	**3.3800e-003**	**0.0000**	**0.0499**	**0.0499**	**0.0000**	**0.0475**	**0.0475**	**0.0000**	**284.2443**	**284.2443**	**0.0783**	**0.0000**	**286.2015**

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	6.1500e-003	3.8700e-003	0.0420	1.6000e-004	0.0203	1.2000e-004	0.0204	5.3900e-003	1.1000e-004	5.4900e-003	0.0000	14.8009	14.8009	2.8000e-004	0.0000	14.8079
Total	**6.1500e-003**	**3.8700e-003**	**0.0420**	**1.6000e-004**	**0.0203**	**1.2000e-004**	**0.0204**	**5.3900e-003**	**1.1000e-004**	**5.4900e-003**	**0.0000**	**14.8009**	**14.8009**	**2.8000e-004**	**0.0000**	**14.8079**

3.9 Tunneling - Outlet and Conveyance - 2026

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1659	1.3190	1.0795	3.3800e-003		0.0499	0.0499		0.0475	0.0475	0.0000	284.2446	284.2446	0.0783	0.0000	286.2019
Total	**0.1659**	**1.3190**	**1.0795**	**3.3800e-003**	**0.0000**	**0.0499**	**0.0499**	**0.0000**	**0.0475**	**0.0475**	**0.0000**	**284.2446**	**284.2446**	**0.0783**	**0.0000**	**286.2019**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.8300e-003	3.5300e-003	0.0393	1.6000e-004	0.0203	1.1000e-004	0.0204	5.3900e-003	1.0000e-004	5.4900e-003	0.0000	14.2834	14.2834	2.5000e-004	0.0000	14.2897
Total	**5.8300e-003**	**3.5300e-003**	**0.0393**	**1.6000e-004**	**0.0203**	**1.1000e-004**	**0.0204**	**5.3900e-003**	**1.0000e-004**	**5.4900e-003**	**0.0000**	**14.2834**	**14.2834**	**2.5000e-004**	**0.0000**	**14.2897**

3.9 Tunneling - Outlet and Conveyance - 2026

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1659	1.3190	1.0795	3.3800e-003		0.0499	0.0499		0.0475	0.0475	0.0000	284.2443	284.2443	0.0783	0.0000	286.2015
Total	**0.1659**	**1.3190**	**1.0795**	**3.3800e-003**	**0.0000**	**0.0499**	**0.0499**	**0.0000**	**0.0475**	**0.0475**	**0.0000**	**284.2443**	**284.2443**	**0.0783**	**0.0000**	**286.2015**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.8300e-003	3.5300e-003	0.0393	1.6000e-004	0.0203	1.1000e-004	0.0204	5.3900e-003	1.0000e-004	5.4900e-003	0.0000	14.2834	14.2834	2.5000e-004	0.0000	14.2897
Total	**5.8300e-003**	**3.5300e-003**	**0.0393**	**1.6000e-004**	**0.0203**	**1.1000e-004**	**0.0204**	**5.3900e-003**	**1.0000e-004**	**5.4900e-003**	**0.0000**	**14.2834**	**14.2834**	**2.5000e-004**	**0.0000**	**14.2897**

3.9 Tunneling - Outlet and Conveyance - 2027

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0807	0.6418	0.5253	1.6400e-003		0.0243	0.0243		0.0231	0.0231	0.0000	138.3106	138.3106	0.0381	0.0000	139.2630
Total	**0.0807**	**0.6418**	**0.5253**	**1.6400e-003**	**0.0000**	**0.0243**	**0.0243**	**0.0000**	**0.0231**	**0.0231**	**0.0000**	**138.3106**	**138.3106**	**0.0381**	**0.0000**	**139.2630**

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	2.6800e-003	1.5700e-003	0.0178	7.0000e-005	9.8600e-003	5.0000e-005	9.9200e-003	2.6200e-003	5.0000e-005	2.6700e-003	0.0000	6.7160	6.7160	1.1000e-004	0.0000	6.7188
Total	**2.6800e-003**	**1.5700e-003**	**0.0178**	**7.0000e-005**	**9.8600e-003**	**5.0000e-005**	**9.9200e-003**	**2.6200e-003**	**5.0000e-005**	**2.6700e-003**	**0.0000**	**6.7160**	**6.7160**	**1.1000e-004**	**0.0000**	**6.7188**

3.9 Tunneling - Outlet and Conveyance - 2027

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0807	0.6418	0.5253	1.6400e-003		0.0243	0.0243		0.0231	0.0231	0.0000	138.3104	138.3104	0.0381	0.0000	139.2628
Total	**0.0807**	**0.6418**	**0.5253**	**1.6400e-003**	**0.0000**	**0.0243**	**0.0243**	**0.0000**	**0.0231**	**0.0231**	**0.0000**	**138.3104**	**138.3104**	**0.0381**	**0.0000**	**139.2628**

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	2.6800e-003	1.5700e-003	0.0178	7.0000e-005	9.8600e-003	5.0000e-005	9.9200e-003	2.6200e-003	5.0000e-005	2.6700e-003	0.0000	6.7160	6.7160	1.1000e-004	0.0000	6.7188
Total	**2.6800e-003**	**1.5700e-003**	**0.0178**	**7.0000e-005**	**9.8600e-003**	**5.0000e-005**	**9.9200e-003**	**2.6200e-003**	**5.0000e-005**	**2.6700e-003**	**0.0000**	**6.7160**	**6.7160**	**1.1000e-004**	**0.0000**	**6.7188**

3.10 Dam Facilities - Saddle Dams - 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					0.0220	0.0000	0.0220	3.3200e-003	0.0000	3.3200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.9607	7.2953	8.2811	0.0223		0.2995	0.2995		0.2773	0.2773	0.0000	1,948.0118	1,948.0118	0.6148	0.0000	1,963.3817
Total	**0.9607**	**7.2953**	**8.2811**	**0.0223**	**0.0220**	**0.2995**	**0.3214**	**3.3200e-003**	**0.2773**	**0.2806**	**0.0000**	**1,948.0118**	**1,948.0118**	**0.6148**	**0.0000**	**1,963.3817**

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	6.0000e-005	1.4000e-003	3.8000e-004	1.0000e-005	1.2200e-003	0.0000	1.2200e-003	3.1000e-004	0.0000	3.1000e-004	0.0000	0.9138	0.9138	1.0000e-005	0.0000	0.9142
Vendor	0.0108	0.2579	0.0683	1.8900e-003	0.0588	6.6000e-004	0.0595	0.0170	6.3000e-004	0.0176	0.0000	179.7529	179.7529	1.9100e-003	0.0000	179.8007
Worker	0.0142	9.3200e-003	0.0992	3.7000e-004	0.0441	2.6000e-004	0.0444	0.0117	2.4000e-004	0.0120	0.0000	33.5539	33.5539	6.7000e-004	0.0000	33.5706
Total	**0.0251**	**0.2686**	**0.1678**	**2.2700e-003**	**0.1042**	**9.2000e-004**	**0.1051**	**0.0290**	**8.7000e-004**	**0.0299**	**0.0000**	**214.2206**	**214.2206**	**2.5900e-003**	**0.0000**	**214.2854**

3.10 Dam Facilities - Saddle Dams - 2024

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					9.8800e-003	0.0000	9.8800e-003	1.5000e-003	0.0000	1.5000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.9607	7.2953	8.2811	0.0223		0.2995	0.2995		0.2773	0.2773	0.0000	1,948.0095	1,948.0095	0.6148	0.0000	1,963.3794
Total	**0.9607**	**7.2953**	**8.2811**	**0.0223**	**9.8800e-003**	**0.2995**	**0.3094**	**1.5000e-003**	**0.2773**	**0.2788**	**0.0000**	**1,948.0095**	**1,948.0095**	**0.6148**	**0.0000**	**1,963.3794**

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	6.0000e-005	1.4000e-003	3.8000e-004	1.0000e-005	1.2200e-003	0.0000	1.2200e-003	3.1000e-004	0.0000	3.1000e-004	0.0000	0.9138	0.9138	1.0000e-005	0.0000	0.9142
Vendor	0.0108	0.2579	0.0683	1.8900e-003	0.0588	6.6000e-004	0.0595	0.0170	6.3000e-004	0.0176	0.0000	179.7529	179.7529	1.9100e-003	0.0000	179.8007
Worker	0.0142	9.3200e-003	0.0992	3.7000e-004	0.0441	2.6000e-004	0.0444	0.0117	2.4000e-004	0.0120	0.0000	33.5539	33.5539	6.7000e-004	0.0000	33.5706
Total	**0.0251**	**0.2686**	**0.1678**	**2.2700e-003**	**0.1042**	**9.2000e-004**	**0.1051**	**0.0290**	**8.7000e-004**	**0.0299**	**0.0000**	**214.2206**	**214.2206**	**2.5900e-003**	**0.0000**	**214.2854**

3.10 Dam Facilities - Saddle Dams - 2025

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					0.0220	0.0000	0.0220	3.3200e-003	0.0000	3.3200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.3340	16.5170	20.9657	0.0572		0.6576	0.6576		0.6095	0.6095	0.0000	4,983.8642	4,983.8642	1.5729	0.0000	5,023.1869
Total	**2.3340**	**16.5170**	**20.9657**	**0.0572**	**0.0220**	**0.6576**	**0.6796**	**3.3200e-003**	**0.6095**	**0.6128**	**0.0000**	**4,983.8642**	**4,983.8642**	**1.5729**	**0.0000**	**5,023.1869**

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	1.4000e-004	3.5000e-003	9.5000e-004	2.0000e-005	1.3100e-003	1.0000e-005	1.3200e-003	3.4000e-004	1.0000e-005	3.5000e-004	0.0000	2.3251	2.3251	4.0000e-005	0.0000	2.3260
Vendor	0.0272	0.6484	0.1691	4.8200e-003	0.1506	1.6700e-003	0.1522	0.0434	1.5900e-003	0.0450	0.0000	457.8256	457.8256	4.8500e-003	0.0000	457.9470
Worker	0.0343	0.0216	0.2341	9.1000e-004	0.1129	6.5000e-004	0.1136	0.0300	6.0000e-004	0.0306	0.0000	82.4624	82.4624	1.5400e-003	0.0000	82.5010
Total	**0.0616**	**0.6735**	**0.4042**	**5.7500e-003**	**0.2648**	**2.3300e-003**	**0.2671**	**0.0738**	**2.2000e-003**	**0.0760**	**0.0000**	**542.6131**	**542.6131**	**6.4300e-003**	**0.0000**	**542.7739**

3.10 Dam Facilities - Saddle Dams - 2025

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					9.8800e-003	0.0000	9.8800e-003	1.5000e-003	0.0000	1.5000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.3340	16.5170	20.9656	0.0572		0.6576	0.6576		0.6095	0.6095	0.0000	4,983.8583	4,983.8583	1.5729	0.0000	5,023.1810
Total	**2.3340**	**16.5170**	**20.9656**	**0.0572**	**9.8800e-003**	**0.6576**	**0.6675**	**1.5000e-003**	**0.6095**	**0.6110**	**0.0000**	**4,983.8583**	**4,983.8583**	**1.5729**	**0.0000**	**5,023.1810**

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	1.4000e-004	3.5000e-003	9.5000e-004	2.0000e-005	1.3100e-003	1.0000e-005	1.3200e-003	3.4000e-004	1.0000e-005	3.5000e-004	0.0000	2.3251	2.3251	4.0000e-005	0.0000	2.3260
Vendor	0.0272	0.6484	0.1691	4.8200e-003	0.1506	1.6700e-003	0.1522	0.0434	1.5900e-003	0.0450	0.0000	457.8256	457.8256	4.8500e-003	0.0000	457.9470
Worker	0.0343	0.0216	0.2341	9.1000e-004	0.1129	6.5000e-004	0.1136	0.0300	6.0000e-004	0.0306	0.0000	82.4624	82.4624	1.5400e-003	0.0000	82.5010
Total	**0.0616**	**0.6735**	**0.4042**	**5.7500e-003**	**0.2648**	**2.3300e-003**	**0.2671**	**0.0738**	**2.2000e-003**	**0.0760**	**0.0000**	**542.6131**	**542.6131**	**6.4300e-003**	**0.0000**	**542.7739**

3.10 Dam Facilities - Saddle Dams - 2026

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					0.0220	0.0000	0.0220	3.3200e-003	0.0000	3.3200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.3340	16.5170	20.9657	0.0572		0.6576	0.6576		0.6095	0.6095	0.0000	4,983.8642	4,983.8642	1.5729	0.0000	5,023.1869
Total	**2.3340**	**16.5170**	**20.9657**	**0.0572**	**0.0220**	**0.6576**	**0.6796**	**3.3200e-003**	**0.6095**	**0.6128**	**0.0000**	**4,983.8642**	**4,983.8642**	**1.5729**	**0.0000**	**5,023.1869**

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	1.4000e-004	3.4100e-003	9.4000e-004	2.0000e-005	1.3100e-003	1.0000e-005	1.3200e-003	3.4000e-004	1.0000e-005	3.5000e-004	0.0000	2.3133	2.3133	4.0000e-005	0.0000	2.3142
Vendor	0.0268	0.6366	0.1649	4.8000e-003	0.1506	1.6500e-003	0.1522	0.0434	1.5800e-003	0.0450	0.0000	455.8777	455.8777	4.8300e-003	0.0000	455.9985
Worker	0.0325	0.0197	0.2188	8.8000e-004	0.1129	6.3000e-004	0.1136	0.0300	5.8000e-004	0.0306	0.0000	79.5789	79.5789	1.4100e-003	0.0000	79.6141
Total	**0.0594**	**0.6597**	**0.3847**	**5.7000e-003**	**0.2648**	**2.2900e-003**	**0.2671**	**0.0738**	**2.1700e-003**	**0.0760**	**0.0000**	**537.7698**	**537.7698**	**6.2800e-003**	**0.0000**	**537.9268**

3.10 Dam Facilities - Saddle Dams - 2026

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					9.8800e-003	0.0000	9.8800e-003	1.5000e-003	0.0000	1.5000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.3340	16.5170	20.9656	0.0572		0.6576	0.6576		0.6095	0.6095	0.0000	4,983.8583	4,983.8583	1.5729	0.0000	5,023.1810
Total	**2.3340**	**16.5170**	**20.9656**	**0.0572**	**9.8800e-003**	**0.6576**	**0.6675**	**1.5000e-003**	**0.6095**	**0.6110**	**0.0000**	**4,983.8583**	**4,983.8583**	**1.5729**	**0.0000**	**5,023.1810**

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	1.4000e-004	3.4100e-003	9.4000e-004	2.0000e-005	1.3100e-003	1.0000e-005	1.3200e-003	3.4000e-004	1.0000e-005	3.5000e-004	0.0000	2.3133	2.3133	4.0000e-005	0.0000	2.3142
Vendor	0.0268	0.6366	0.1649	4.8000e-003	0.1506	1.6500e-003	0.1522	0.0434	1.5800e-003	0.0450	0.0000	455.8777	455.8777	4.8300e-003	0.0000	455.9985
Worker	0.0325	0.0197	0.2188	8.8000e-004	0.1129	6.3000e-004	0.1136	0.0300	5.8000e-004	0.0306	0.0000	79.5789	79.5789	1.4100e-003	0.0000	79.6141
Total	**0.0594**	**0.6597**	**0.3847**	**5.7000e-003**	**0.2648**	**2.2900e-003**	**0.2671**	**0.0738**	**2.1700e-003**	**0.0760**	**0.0000**	**537.7698**	**537.7698**	**6.2800e-003**	**0.0000**	**537.9268**

3.10 Dam Facilities - Saddle Dams - 2027

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					0.0220	0.0000	0.0220	3.3200e-003	0.0000	3.3200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0626	0.4430	0.5623	1.5300e-003		0.0176	0.0176		0.0164	0.0164	0.0000	133.6669	133.6669	0.0422	0.0000	134.7215
Total	**0.0626**	**0.4430**	**0.5623**	**1.5300e-003**	**0.0220**	**0.0176**	**0.0396**	**3.3200e-003**	**0.0164**	**0.0197**	**0.0000**	**133.6669**	**133.6669**	**0.0422**	**0.0000**	**134.7215**

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	9.0000e-005	2.0000e-005	0.0000	1.1600e-003	0.0000	1.1600e-003	2.8000e-004	0.0000	2.8000e-004	0.0000	0.0618	0.0618	0.0000	0.0000	0.0618
Vendor	7.1000e-004	0.0167	4.3200e-003	1.3000e-004	4.0400e-003	4.0000e-005	4.0800e-003	1.1700e-003	4.0000e-005	1.2100e-003	0.0000	12.1767	12.1767	1.3000e-004	0.0000	12.1800
Worker	8.2000e-004	4.8000e-004	5.4700e-003	2.0000e-005	3.0300e-003	2.0000e-005	3.0400e-003	8.0000e-004	1.0000e-005	8.2000e-004	0.0000	2.0624	2.0624	3.0000e-005	0.0000	2.0633
Total	**1.5300e-003**	**0.0173**	**9.8100e-003**	**1.5000e-004**	**8.2300e-003**	**6.0000e-005**	**8.2800e-003**	**2.2500e-003**	**5.0000e-005**	**2.3100e-003**	**0.0000**	**14.3009**	**14.3009**	**1.6000e-004**	**0.0000**	**14.3050**

3.10 Dam Facilities - Saddle Dams - 2027

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					9.8800e-003	0.0000	9.8800e-003	1.5000e-003	0.0000	1.5000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0626	0.4430	0.5623	1.5300e-003		0.0176	0.0176		0.0164	0.0164	0.0000	133.6667	133.6667	0.0422	0.0000	134.7213
Total	**0.0626**	**0.4430**	**0.5623**	**1.5300e-003**	**9.8800e-003**	**0.0176**	**0.0275**	**1.5000e-003**	**0.0164**	**0.0179**	**0.0000**	**133.6667**	**133.6667**	**0.0422**	**0.0000**	**134.7213**

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	9.0000e-005	2.0000e-005	0.0000	1.1600e-003	0.0000	1.1600e-003	2.8000e-004	0.0000	2.8000e-004	0.0000	0.0618	0.0618	0.0000	0.0000	0.0618
Vendor	7.1000e-004	0.0167	4.3200e-003	1.3000e-004	4.0400e-003	4.0000e-005	4.0800e-003	1.1700e-003	4.0000e-005	1.2100e-003	0.0000	12.1767	12.1767	1.3000e-004	0.0000	12.1800
Worker	8.2000e-004	4.8000e-004	5.4700e-003	2.0000e-005	3.0300e-003	2.0000e-005	3.0400e-003	8.0000e-004	1.0000e-005	8.2000e-004	0.0000	2.0624	2.0624	3.0000e-005	0.0000	2.0633
Total	**1.5300e-003**	**0.0173**	**9.8100e-003**	**1.5000e-004**	**8.2300e-003**	**6.0000e-005**	**8.2800e-003**	**2.2500e-003**	**5.0000e-005**	**2.3100e-003**	**0.0000**	**14.3009**	**14.3009**	**1.6000e-004**	**0.0000**	**14.3050**

3.11 Dam Facilities - Main Dam - 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					7.4675	0.0000	7.4675	2.0452	0.0000	2.0452	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.1782	10.5547	8.2058	0.0230		0.4384	0.4384		0.4041	0.4041	0.0000	2,014.2058	2,014.2058	0.6445	0.0000	2,030.3193
Total	**1.1782**	**10.5547**	**8.2058**	**0.0230**	**7.4675**	**0.4384**	**7.9060**	**2.0452**	**0.4041**	**2.4494**	**0.0000**	**2,014.2058**	**2,014.2058**	**0.6445**	**0.0000**	**2,030.3193**

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	8.0000e-005	2.0900e-003	5.6000e-004	1.0000e-005	2.6900e-003	1.0000e-005	2.6900e-003	6.7000e-004	1.0000e-005	6.8000e-004	0.0000	1.3575	1.3575	2.0000e-005	0.0000	1.3581
Vendor	3.4800e-003	0.0830	0.0220	6.1000e-004	0.0189	2.1000e-004	0.0192	5.4600e-003	2.0000e-004	5.6700e-003	0.0000	57.8444	57.8444	6.2000e-004	0.0000	57.8597
Worker	0.0104	6.8300e-003	0.0727	2.7000e-004	0.0323	1.9000e-004	0.0325	8.5900e-003	1.7000e-004	8.7600e-003	0.0000	24.5792	24.5792	4.9000e-004	0.0000	24.5914
Total	**0.0140**	**0.0919**	**0.0952**	**8.9000e-004**	**0.0540**	**4.1000e-004**	**0.0544**	**0.0147**	**3.8000e-004**	**0.0151**	**0.0000**	**83.7811**	**83.7811**	**1.1300e-003**	**0.0000**	**83.8092**

3.11 Dam Facilities - Main Dam - 2024

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					3.3604	0.0000	3.3604	0.9204	0.0000	0.9204	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.1782	10.5546	8.2058	0.0230		0.4384	0.4384		0.4041	0.4041	0.0000	2,014.2034	2,014.2034	0.6445	0.0000	2,030.3168
Total	**1.1782**	**10.5546**	**8.2058**	**0.0230**	**3.3604**	**0.4384**	**3.7988**	**0.9204**	**0.4041**	**1.3245**	**0.0000**	**2,014.2034**	**2,014.2034**	**0.6445**	**0.0000**	**2,030.3168**

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	8.0000e-005	2.0900e-003	5.6000e-004	1.0000e-005	2.6900e-003	1.0000e-005	2.6900e-003	6.7000e-004	1.0000e-005	6.8000e-004	0.0000	1.3575	1.3575	2.0000e-005	0.0000	1.3581
Vendor	3.4800e-003	0.0830	0.0220	6.1000e-004	0.0189	2.1000e-004	0.0192	5.4600e-003	2.0000e-004	5.6700e-003	0.0000	57.8444	57.8444	6.2000e-004	0.0000	57.8597
Worker	0.0104	6.8300e-003	0.0727	2.7000e-004	0.0323	1.9000e-004	0.0325	8.5900e-003	1.7000e-004	8.7600e-003	0.0000	24.5792	24.5792	4.9000e-004	0.0000	24.5914
Total	**0.0140**	**0.0919**	**0.0952**	**8.9000e-004**	**0.0540**	**4.1000e-004**	**0.0544**	**0.0147**	**3.8000e-004**	**0.0151**	**0.0000**	**83.7811**	**83.7811**	**1.1300e-003**	**0.0000**	**83.8092**

3.11 Dam Facilities - Main Dam - 2025

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					16.4555	0.0000	16.4555	6.9857	0.0000	6.9857	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.5938	38.9375	32.9227	0.0969		1.5958	1.5958		1.4715	1.4715	0.0000	8,476.163 3	8,476.163 3	2.7123	0.0000	8,543.971 5
Total	**4.5938**	**38.9375**	**32.9227**	**0.0969**	**16.4555**	**1.5958**	**18.0513**	**6.9857**	**1.4715**	**8.4572**	**0.0000**	**8,476.163 3**	**8,476.163 3**	**2.7123**	**0.0000**	**8,543.971 5**

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	3.5000e-004	8.5500e-003	2.3200e-003	6.0000e-005	2.9900e-003	2.0000e-005	3.0100e-003	7.8000e-004	2.0000e-005	8.0000e-004	0.0000	5.6824	5.6824	9.0000e-005	0.0000	5.6847
Vendor	0.0144	0.3433	0.0895	2.5500e-003	0.0797	8.8000e-004	0.0806	0.0230	8.4000e-004	0.0238	0.0000	242.3783	242.3783	2.5700e-003	0.0000	242.4425
Worker	0.0413	0.0260	0.2822	1.1000e-003	0.1361	7.8000e-004	0.1369	0.0362	7.2000e-004	0.0369	0.0000	99.3778	99.3778	1.8600e-003	0.0000	99.4242
Total	**0.0561**	**0.3778**	**0.3740**	**3.7100e-003**	**0.2188**	**1.6800e-003**	**0.2205**	**0.0599**	**1.5800e-003**	**0.0615**	**0.0000**	**347.4384**	**347.4384**	**4.5200e-003**	**0.0000**	**347.5514**

3.11 Dam Facilities - Main Dam - 2025

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					7.4050	0.0000	7.4050	3.1436	0.0000	3.1436	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.5938	38.9375	32.9226	0.0969		1.5958	1.5958		1.4715	1.4715	0.0000	8,476.153 2	8,476.153 2	2.7123	0.0000	8,543.961 3
Total	**4.5938**	**38.9375**	**32.9226**	**0.0969**	**7.4050**	**1.5958**	**9.0008**	**3.1436**	**1.4715**	**4.6151**	**0.0000**	**8,476.153 2**	**8,476.153 2**	**2.7123**	**0.0000**	**8,543.961 3**

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	3.5000e-004	8.5500e-003	2.3200e-003	6.0000e-005	2.9900e-003	2.0000e-005	3.0100e-003	7.8000e-004	2.0000e-005	8.0000e-004	0.0000	5.6824	5.6824	9.0000e-005	0.0000	5.6847
Vendor	0.0144	0.3433	0.0895	2.5500e-003	0.0797	8.8000e-004	0.0806	0.0230	8.4000e-004	0.0238	0.0000	242.3783	242.3783	2.5700e-003	0.0000	242.4425
Worker	0.0413	0.0260	0.2822	1.1000e-003	0.1361	7.8000e-004	0.1369	0.0362	7.2000e-004	0.0369	0.0000	99.3778	99.3778	1.8600e-003	0.0000	99.4242
Total	**0.0561**	**0.3778**	**0.3740**	**3.7100e-003**	**0.2188**	**1.6800e-003**	**0.2205**	**0.0599**	**1.5800e-003**	**0.0615**	**0.0000**	**347.4384**	**347.4384**	**4.5200e-003**	**0.0000**	**347.5514**

3.11 Dam Facilities - Main Dam - 2026

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					16.3200	0.0000	16.3200	6.9113	0.0000	6.9113	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.5410	38.4899	32.5442	0.0958		1.5775	1.5775		1.4546	1.4546	0.0000	8,378.7361	8,378.7361	2.6812	0.0000	8,445.7649
Total	**4.5410**	**38.4899**	**32.5442**	**0.0958**	**16.3200**	**1.5775**	**17.8975**	**6.9113**	**1.4546**	**8.3658**	**0.0000**	**8,378.7361**	**8,378.7361**	**2.6812**	**0.0000**	**8,445.7649**

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	3.4000e-004	8.2300e-003	2.2600e-003	6.0000e-005	2.9800e-003	2.0000e-005	3.0000e-003	7.8000e-004	2.0000e-005	8.0000e-004	0.0000	5.5886	5.5886	9.0000e-005	0.0000	5.5909
Vendor	0.0140	0.3331	0.0863	2.5100e-003	0.0788	8.7000e-004	0.0797	0.0227	8.3000e-004	0.0236	0.0000	238.5729	238.5729	2.5300e-003	0.0000	238.6361
Worker	0.0387	0.0235	0.2607	1.0500e-003	0.1345	7.5000e-004	0.1353	0.0358	6.9000e-004	0.0364	0.0000	94.8004	94.8004	1.6800e-003	0.0000	94.8424
Total	**0.0530**	**0.3648**	**0.3493**	**3.6200e-003**	**0.2163**	**1.6400e-003**	**0.2180**	**0.0593**	**1.5400e-003**	**0.0608**	**0.0000**	**338.9619**	**338.9619**	**4.3000e-003**	**0.0000**	**339.0694**

3.11 Dam Facilities - Main Dam - 2026

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					7.3440	0.0000	7.3440	3.1101	0.0000	3.1101	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.5410	38.4899	32.5442	0.0958		1.5775	1.5775		1.4546	1.4546	0.0000	8,378.7262	8,378.7262	2.6812	0.0000	8,445.7549
Total	**4.5410**	**38.4899**	**32.5442**	**0.0958**	**7.3440**	**1.5775**	**8.9215**	**3.1101**	**1.4546**	**4.5647**	**0.0000**	**8,378.7262**	**8,378.7262**	**2.6812**	**0.0000**	**8,445.7549**

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	3.4000e-004	8.2300e-003	2.2600e-003	6.0000e-005	2.9800e-003	2.0000e-005	3.0000e-003	7.8000e-004	2.0000e-005	8.0000e-004	0.0000	5.5886	5.5886	9.0000e-005	0.0000	5.5909
Vendor	0.0140	0.3331	0.0863	2.5100e-003	0.0788	8.7000e-004	0.0797	0.0227	8.3000e-004	0.0236	0.0000	238.5729	238.5729	2.5300e-003	0.0000	238.6361
Worker	0.0387	0.0235	0.2607	1.0500e-003	0.1345	7.5000e-004	0.1353	0.0358	6.9000e-004	0.0364	0.0000	94.8004	94.8004	1.6800e-003	0.0000	94.8424
Total	**0.0530**	**0.3648**	**0.3493**	**3.6200e-003**	**0.2163**	**1.6400e-003**	**0.2180**	**0.0593**	**1.5400e-003**	**0.0608**	**0.0000**	**338.9619**	**338.9619**	**4.3000e-003**	**0.0000**	**339.0694**

3.12 Dam Facilities - Outlet Works - 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					6.8000e-004	0.0000	6.8000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0114	0.0720	0.0389	1.2000e-004		2.6800e-003	2.6800e-003		2.6800e-003	2.6800e-003	0.0000	8.5690	8.5690	9.2000e-004	0.0000	8.5920
Total	**0.0114**	**0.0720**	**0.0389**	**1.2000e-004**	**6.8000e-004**	**2.6800e-003**	**3.3600e-003**	**1.0000e-004**	**2.6800e-003**	**2.7800e-003**	**0.0000**	**8.5690**	**8.5690**	**9.2000e-004**	**0.0000**	**8.5920**

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	7.0000e-005	2.0000e-005	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0476	0.0476	0.0000	0.0000	0.0476
Vendor	1.9300e-003	0.0461	0.0122	3.4000e-004	0.0105	1.2000e-004	0.0106	3.0400e-003	1.1000e-004	3.1500e-003	0.0000	32.1358	32.1358	3.4000e-004	0.0000	32.1443
Worker	6.7000e-004	4.4000e-004	4.6400e-003	2.0000e-005	2.0600e-003	1.0000e-005	2.0800e-003	5.5000e-004	1.0000e-005	5.6000e-004	0.0000	1.5689	1.5689	3.0000e-005	0.0000	1.5697
Total	**2.6000e-003**	**0.0466**	**0.0169**	**3.6000e-004**	**0.0127**	**1.3000e-004**	**0.0128**	**3.6100e-003**	**1.2000e-004**	**3.7300e-003**	**0.0000**	**33.7522**	**33.7522**	**3.7000e-004**	**0.0000**	**33.7615**

3.12 Dam Facilities - Outlet Works - 2024

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					3.1000e-004	0.0000	3.1000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0114	0.0720	0.0389	1.2000e-004		2.6800e-003	2.6800e-003		2.6800e-003	2.6800e-003	0.0000	8.5690	8.5690	9.2000e-004	0.0000	8.5920
Total	**0.0114**	**0.0720**	**0.0389**	**1.2000e-004**	**3.1000e-004**	**2.6800e-003**	**2.9900e-003**	**5.0000e-005**	**2.6800e-003**	**2.7300e-003**	**0.0000**	**8.5690**	**8.5690**	**9.2000e-004**	**0.0000**	**8.5920**

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	7.0000e-005	2.0000e-005	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0476	0.0476	0.0000	0.0000	0.0476
Vendor	1.9300e-003	0.0461	0.0122	3.4000e-004	0.0105	1.2000e-004	0.0106	3.0400e-003	1.1000e-004	3.1500e-003	0.0000	32.1358	32.1358	3.4000e-004	0.0000	32.1443
Worker	6.7000e-004	4.4000e-004	4.6400e-003	2.0000e-005	2.0600e-003	1.0000e-005	2.0800e-003	5.5000e-004	1.0000e-005	5.6000e-004	0.0000	1.5689	1.5689	3.0000e-005	0.0000	1.5697
Total	**2.6000e-003**	**0.0466**	**0.0169**	**3.6000e-004**	**0.0127**	**1.3000e-004**	**0.0128**	**3.6100e-003**	**1.2000e-004**	**3.7300e-003**	**0.0000**	**33.7522**	**33.7522**	**3.7000e-004**	**0.0000**	**33.7615**

3.12 Dam Facilities - Outlet Works - 2025

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					6.8000e-004	0.0000	6.8000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0479	0.3031	0.1637	4.9000e-004		0.0113	0.0113		0.0113	0.0113	0.0000	36.0729	36.0729	3.8700e-003	0.0000	36.1697
Total	**0.0479**	**0.3031**	**0.1637**	**4.9000e-004**	**6.8000e-004**	**0.0113**	**0.0120**	**1.0000e-004**	**0.0113**	**0.0114**	**0.0000**	**36.0729**	**36.0729**	**3.8700e-003**	**0.0000**	**36.1697**

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	1.0000e-005	3.0000e-004	8.0000e-005	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.1990	0.1990	0.0000	0.0000	0.1991
Vendor	8.0000e-003	0.1907	0.0497	1.4200e-003	0.0443	4.9000e-004	0.0448	0.0128	4.7000e-004	0.0133	0.0000	134.6546	134.6546	1.4300e-003	0.0000	134.6903
Worker	2.6400e-003	1.6600e-003	0.0180	7.0000e-005	8.6900e-003	5.0000e-005	8.7400e-003	2.3100e-003	5.0000e-005	2.3500e-003	0.0000	6.3433	6.3433	1.2000e-004	0.0000	6.3462
Total	**0.0107**	**0.1927**	**0.0678**	**1.4900e-003**	**0.0531**	**5.4000e-004**	**0.0536**	**0.0151**	**5.2000e-004**	**0.0156**	**0.0000**	**141.1969**	**141.1969**	**1.5500e-003**	**0.0000**	**141.2356**

3.12 Dam Facilities - Outlet Works - 2025

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					3.1000e-004	0.0000	3.1000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0479	0.3031	0.1637	4.9000e-004		0.0113	0.0113		0.0113	0.0113	0.0000	36.0729	36.0729	3.8700e-003	0.0000	36.1697
Total	**0.0479**	**0.3031**	**0.1637**	**4.9000e-004**	**3.1000e-004**	**0.0113**	**0.0116**	**5.0000e-005**	**0.0113**	**0.0113**	**0.0000**	**36.0729**	**36.0729**	**3.8700e-003**	**0.0000**	**36.1697**

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	1.0000e-005	3.0000e-004	8.0000e-005	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.1990	0.1990	0.0000	0.0000	0.1991
Vendor	8.0000e-003	0.1907	0.0497	1.4200e-003	0.0443	4.9000e-004	0.0448	0.0128	4.7000e-004	0.0133	0.0000	134.6546	134.6546	1.4300e-003	0.0000	134.6903
Worker	2.6400e-003	1.6600e-003	0.0180	7.0000e-005	8.6900e-003	5.0000e-005	8.7400e-003	2.3100e-003	5.0000e-005	2.3500e-003	0.0000	6.3433	6.3433	1.2000e-004	0.0000	6.3462
Total	**0.0107**	**0.1927**	**0.0678**	**1.4900e-003**	**0.0531**	**5.4000e-004**	**0.0536**	**0.0151**	**5.2000e-004**	**0.0156**	**0.0000**	**141.1969**	**141.1969**	**1.5500e-003**	**0.0000**	**141.2356**

3.12 Dam Facilities - Outlet Works - 2026

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					6.8000e-004	0.0000	6.8000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0253	0.1603	0.0865	2.6000e-004		5.9600e-003	5.9600e-003		5.9600e-003	5.9600e-003	0.0000	19.0730	19.0730	2.0500e-003	0.0000	19.1242
Total	**0.0253**	**0.1603**	**0.0865**	**2.6000e-004**	**6.8000e-004**	**5.9600e-003**	**6.6400e-003**	**1.0000e-004**	**5.9600e-003**	**6.0600e-003**	**0.0000**	**19.0730**	**19.0730**	**2.0500e-003**	**0.0000**	**19.1242**

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	1.0000e-005	1.5000e-004	4.0000e-005	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.1047	0.1047	0.0000	0.0000	0.1047
Vendor	4.1600e-003	0.0990	0.0257	7.5000e-004	0.0234	2.6000e-004	0.0237	6.7600e-003	2.5000e-004	7.0000e-003	0.0000	70.8938	70.8938	7.5000e-004	0.0000	70.9125
Worker	1.3200e-003	8.0000e-004	8.9000e-003	4.0000e-005	4.5900e-003	3.0000e-005	4.6200e-003	1.2200e-003	2.0000e-005	1.2400e-003	0.0000	3.2366	3.2366	6.0000e-005	0.0000	3.2381
Total	**5.4900e-003**	**0.0999**	**0.0346**	**7.9000e-004**	**0.0281**	**2.9000e-004**	**0.0284**	**8.0000e-003**	**2.7000e-004**	**8.2600e-003**	**0.0000**	**74.2351**	**74.2351**	**8.1000e-004**	**0.0000**	**74.2553**

3.12 Dam Facilities - Outlet Works - 2026

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					3.1000e-004	0.0000	3.1000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0253	0.1603	0.0865	2.6000e-004		5.9600e-003	5.9600e-003		5.9600e-003	5.9600e-003	0.0000	19.0730	19.0730	2.0500e-003	0.0000	19.1242
Total	**0.0253**	**0.1603**	**0.0865**	**2.6000e-004**	**3.1000e-004**	**5.9600e-003**	**6.2700e-003**	**5.0000e-005**	**5.9600e-003**	**6.0100e-003**	**0.0000**	**19.0730**	**19.0730**	**2.0500e-003**	**0.0000**	**19.1242**

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	1.0000e-005	1.5000e-004	4.0000e-005	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.1047	0.1047	0.0000	0.0000	0.1047
Vendor	4.1600e-003	0.0990	0.0257	7.5000e-004	0.0234	2.6000e-004	0.0237	6.7600e-003	2.5000e-004	7.0000e-003	0.0000	70.8938	70.8938	7.5000e-004	0.0000	70.9125
Worker	1.3200e-003	8.0000e-004	8.9000e-003	4.0000e-005	4.5900e-003	3.0000e-005	4.6200e-003	1.2200e-003	2.0000e-005	1.2400e-003	0.0000	3.2366	3.2366	6.0000e-005	0.0000	3.2381
Total	**5.4900e-003**	**0.0999**	**0.0346**	**7.9000e-004**	**0.0281**	**2.9000e-004**	**0.0284**	**8.0000e-003**	**2.7000e-004**	**8.2600e-003**	**0.0000**	**74.2351**	**74.2351**	**8.1000e-004**	**0.0000**	**74.2553**

3.13 Outlet Works PTs - 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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0129	0.1244	0.1555	2.4000e-004		6.4200e-003	6.4200e-003		5.9100e-003	5.9100e-003	0.0000	21.0303	21.0303	6.8000e-003	0.0000	21.2004
Total	**0.0129**	**0.1244**	**0.1555**	**2.4000e-004**	**0.0000**	**6.4200e-003**	**6.4200e-003**	**0.0000**	**5.9100e-003**	**5.9100e-003**	**0.0000**	**21.0303**	**21.0303**	**6.8000e-003**	**0.0000**	**21.2004**

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	6.7000e-004	4.4000e-004	4.6400e-003	2.0000e-005	2.0600e-003	1.0000e-005	2.0800e-003	5.5000e-004	1.0000e-005	5.6000e-004	0.0000	1.5689	1.5689	3.0000e-005	0.0000	1.5697
Total	**6.7000e-004**	**4.4000e-004**	**4.6400e-003**	**2.0000e-005**	**2.0600e-003**	**1.0000e-005**	**2.0800e-003**	**5.5000e-004**	**1.0000e-005**	**5.6000e-004**	**0.0000**	**1.5689**	**1.5689**	**3.0000e-005**	**0.0000**	**1.5697**

3.13 Outlet Works PTs - 2024

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0129	0.1244	0.1555	2.4000e-004		6.4200e-003	6.4200e-003		5.9100e-003	5.9100e-003	0.0000	21.0303	21.0303	6.8000e-003	0.0000	21.2004
Total	**0.0129**	**0.1244**	**0.1555**	**2.4000e-004**	**0.0000**	**6.4200e-003**	**6.4200e-003**	**0.0000**	**5.9100e-003**	**5.9100e-003**	**0.0000**	**21.0303**	**21.0303**	**6.8000e-003**	**0.0000**	**21.2004**

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	6.7000e-004	4.4000e-004	4.6400e-003	2.0000e-005	2.0600e-003	1.0000e-005	2.0800e-003	5.5000e-004	1.0000e-005	5.6000e-004	0.0000	1.5689	1.5689	3.0000e-005	0.0000	1.5697
Total	**6.7000e-004**	**4.4000e-004**	**4.6400e-003**	**2.0000e-005**	**2.0600e-003**	**1.0000e-005**	**2.0800e-003**	**5.5000e-004**	**1.0000e-005**	**5.6000e-004**	**0.0000**	**1.5689**	**1.5689**	**3.0000e-005**	**0.0000**	**1.5697**

3.13 Outlet Works PTs - 2025

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0488	0.4505	0.6519	1.0100e-003		0.0233	0.0233		0.0214	0.0214	0.0000	88.5872	88.5872	0.0287	0.0000	89.3035
Total	**0.0488**	**0.4505**	**0.6519**	**1.0100e-003**	**0.0000**	**0.0233**	**0.0233**	**0.0000**	**0.0214**	**0.0214**	**0.0000**	**88.5872**	**88.5872**	**0.0287**	**0.0000**	**89.3035**

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	2.6400e-003	1.6600e-003	0.0180	7.0000e-005	8.6900e-003	5.0000e-005	8.7400e-003	2.3100e-003	5.0000e-005	2.3500e-003	0.0000	6.3433	6.3433	1.2000e-004	0.0000	6.3462
Total	**2.6400e-003**	**1.6600e-003**	**0.0180**	**7.0000e-005**	**8.6900e-003**	**5.0000e-005**	**8.7400e-003**	**2.3100e-003**	**5.0000e-005**	**2.3500e-003**	**0.0000**	**6.3433**	**6.3433**	**1.2000e-004**	**0.0000**	**6.3462**

3.13 Outlet Works PTs - 2025

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0488	0.4505	0.6519	1.0100e-003		0.0233	0.0233		0.0214	0.0214	0.0000	88.5871	88.5871	0.0287	0.0000	89.3034
Total	**0.0488**	**0.4505**	**0.6519**	**1.0100e-003**	**0.0000**	**0.0233**	**0.0233**	**0.0000**	**0.0214**	**0.0214**	**0.0000**	**88.5871**	**88.5871**	**0.0287**	**0.0000**	**89.3034**

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	2.6400e-003	1.6600e-003	0.0180	7.0000e-005	8.6900e-003	5.0000e-005	8.7400e-003	2.3100e-003	5.0000e-005	2.3500e-003	0.0000	6.3433	6.3433	1.2000e-004	0.0000	6.3462
Total	**2.6400e-003**	**1.6600e-003**	**0.0180**	**7.0000e-005**	**8.6900e-003**	**5.0000e-005**	**8.7400e-003**	**2.3100e-003**	**5.0000e-005**	**2.3500e-003**	**0.0000**	**6.3433**	**6.3433**	**1.2000e-004**	**0.0000**	**6.3462**

3.13 Outlet Works PTs - 2026

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0488	0.4505	0.6519	1.0100e-003		0.0233	0.0233		0.0214	0.0214	0.0000	88.5872	88.5872	0.0287	0.0000	89.3035
Total	**0.0488**	**0.4505**	**0.6519**	**1.0100e-003**	**0.0000**	**0.0233**	**0.0233**	**0.0000**	**0.0214**	**0.0214**	**0.0000**	**88.5872**	**88.5872**	**0.0287**	**0.0000**	**89.3035**

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	2.5000e-003	1.5100e-003	0.0168	7.0000e-005	8.6900e-003	5.0000e-005	8.7400e-003	2.3100e-003	4.0000e-005	2.3500e-003	0.0000	6.1215	6.1215	1.1000e-004	0.0000	6.1242
Total	**2.5000e-003**	**1.5100e-003**	**0.0168**	**7.0000e-005**	**8.6900e-003**	**5.0000e-005**	**8.7400e-003**	**2.3100e-003**	**4.0000e-005**	**2.3500e-003**	**0.0000**	**6.1215**	**6.1215**	**1.1000e-004**	**0.0000**	**6.1242**

3.13 Outlet Works PTs - 2026

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0488	0.4505	0.6519	1.0100e-003		0.0233	0.0233		0.0214	0.0214	0.0000	88.5871	88.5871	0.0287	0.0000	89.3034
Total	**0.0488**	**0.4505**	**0.6519**	**1.0100e-003**	**0.0000**	**0.0233**	**0.0233**	**0.0000**	**0.0214**	**0.0214**	**0.0000**	**88.5871**	**88.5871**	**0.0287**	**0.0000**	**89.3034**

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	2.5000e-003	1.5100e-003	0.0168	7.0000e-005	8.6900e-003	5.0000e-005	8.7400e-003	2.3100e-003	4.0000e-005	2.3500e-003	0.0000	6.1215	6.1215	1.1000e-004	0.0000	6.1242
Total	**2.5000e-003**	**1.5100e-003**	**0.0168**	**7.0000e-005**	**8.6900e-003**	**5.0000e-005**	**8.7400e-003**	**2.3100e-003**	**4.0000e-005**	**2.3500e-003**	**0.0000**	**6.1215**	**6.1215**	**1.1000e-004**	**0.0000**	**6.1242**

3.13 Outlet Works PTs - 2027

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0480	0.4436	0.6419	9.9000e-004		0.0229	0.0229		0.0211	0.0211	0.0000	87.2296	87.2296	0.0282	0.0000	87.9349
Total	**0.0480**	**0.4436**	**0.6419**	**9.9000e-004**	**0.0000**	**0.0229**	**0.0229**	**0.0000**	**0.0211**	**0.0211**	**0.0000**	**87.2296**	**87.2296**	**0.0282**	**0.0000**	**87.9349**

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	2.3200e-003	1.3600e-003	0.0154	6.0000e-005	8.5500e-003	5.0000e-005	8.6000e-003	2.2700e-003	4.0000e-005	2.3100e-003	0.0000	5.8246	5.8246	1.0000e-004	0.0000	5.8270
Total	**2.3200e-003**	**1.3600e-003**	**0.0154**	**6.0000e-005**	**8.5500e-003**	**5.0000e-005**	**8.6000e-003**	**2.2700e-003**	**4.0000e-005**	**2.3100e-003**	**0.0000**	**5.8246**	**5.8246**	**1.0000e-004**	**0.0000**	**5.8270**

3.13 Outlet Works PTs - 2027

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0480	0.4436	0.6419	9.9000e-004		0.0229	0.0229		0.0211	0.0211	0.0000	87.2295	87.2295	0.0282	0.0000	87.9347
Total	**0.0480**	**0.4436**	**0.6419**	**9.9000e-004**	**0.0000**	**0.0229**	**0.0229**	**0.0000**	**0.0211**	**0.0211**	**0.0000**	**87.2295**	**87.2295**	**0.0282**	**0.0000**	**87.9347**

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	2.3200e-003	1.3600e-003	0.0154	6.0000e-005	8.5500e-003	5.0000e-005	8.6000e-003	2.2700e-003	4.0000e-005	2.3100e-003	0.0000	5.8246	5.8246	1.0000e-004	0.0000	5.8270
Total	**2.3200e-003**	**1.3600e-003**	**0.0154**	**6.0000e-005**	**8.5500e-003**	**5.0000e-005**	**8.6000e-003**	**2.2700e-003**	**4.0000e-005**	**2.3100e-003**	**0.0000**	**5.8246**	**5.8246**	**1.0000e-004**	**0.0000**	**5.8270**

3.14 Dam Facilities - Spillway - 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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0336	0.2534	0.5255	8.6000e-004		0.0121	0.0121		0.0112	0.0112	0.0000	74.6287	74.6287	0.0232	0.0000	75.2089
Total	**0.0336**	**0.2534**	**0.5255**	**8.6000e-004**	**0.0000**	**0.0121**	**0.0121**	**0.0000**	**0.0112**	**0.0112**	**0.0000**	**74.6287**	**74.6287**	**0.0232**	**0.0000**	**75.2089**

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	1.1600e-003	0.0277	7.3200e-003	2.0000e-004	6.3100e-003	7.0000e-005	6.3800e-003	1.8200e-003	7.0000e-005	1.8900e-003	0.0000	19.2815	19.2815	2.1000e-004	0.0000	19.2866
Worker	8.9000e-004	5.8000e-004	6.1800e-003	2.0000e-005	2.7500e-003	2.0000e-005	2.7700e-003	7.3000e-004	1.0000e-005	7.5000e-004	0.0000	2.0919	2.0919	4.0000e-005	0.0000	2.0929
Total	**2.0500e-003**	**0.0283**	**0.0135**	**2.2000e-004**	**9.0600e-003**	**9.0000e-005**	**9.1500e-003**	**2.5500e-003**	**8.0000e-005**	**2.6400e-003**	**0.0000**	**21.3733**	**21.3733**	**2.5000e-004**	**0.0000**	**21.3795**

3.14 Dam Facilities - Spillway - 2024

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0336	0.2534	0.5255	8.6000e-004		0.0121	0.0121		0.0112	0.0112	0.0000	74.6286	74.6286	0.0232	0.0000	75.2088
Total	**0.0336**	**0.2534**	**0.5255**	**8.6000e-004**	**0.0000**	**0.0121**	**0.0121**	**0.0000**	**0.0112**	**0.0112**	**0.0000**	**74.6286**	**74.6286**	**0.0232**	**0.0000**	**75.2088**

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	1.1600e-003	0.0277	7.3200e-003	2.0000e-004	6.3100e-003	7.0000e-005	6.3800e-003	1.8200e-003	7.0000e-005	1.8900e-003	0.0000	19.2815	19.2815	2.1000e-004	0.0000	19.2866
Worker	8.9000e-004	5.8000e-004	6.1800e-003	2.0000e-005	2.7500e-003	2.0000e-005	2.7700e-003	7.3000e-004	1.0000e-005	7.5000e-004	0.0000	2.0919	2.0919	4.0000e-005	0.0000	2.0929
Total	**2.0500e-003**	**0.0283**	**0.0135**	**2.2000e-004**	**9.0600e-003**	**9.0000e-005**	**9.1500e-003**	**2.5500e-003**	**8.0000e-005**	**2.6400e-003**	**0.0000**	**21.3733**	**21.3733**	**2.5000e-004**	**0.0000**	**21.3795**

3.14 Dam Facilities - Spillway - 2025

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1330	0.9487	2.2086	3.6200e-003		0.0447	0.0447		0.0416	0.0416	0.0000	314.2055	314.2055	0.0977	0.0000	316.6486
Total	**0.1330**	**0.9487**	**2.2086**	**3.6200e-003**	**0.0000**	**0.0447**	**0.0447**	**0.0000**	**0.0416**	**0.0416**	**0.0000**	**314.2055**	**314.2055**	**0.0977**	**0.0000**	**316.6486**

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	4.8000e-003	0.1144	0.0299	8.5000e-004	0.0266	2.9000e-004	0.0269	7.6700e-003	2.8000e-004	7.9500e-003	0.0000	80.7928	80.7928	8.6000e-004	0.0000	80.8142
Worker	3.5100e-003	2.2100e-003	0.0240	9.0000e-005	0.0116	7.0000e-005	0.0117	3.0800e-003	6.0000e-005	3.1400e-003	0.0000	8.4577	8.4577	1.6000e-004	0.0000	8.4616
Total	**8.3100e-003**	**0.1166**	**0.0539**	**9.4000e-004**	**0.0382**	**3.6000e-004**	**0.0385**	**0.0108**	**3.4000e-004**	**0.0111**	**0.0000**	**89.2504**	**89.2504**	**1.0200e-003**	**0.0000**	**89.2758**

3.14 Dam Facilities - Spillway - 2025

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1330	0.9487	2.2086	3.6200e-003		0.0447	0.0447		0.0416	0.0416	0.0000	314.2051	314.2051	0.0977	0.0000	316.6482
Total	**0.1330**	**0.9487**	**2.2086**	**3.6200e-003**	**0.0000**	**0.0447**	**0.0447**	**0.0000**	**0.0416**	**0.0416**	**0.0000**	**314.2051**	**314.2051**	**0.0977**	**0.0000**	**316.6482**

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	4.8000e-003	0.1144	0.0299	8.5000e-004	0.0266	2.9000e-004	0.0269	7.6700e-003	2.8000e-004	7.9500e-003	0.0000	80.7928	80.7928	8.6000e-004	0.0000	80.8142
Worker	3.5100e-003	2.2100e-003	0.0240	9.0000e-005	0.0116	7.0000e-005	0.0117	3.0800e-003	6.0000e-005	3.1400e-003	0.0000	8.4577	8.4577	1.6000e-004	0.0000	8.4616
Total	**8.3100e-003**	**0.1166**	**0.0539**	**9.4000e-004**	**0.0382**	**3.6000e-004**	**0.0385**	**0.0108**	**3.4000e-004**	**0.0111**	**0.0000**	**89.2504**	**89.2504**	**1.0200e-003**	**0.0000**	**89.2758**

3.14 Dam Facilities - Spillway - 2026

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1330	0.9487	2.2086	3.6200e-003		0.0447	0.0447		0.0416	0.0416	0.0000	314.2055	314.2055	0.0977	0.0000	316.6486
Total	**0.1330**	**0.9487**	**2.2086**	**3.6200e-003**	**0.0000**	**0.0447**	**0.0447**	**0.0000**	**0.0416**	**0.0416**	**0.0000**	**314.2055**	**314.2055**	**0.0977**	**0.0000**	**316.6486**

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	4.7200e-003	0.1123	0.0291	8.5000e-004	0.0266	2.9000e-004	0.0269	7.6700e-003	2.8000e-004	7.9500e-003	0.0000	80.4490	80.4490	8.5000e-004	0.0000	80.4703
Worker	3.3300e-003	2.0200e-003	0.0225	9.0000e-005	0.0116	6.0000e-005	0.0117	3.0800e-003	6.0000e-005	3.1400e-003	0.0000	8.1619	8.1619	1.4000e-004	0.0000	8.1656
Total	**8.0500e-003**	**0.1144**	**0.0516**	**9.4000e-004**	**0.0382**	**3.5000e-004**	**0.0385**	**0.0108**	**3.4000e-004**	**0.0111**	**0.0000**	**88.6109**	**88.6109**	**9.9000e-004**	**0.0000**	**88.6359**

3.14 Dam Facilities - Spillway - 2026

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1330	0.9487	2.2086	3.6200e-003		0.0447	0.0447		0.0416	0.0416	0.0000	314.2051	314.2051	0.0977	0.0000	316.6482
Total	**0.1330**	**0.9487**	**2.2086**	**3.6200e-003**	**0.0000**	**0.0447**	**0.0447**	**0.0000**	**0.0416**	**0.0416**	**0.0000**	**314.2051**	**314.2051**	**0.0977**	**0.0000**	**316.6482**

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	4.7200e-003	0.1123	0.0291	8.5000e-004	0.0266	2.9000e-004	0.0269	7.6700e-003	2.8000e-004	7.9500e-003	0.0000	80.4490	80.4490	8.5000e-004	0.0000	80.4703
Worker	3.3300e-003	2.0200e-003	0.0225	9.0000e-005	0.0116	6.0000e-005	0.0117	3.0800e-003	6.0000e-005	3.1400e-003	0.0000	8.1619	8.1619	1.4000e-004	0.0000	8.1656
Total	**8.0500e-003**	**0.1144**	**0.0516**	**9.4000e-004**	**0.0382**	**3.5000e-004**	**0.0385**	**0.0108**	**3.4000e-004**	**0.0111**	**0.0000**	**88.6109**	**88.6109**	**9.9000e-004**	**0.0000**	**88.6359**

3.14 Dam Facilities - Spillway - 2027

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0494	0.3526	0.8208	1.3400e-003		0.0166	0.0166		0.0155	0.0155	0.0000	116.7737	116.7737	0.0363	0.0000	117.6817
Total	**0.0494**	**0.3526**	**0.8208**	**1.3400e-003**	**0.0000**	**0.0166**	**0.0166**	**0.0000**	**0.0155**	**0.0155**	**0.0000**	**116.7737**	**116.7737**	**0.0363**	**0.0000**	**117.6817**

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	1.7300e-003	0.0409	0.0106	3.1000e-004	9.8700e-003	1.1000e-004	9.9800e-003	2.8500e-003	1.0000e-004	2.9500e-003	0.0000	29.7767	29.7767	3.2000e-004	0.0000	29.7846
Worker	1.1700e-003	6.9000e-004	7.7700e-003	3.0000e-005	4.3000e-003	2.0000e-005	4.3300e-003	1.1400e-003	2.0000e-005	1.1600e-003	0.0000	2.9312	2.9312	5.0000e-005	0.0000	2.9324
Total	**2.9000e-003**	**0.0416**	**0.0183**	**3.4000e-004**	**0.0142**	**1.3000e-004**	**0.0143**	**3.9900e-003**	**1.2000e-004**	**4.1100e-003**	**0.0000**	**32.7079**	**32.7079**	**3.7000e-004**	**0.0000**	**32.7170**

3.14 Dam Facilities - Spillway - 2027

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0494	0.3526	0.8208	1.3400e-003		0.0166	0.0166		0.0155	0.0155	0.0000	116.7735	116.7735	0.0363	0.0000	117.6815
Total	**0.0494**	**0.3526**	**0.8208**	**1.3400e-003**	**0.0000**	**0.0166**	**0.0166**	**0.0000**	**0.0155**	**0.0155**	**0.0000**	**116.7735**	**116.7735**	**0.0363**	**0.0000**	**117.6815**

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	1.7300e-003	0.0409	0.0106	3.1000e-004	9.8700e-003	1.1000e-004	9.9800e-003	2.8500e-003	1.0000e-004	2.9500e-003	0.0000	29.7767	29.7767	3.2000e-004	0.0000	29.7846
Worker	1.1700e-003	6.9000e-004	7.7700e-003	3.0000e-005	4.3000e-003	2.0000e-005	4.3300e-003	1.1400e-003	2.0000e-005	1.1600e-003	0.0000	2.9312	2.9312	5.0000e-005	0.0000	2.9324
Total	**2.9000e-003**	**0.0416**	**0.0183**	**3.4000e-004**	**0.0142**	**1.3000e-004**	**0.0143**	**3.9900e-003**	**1.2000e-004**	**4.1100e-003**	**0.0000**	**32.7079**	**32.7079**	**3.7000e-004**	**0.0000**	**32.7170**

3.15 Conveyance - Open Cut Trench - 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					4.8400e-003	0.0000	4.8400e-003	1.9300e-003	0.0000	1.9300e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.2300e-003	0.0333	0.0363	8.0000e-005		1.4100e-003	1.4100e-003		1.3500e-003	1.3500e-003	0.0000	6.6893	6.6893	1.4800e-003	0.0000	6.7263
Total	**4.2300e-003**	**0.0333**	**0.0363**	**8.0000e-005**	**4.8400e-003**	**1.4100e-003**	**6.2500e-003**	**1.9300e-003**	**1.3500e-003**	**3.2800e-003**	**0.0000**	**6.6893**	**6.6893**	**1.4800e-003**	**0.0000**	**6.7263**

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	1.0000e-005	1.9000e-004	5.0000e-005	0.0000	9.9000e-004	0.0000	9.9000e-004	2.4000e-004	0.0000	2.5000e-004	0.0000	0.1205	0.1205	0.0000	0.0000	0.1206
Vendor	1.0000e-004	2.3800e-003	6.3000e-004	2.0000e-005	5.4000e-004	1.0000e-005	5.5000e-004	1.6000e-004	1.0000e-005	1.6000e-004	0.0000	1.6586	1.6586	2.0000e-005	0.0000	1.6591
Worker	6.0000e-005	4.0000e-005	4.0000e-004	0.0000	1.8000e-004	0.0000	1.8000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.1350	0.1350	0.0000	0.0000	0.1350
Total	**1.7000e-004**	**2.6100e-003**	**1.0800e-003**	**2.0000e-005**	**1.7100e-003**	**1.0000e-005**	**1.7200e-003**	**4.5000e-004**	**1.0000e-005**	**4.6000e-004**	**0.0000**	**1.9141**	**1.9141**	**2.0000e-005**	**0.0000**	**1.9147**

3.15 Conveyance - Open Cut Trench - 2024

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					2.1800e-003	0.0000	2.1800e-003	8.7000e-004	0.0000	8.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.2300e-003	0.0333	0.0363	8.0000e-005		1.4100e-003	1.4100e-003		1.3500e-003	1.3500e-003	0.0000	6.6893	6.6893	1.4800e-003	0.0000	6.7263
Total	**4.2300e-003**	**0.0333**	**0.0363**	**8.0000e-005**	**2.1800e-003**	**1.4100e-003**	**3.5900e-003**	**8.7000e-004**	**1.3500e-003**	**2.2200e-003**	**0.0000**	**6.6893**	**6.6893**	**1.4800e-003**	**0.0000**	**6.7263**

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	1.0000e-005	1.9000e-004	5.0000e-005	0.0000	9.9000e-004	0.0000	9.9000e-004	2.4000e-004	0.0000	2.5000e-004	0.0000	0.1205	0.1205	0.0000	0.0000	0.1206
Vendor	1.0000e-004	2.3800e-003	6.3000e-004	2.0000e-005	5.4000e-004	1.0000e-005	5.5000e-004	1.6000e-004	1.0000e-005	1.6000e-004	0.0000	1.6586	1.6586	2.0000e-005	0.0000	1.6591
Worker	6.0000e-005	4.0000e-005	4.0000e-004	0.0000	1.8000e-004	0.0000	1.8000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.1350	0.1350	0.0000	0.0000	0.1350
Total	**1.7000e-004**	**2.6100e-003**	**1.0800e-003**	**2.0000e-005**	**1.7100e-003**	**1.0000e-005**	**1.7200e-003**	**4.5000e-004**	**1.0000e-005**	**4.6000e-004**	**0.0000**	**1.9141**	**1.9141**	**2.0000e-005**	**0.0000**	**1.9147**

3.15 Conveyance - Open Cut Trench - 2025

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					0.1208	0.0000	0.1208	0.0657	0.0000	0.0657	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1599	1.2274	1.4236	3.1100e-003		0.0499	0.0499		0.0478	0.0478	0.0000	264.2290	264.2290	0.0583	0.0000	265.6852
Total	**0.1599**	**1.2274**	**1.4236**	**3.1100e-003**	**0.1208**	**0.0499**	**0.1707**	**0.0657**	**0.0478**	**0.1135**	**0.0000**	**264.2290**	**264.2290**	**0.0583**	**0.0000**	**265.6852**

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	2.9000e-004	7.1200e-003	1.9300e-003	5.0000e-005	1.3100e-003	2.0000e-005	1.3300e-003	3.6000e-004	2.0000e-005	3.8000e-004	0.0000	4.7339	4.7339	8.0000e-005	0.0000	4.7358
Vendor	3.8700e-003	0.0924	0.0241	6.9000e-004	0.0215	2.4000e-004	0.0217	6.1900e-003	2.3000e-004	6.4100e-003	0.0000	65.2120	65.2120	6.9000e-004	0.0000	65.2293
Worker	2.1300e-003	1.3400e-003	0.0145	6.0000e-005	7.0100e-003	4.0000e-005	7.0500e-003	1.8600e-003	4.0000e-005	1.9000e-003	0.0000	5.1200	5.1200	1.0000e-004	0.0000	5.1224
Total	**6.2900e-003**	**0.1008**	**0.0406**	**8.0000e-004**	**0.0298**	**3.0000e-004**	**0.0301**	**8.4100e-003**	**2.9000e-004**	**8.6900e-003**	**0.0000**	**75.0659**	**75.0659**	**8.7000e-004**	**0.0000**	**75.0875**

3.15 Conveyance - Open Cut Trench - 2025

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					0.0544	0.0000	0.0544	0.0295	0.0000	0.0295	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1599	1.2274	1.4236	3.1100e-003		0.0499	0.0499		0.0478	0.0478	0.0000	264.2287	264.2287	0.0583	0.0000	265.6849
Total	**0.1599**	**1.2274**	**1.4236**	**3.1100e-003**	**0.0544**	**0.0499**	**0.1043**	**0.0295**	**0.0478**	**0.0774**	**0.0000**	**264.2287**	**264.2287**	**0.0583**	**0.0000**	**265.6849**

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	2.9000e-004	7.1200e-003	1.9300e-003	5.0000e-005	1.3100e-003	2.0000e-005	1.3300e-003	3.6000e-004	2.0000e-005	3.8000e-004	0.0000	4.7339	4.7339	8.0000e-005	0.0000	4.7358
Vendor	3.8700e-003	0.0924	0.0241	6.9000e-004	0.0215	2.4000e-004	0.0217	6.1900e-003	2.3000e-004	6.4100e-003	0.0000	65.2120	65.2120	6.9000e-004	0.0000	65.2293
Worker	2.1300e-003	1.3400e-003	0.0145	6.0000e-005	7.0100e-003	4.0000e-005	7.0500e-003	1.8600e-003	4.0000e-005	1.9000e-003	0.0000	5.1200	5.1200	1.0000e-004	0.0000	5.1224
Total	**6.2900e-003**	**0.1008**	**0.0406**	**8.0000e-004**	**0.0298**	**3.0000e-004**	**0.0301**	**8.4100e-003**	**2.9000e-004**	**8.6900e-003**	**0.0000**	**75.0659**	**75.0659**	**8.7000e-004**	**0.0000**	**75.0875**

3.16 Open Cut Trench PTs - 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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.2000e-004	6.0200e-003	7.5200e-003	1.0000e-005		3.1000e-004	3.1000e-004		2.9000e-004	2.9000e-004	0.0000	1.0176	1.0176	3.3000e-004	0.0000	1.0258
Total	**6.2000e-004**	**6.0200e-003**	**7.5200e-003**	**1.0000e-005**	**0.0000**	**3.1000e-004**	**3.1000e-004**	**0.0000**	**2.9000e-004**	**2.9000e-004**	**0.0000**	**1.0176**	**1.0176**	**3.3000e-004**	**0.0000**	**1.0258**

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	3.0000e-005	2.0000e-005	2.0000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0675	0.0675	0.0000	0.0000	0.0675
Total	**3.0000e-005**	**2.0000e-005**	**2.0000e-004**	**0.0000**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0675**	**0.0675**	**0.0000**	**0.0000**	**0.0675**

3.16 Open Cut Trench PTs - 2024

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.2000e-004	6.0200e-003	7.5200e-003	1.0000e-005		3.1000e-004	3.1000e-004		2.9000e-004	2.9000e-004	0.0000	1.0176	1.0176	3.3000e-004	0.0000	1.0258
Total	**6.2000e-004**	**6.0200e-003**	**7.5200e-003**	**1.0000e-005**	**0.0000**	**3.1000e-004**	**3.1000e-004**	**0.0000**	**2.9000e-004**	**2.9000e-004**	**0.0000**	**1.0176**	**1.0176**	**3.3000e-004**	**0.0000**	**1.0258**

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	3.0000e-005	2.0000e-005	2.0000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0675	0.0675	0.0000	0.0000	0.0675
Total	**3.0000e-005**	**2.0000e-005**	**2.0000e-004**	**0.0000**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0675**	**0.0675**	**0.0000**	**0.0000**	**0.0675**

3.16 Open Cut Trench PTs - 2025

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0732	0.6757	0.9778	1.5100e-003		0.0349	0.0349		0.0322	0.0322	0.0000	132.8808	132.8808	0.0430	0.0000	133.9552
Total	**0.0732**	**0.6757**	**0.9778**	**1.5100e-003**	**0.0000**	**0.0349**	**0.0349**	**0.0000**	**0.0322**	**0.0322**	**0.0000**	**132.8808**	**132.8808**	**0.0430**	**0.0000**	**133.9552**

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	3.5100e-003	2.2100e-003	0.0240	9.0000e-005	0.0116	7.0000e-005	0.0117	3.0800e-003	6.0000e-005	3.1400e-003	0.0000	8.4577	8.4577	1.6000e-004	0.0000	8.4616
Total	**3.5100e-003**	**2.2100e-003**	**0.0240**	**9.0000e-005**	**0.0116**	**7.0000e-005**	**0.0117**	**3.0800e-003**	**6.0000e-005**	**3.1400e-003**	**0.0000**	**8.4577**	**8.4577**	**1.6000e-004**	**0.0000**	**8.4616**

3.16 Open Cut Trench PTs - 2025

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0732	0.6757	0.9778	1.5100e-003		0.0349	0.0349		0.0322	0.0322	0.0000	132.8807	132.8807	0.0430	0.0000	133.9551
Total	**0.0732**	**0.6757**	**0.9778**	**1.5100e-003**	**0.0000**	**0.0349**	**0.0349**	**0.0000**	**0.0322**	**0.0322**	**0.0000**	**132.8807**	**132.8807**	**0.0430**	**0.0000**	**133.9551**

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	3.5100e-003	2.2100e-003	0.0240	9.0000e-005	0.0116	7.0000e-005	0.0117	3.0800e-003	6.0000e-005	3.1400e-003	0.0000	8.4577	8.4577	1.6000e-004	0.0000	8.4616
Total	**3.5100e-003**	**2.2100e-003**	**0.0240**	**9.0000e-005**	**0.0116**	**7.0000e-005**	**0.0117**	**3.0800e-003**	**6.0000e-005**	**3.1400e-003**	**0.0000**	**8.4577**	**8.4577**	**1.6000e-004**	**0.0000**	**8.4616**

3.16 Open Cut Trench PTs - 2026

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0107	0.0984	0.1424	2.2000e-004		5.0900e-003	5.0900e-003		4.6800e-003	4.6800e-003	0.0000	19.3466	19.3466	6.2600e-003	0.0000	19.5031
Total	**0.0107**	**0.0984**	**0.1424**	**2.2000e-004**	**0.0000**	**5.0900e-003**	**5.0900e-003**	**0.0000**	**4.6800e-003**	**4.6800e-003**	**0.0000**	**19.3466**	**19.3466**	**6.2600e-003**	**0.0000**	**19.5031**

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	4.8000e-004	2.9000e-004	3.2700e-003	1.0000e-005	1.6900e-003	1.0000e-005	1.7000e-003	4.5000e-004	1.0000e-005	4.6000e-004	0.0000	1.1883	1.1883	2.0000e-005	0.0000	1.1889
Total	**4.8000e-004**	**2.9000e-004**	**3.2700e-003**	**1.0000e-005**	**1.6900e-003**	**1.0000e-005**	**1.7000e-003**	**4.5000e-004**	**1.0000e-005**	**4.6000e-004**	**0.0000**	**1.1883**	**1.1883**	**2.0000e-005**	**0.0000**	**1.1889**

3.16 Open Cut Trench PTs - 2026

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0107	0.0984	0.1424	2.2000e-004		5.0900e-003	5.0900e-003		4.6800e-003	4.6800e-003	0.0000	19.3466	19.3466	6.2600e-003	0.0000	19.5030
Total	**0.0107**	**0.0984**	**0.1424**	**2.2000e-004**	**0.0000**	**5.0900e-003**	**5.0900e-003**	**0.0000**	**4.6800e-003**	**4.6800e-003**	**0.0000**	**19.3466**	**19.3466**	**6.2600e-003**	**0.0000**	**19.5030**

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	4.8000e-004	2.9000e-004	3.2700e-003	1.0000e-005	1.6900e-003	1.0000e-005	1.7000e-003	4.5000e-004	1.0000e-005	4.6000e-004	0.0000	1.1883	1.1883	2.0000e-005	0.0000	1.1889
Total	**4.8000e-004**	**2.9000e-004**	**3.2700e-003**	**1.0000e-005**	**1.6900e-003**	**1.0000e-005**	**1.7000e-003**	**4.5000e-004**	**1.0000e-005**	**4.6000e-004**	**0.0000**	**1.1883**	**1.1883**	**2.0000e-005**	**0.0000**	**1.1889**

3.17 Dam Facilities - Site Restoration - 2027

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					0.1074	0.0000	0.1074	0.0116	0.0000	0.0116	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1102	1.0487	0.6715	2.0100e-003		0.0360	0.0360		0.0338	0.0338	0.0000	170.9168	170.9168	0.0497	0.0000	172.1604
Total	**0.1102**	**1.0487**	**0.6715**	**2.0100e-003**	**0.1074**	**0.0360**	**0.1434**	**0.0116**	**0.0338**	**0.0453**	**0.0000**	**170.9168**	**170.9168**	**0.0497**	**0.0000**	**172.1604**

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	9.6000e-004	0.0228	5.8800e-003	1.7000e-004	5.5000e-003	6.0000e-005	5.5600e-003	1.5900e-003	6.0000e-005	1.6400e-003	0.0000	16.5767	16.5767	1.8000e-004	0.0000	16.5811
Worker	2.4400e-003	1.4300e-003	0.0162	7.0000e-005	8.9900e-003	5.0000e-005	9.0300e-003	2.3900e-003	4.0000e-005	2.4300e-003	0.0000	6.1192	6.1192	1.0000e-004	0.0000	6.1218
Total	**3.4000e-003**	**0.0242**	**0.0221**	**2.4000e-004**	**0.0145**	**1.1000e-004**	**0.0146**	**3.9800e-003**	**1.0000e-004**	**4.0700e-003**	**0.0000**	**22.6959**	**22.6959**	**2.8000e-004**	**0.0000**	**22.7029**

3.17 Dam Facilities - Site Restoration - 2027

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					0.0483	0.0000	0.0483	5.2200e-003	0.0000	5.2200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1102	1.0487	0.6715	2.0100e-003		0.0360	0.0360		0.0338	0.0338	0.0000	170.9166	170.9166	0.0497	0.0000	172.1602
Total	**0.1102**	**1.0487**	**0.6715**	**2.0100e-003**	**0.0483**	**0.0360**	**0.0843**	**5.2200e-003**	**0.0338**	**0.0390**	**0.0000**	**170.9166**	**170.9166**	**0.0497**	**0.0000**	**172.1602**

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	9.6000e-004	0.0228	5.8800e-003	1.7000e-004	5.5000e-003	6.0000e-005	5.5600e-003	1.5900e-003	6.0000e-005	1.6400e-003	0.0000	16.5767	16.5767	1.8000e-004	0.0000	16.5811
Worker	2.4400e-003	1.4300e-003	0.0162	7.0000e-005	8.9900e-003	5.0000e-005	9.0300e-003	2.3900e-003	4.0000e-005	2.4300e-003	0.0000	6.1192	6.1192	1.0000e-004	0.0000	6.1218
Total	**3.4000e-003**	**0.0242**	**0.0221**	**2.4000e-004**	**0.0145**	**1.1000e-004**	**0.0146**	**3.9800e-003**	**1.0000e-004**	**4.0700e-003**	**0.0000**	**22.6959**	**22.6959**	**2.8000e-004**	**0.0000**	**22.7029**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	3.7300e-003	0.0405	0.0428	2.8000e-004	0.0207	1.5000e-004	0.0209	5.5600e-003	1.4000e-004	5.7100e-003	0.0000	25.8853	25.8853	1.2000e-003	0.0000	25.9152
Unmitigated	3.7300e-003	0.0405	0.0428	2.8000e-004	0.0207	1.5000e-004	0.0209	5.5600e-003	1.4000e-004	5.7100e-003	0.0000	25.8853	25.8853	1.2000e-003	0.0000	25.9152

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Refrigerated Warehouse-No Rail	14.09	14.09	14.09	54,422	54,422
Total	14.09	14.09	14.09	54,422	54,422

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Refrigerated Warehouse-No Rail	14.70	6.60	6.60	59.00	0.00	41.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Refrigerated Warehouse-No Rail	0.537520	0.029773	0.176471	0.099171	0.012038	0.003953	0.020335	0.111406	0.001746	0.001309	0.004863	0.000878	0.000539

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	14,493.7974	14,493.7974	0.5321	0.1101	14,539.9024
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	14,493.7974	14,493.7974	0.5321	0.1101	14,539.9024
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Refrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Refrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Refrigerated Warehouse-No Rail	4.04473e +007	14,493.79 74	0.5321	0.1101	14,539.90 24
Total		**14,493.79 74**	**0.5321**	**0.1101**	**14,539.90 24**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Refrigerated Warehouse-No Rail	4.04473e +007	14,493.79 74	0.5321	0.1101	14,539.90 24
Total		**14,493.79 74**	**0.5321**	**0.1101**	**14,539.90 24**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0132	1.0600e-003	0.1171	1.0000e-005		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004	0.0000	0.2284	0.2284	5.9000e-004	0.0000	0.2432
Unmitigated	0.0132	1.0600e-003	0.1171	1.0000e-005		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004	0.0000	0.2284	0.2284	5.9000e-004	0.0000	0.2432

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	2.4500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0108	1.0600e-003	0.1171	1.0000e-005		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004	0.0000	0.2284	0.2284	5.9000e-004	0.0000	0.2432
Total	**0.0132**	**1.0600e-003**	**0.1171**	**1.0000e-005**		**4.2000e-004**	**4.2000e-004**		**4.2000e-004**	**4.2000e-004**	**0.0000**	**0.2284**	**0.2284**	**5.9000e-004**	**0.0000**	**0.2432**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	2.4500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0108	1.0600e-003	0.1171	1.0000e-005		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004	0.0000	0.2284	0.2284	5.9000e-004	0.0000	0.2432
Total	**0.0132**	**1.0600e-003**	**0.1171**	**1.0000e-005**		**4.2000e-004**	**4.2000e-004**		**4.2000e-004**	**4.2000e-004**	**0.0000**	**0.2284**	**0.2284**	**5.9000e-004**	**0.0000**	**0.2432**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Refrigerated Warehouse-No Rail	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Refrigerated Warehouse-No Rail	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Refrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Refrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Del Puerto Canyon Reservoir Draft EIR

San Joaquin Valley Unified APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Refrigerated Warehouse-No Rail	95,858.00	1000sqft	2,200.60	95,858,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	45
Climate Zone	3			**Operational Year**	2028
Utility Company	Turlock Irrigation District				
CO2 Intensity (lb/MWhr)	790	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Off-road Equipment - project data

Off-road Equipment - project data

Off-road Equipment - project data (tranmission lines phase assume 5,000-hp helo crane use)

Grading -

Vehicle Trips - Based on Del_Puerto_Canyon_Reservoir_TIA_Draft_8-16-19.pdf traffic study - 149 VMT/day change

Consumer Products - No consumer products

Area Coating - project data

Landscape Equipment - landscape equipment - 2 times per month

Energy Use - Based on estimated annual 40447020 kWh

Water And Wastewater - No operational water use

Solid Waste - No operational waste generation

Construction Off-road Equipment Mitigation - Standard fugitive dust control measures; 90% tier4 (round up)

Fleet Mix -

Architectural Coating - project data

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_EF_Nonresidential_Exterior	150	100
tblAreaCoating	Area_EF_Nonresidential_Interior	150	0
tblAreaCoating	Area_EF_Parking	150	0
tblAreaCoating	Area_EF_Residential_Exterior	150	0
tblAreaCoating	Area_EF_Residential_Interior	150	0
tblAreaCoating	Area_Nonresidential_Exterior	47929000	10581
tblAreaCoating	Area_Nonresidential_Interior	143787000	0
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	0	100
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	55.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	17.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	34.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	41.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	22.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	26.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final

tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	15,500.00	120.00
tblConstructionPhase	NumDays	6,000.00	720.00
tblConstructionPhase	NumDays	6,000.00	720.00
tblConstructionPhase	NumDays	6,000.00	200.00
tblConstructionPhase	NumDays	15,500.00	348.00
tblConstructionPhase	NumDays	6,000.00	120.00
tblConstructionPhase	NumDays	15,500.00	200.00
tblConstructionPhase	NumDays	6,000.00	770.00
tblConstructionPhase	NumDays	6,000.00	630.00
tblConstructionPhase	NumDays	6,000.00	580.00
tblConstructionPhase	NumDays	6,000.00	460.00
tblConstructionPhase	NumDays	6,000.00	840.00
tblConstructionPhase	NumDays	15,500.00	680.00
tblConstructionPhase	NumDays	6,000.00	80.00
tblConstructionPhase	NumDays	6,000.00	300.00
tblConstructionPhase	NumDays	15,500.00	80.00
tblEnergyUse	LightingElect	2.45	0.00
tblEnergyUse	NT24E	21.99	0.00
tblEnergyUse	T24E	0.47	0.42
tblEnergyUse	T24NG	0.15	0.00
tblGrading	AcresOfGrading	150.00	250.00
tblGrading	MaterialExported	0.00	12,044.00

tblGrading	MaterialExported	0.00	20,956.00
tblGrading	MaterialExported	0.00	5,300.00
tblGrading	MaterialExported	0.00	24,500.00
tblGrading	MaterialImported	0.00	4,175.00
tblGrading	MaterialImported	0.00	6,500.00
tblGrading	MaterialImported	0.00	297,000.00
tblGrading	MaterialImported	0.00	624,000.00
tblGrading	MaterialImported	0.00	9,240.00
tblLandscapeEquipment	NumberSummerDays	180	24
tblOffRoadEquipment	HorsePower	172.00	5,000.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	6.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	6.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	8.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	20.00

tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	20.00
tblOffRoadEquipment	UsageHours	8.00	20.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	20.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	20.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00

tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	20.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	20.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	20.00
tblOffRoadEquipment	UsageHours	8.00	20.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblSolidWaste	SolidWasteGenerationRate	90,106.52	0.00
tblTripsAndVMT	HaulingTripLength	20.00	75.00
tblTripsAndVMT	HaulingTripLength	20.00	75.00
tblTripsAndVMT	HaulingTripLength	20.00	75.00
tblTripsAndVMT	HaulingTripLength	20.00	75.00
tblTripsAndVMT	HaulingTripLength	20.00	75.00
tblTripsAndVMT	HaulingTripLength	20.00	75.00
tblTripsAndVMT	HaulingTripLength	20.00	75.00
tblTripsAndVMT	HaulingTripLength	20.00	75.00

tblTripsAndVMT	HaulingTripLength	20.00	75.00
tblTripsAndVMT	HaulingTripLength	20.00	75.00
tblTripsAndVMT	HaulingTripLength	20.00	75.00
tblTripsAndVMT	HaulingTripLength	20.00	75.00
tblTripsAndVMT	HaulingTripLength	20.00	75.00
tblTripsAndVMT	HaulingTripLength	20.00	75.00
tblTripsAndVMT	HaulingTripLength	20.00	75.00
tblTripsAndVMT	HaulingTripLength	20.00	75.00
tblTripsAndVMT	HaulingTripNumber	1,506.00	7.00
tblTripsAndVMT	HaulingTripNumber	2,620.00	7.00
tblTripsAndVMT	HaulingTripNumber	522.00	4.00
tblTripsAndVMT	HaulingTripNumber	813.00	6.00
tblTripsAndVMT	HaulingTripNumber	37,125.00	48.00
tblTripsAndVMT	HaulingTripNumber	78,000.00	108.00
tblTripsAndVMT	HaulingTripNumber	1,155.00	3.00
tblTripsAndVMT	HaulingTripNumber	3,063.00	41.00
tblTripsAndVMT	VendorTripLength	6.60	75.00
tblTripsAndVMT	VendorTripLength	6.60	75.00
tblTripsAndVMT	VendorTripLength	6.60	75.00
tblTripsAndVMT	VendorTripLength	6.60	75.00
tblTripsAndVMT	VendorTripLength	6.60	75.00
tblTripsAndVMT	VendorTripLength	6.60	75.00
tblTripsAndVMT	VendorTripLength	6.60	75.00
tblTripsAndVMT	VendorTripLength	6.60	75.00
tblTripsAndVMT	VendorTripLength	6.60	75.00
tblTripsAndVMT	VendorTripLength	6.60	75.00
tblTripsAndVMT	VendorTripLength	6.60	75.00

tblTripsAndVMT	VendorTripLength	6.60	75.00
tblTripsAndVMT	VendorTripLength	6.60	75.00
tblTripsAndVMT	VendorTripLength	6.60	75.00
tblTripsAndVMT	VendorTripLength	6.60	75.00
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tblTripsAndVMT	VendorTripNumber	0.00	3.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00
tblTripsAndVMT	VendorTripNumber	0.00	10.00
tblTripsAndVMT	VendorTripNumber	0.00	5.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	17.00
tblTripsAndVMT	VendorTripNumber	0.00	9.00
tblTripsAndVMT	VendorTripNumber	0.00	5.00
tblTripsAndVMT	VendorTripNumber	0.00	3.00
tblTripsAndVMT	VendorTripNumber	0.00	8.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	WorkerTripLength	16.80	30.00
tblTripsAndVMT	WorkerTripLength	16.80	30.00
tblTripsAndVMT	WorkerTripLength	16.80	30.00
tblTripsAndVMT	WorkerTripLength	16.80	30.00
tblTripsAndVMT	WorkerTripLength	16.80	30.00
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tblTripsAndVMT	WorkerTripLength	16.80	30.00
tblTripsAndVMT	WorkerTripLength	16.80	30.00
tblTripsAndVMT	WorkerTripLength	16.80	30.00
tblTripsAndVMT	WorkerTripLength	16.80	30.00

tblTripsAndVMT	WorkerTripLength	16.80	30.00
tblTripsAndVMT	WorkerTripLength	16.80	30.00
tblTripsAndVMT	WorkerTripLength	16.80	30.00
tblTripsAndVMT	WorkerTripLength	16.80	30.00
tblTripsAndVMT	WorkerTripLength	16.80	30.00
tblTripsAndVMT	WorkerTripNumber	73.00	37.00
tblTripsAndVMT	WorkerTripNumber	75.00	25.00
tblTripsAndVMT	WorkerTripNumber	25.00	13.00
tblTripsAndVMT	WorkerTripNumber	105.00	53.00
tblTripsAndVMT	WorkerTripNumber	20.00	10.00
tblTripsAndVMT	WorkerTripNumber	33.00	17.00
tblTripsAndVMT	WorkerTripNumber	78.00	39.00
tblTripsAndVMT	WorkerTripNumber	28.00	7.00
tblTripsAndVMT	WorkerTripNumber	78.00	39.00
tblTripsAndVMT	WorkerTripNumber	93.00	47.00
tblTripsAndVMT	WorkerTripNumber	5.00	3.00
tblTripsAndVMT	WorkerTripNumber	5.00	3.00
tblTripsAndVMT	WorkerTripNumber	8.00	4.00
tblTripsAndVMT	WorkerTripNumber	55.00	8.00
tblTripsAndVMT	WorkerTripNumber	8.00	4.00
tblTripsAndVMT	WorkerTripNumber	20.00	10.00
tblVehicleTrips	ST_TR	1.68	1.4695e-004
tblVehicleTrips	SU_TR	1.68	1.4695e-004
tblVehicleTrips	WD_TR	1.68	1.4695e-004
tblWater	IndoorWaterUseRate	22,167,162,500.00	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.8131	7.3463	7.4802	0.0133	2.0917	0.3562	2.4478	0.7068	0.3302	1.0370	0.0000	1,154.9791	1,154.9791	0.3246	0.0000	1,163.0932
2023	2.7931	26.8826	20.6672	0.0533	8.2143	1.1426	9.3569	3.7873	1.0528	4.8400	0.0000	4,690.6436	4,690.6436	1.4060	0.0000	4,725.7925
2024	5.8833	53.5696	44.7271	0.1241	17.2983	2.2083	19.5066	6.2480	2.0371	8.2851	0.0000	10,918.6650	10,918.6650	3.1696	0.0000	10,997.9047
2025	8.9902	74.2470	72.2373	0.2089	20.6133	2.9864	23.5998	8.3441	2.7609	11.1050	0.0000	18,339.7067	18,339.7067	5.3180	0.0000	18,472.6571
2026	7.3934	59.2279	58.5582	0.1727	16.9206	2.3688	19.2895	7.0746	2.1898	9.2644	0.0000	15,149.2282	15,149.2282	4.4798	0.0000	15,261.2232
2027	0.3638	3.0157	3.3052	8.4000e-003	0.1846	0.1179	0.3025	0.0300	0.1102	0.1402	0.0000	729.1428	729.1428	0.1956	0.0000	734.0321
Maximum	**8.9902**	**74.2470**	**72.2373**	**0.2089**	**20.6133**	**2.9864**	**23.5998**	**8.3441**	**2.7609**	**11.1050**	**0.0000**	**18,339.7067**	**18,339.7067**	**5.3180**	**0.0000**	**18,472.6571**

2.1 Overall Construction

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	0.2188	1.6083	8.4240	0.0133	0.9822	0.0424	1.0246	0.3292	0.0405	0.3697	0.0000	1,154.977 8	1,154.977 8	0.3246	0.0000	1,163.091 9
2023	0.8724	5.0701	26.3975	0.0533	3.8345	0.1779	4.0124	1.7416	0.1697	1.9113	0.0000	4,690.638 4	4,690.638 4	1.4060	0.0000	4,725.787 3
2024	1.8919	11.0741	58.1567	0.1241	8.1103	0.3585	8.4687	2.9013	0.3437	3.2449	0.0000	10,918.65 32	10,918.65 32	3.1696	0.0000	10,997.89 28
2025	3.0605	17.2652	95.6505	0.2089	9.7416	0.5463	10.2878	3.8836	0.5261	4.4097	0.0000	18,339.68 68	18,339.68 68	5.3180	0.0000	18,472.63 70
2026	2.5309	14.0354	78.3283	0.1727	7.9322	0.4505	8.3827	3.2715	0.4341	3.7057	0.0000	15,149.211 5	15,149.211 5	4.4798	0.0000	15,261.20 63
2027	0.1179	0.6628	3.9878	8.4000e-003	0.1135	0.0204	0.1339	0.0218	0.0198	0.0416	0.0000	729.1421	729.1421	0.1956	0.0000	734.0313
Maximum	**3.0605**	**17.2652**	**95.6505**	**0.2089**	**9.7416**	**0.5463**	**10.2878**	**3.8836**	**0.5261**	**4.4097**	**0.0000**	**18,339.68 68**	**18,339.68 68**	**5.3180**	**0.0000**	**18,472.63 70**

	ROG	NOx	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	**66.87**	**77.83**	**-30.91**	**0.00**	**52.98**	**82.62**	**56.63**	**53.61**	**81.91**	**60.54**	**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	**1-3-2022**	**4-2-2022**	3.6351	0.8378
2	**4-3-2022**	**7-2-2022**	3.1872	0.7317
4	**10-3-2022**	**1-2-2023**	1.3586	0.2630
5	**1-3-2023**	**4-2-2023**	3.7430	0.7431
6	**4-3-2023**	**7-2-2023**	5.7195	1.1396

7	**7-3-2023**	**10-2-2023**	10.1946	2.0460
8	**10-3-2023**	**1-2-2024**	10.1912	2.0520
9	**1-3-2024**	**4-2-2024**	8.6126	1.7765
10	**4-3-2024**	**7-2-2024**	9.3284	1.9224
11	**7-3-2024**	**10-2-2024**	15.4223	3.3771
12	**10-3-2024**	**1-2-2025**	26.1314	5.9133
13	**1-3-2025**	**4-2-2025**	24.2589	5.8649
14	**4-3-2025**	**7-2-2025**	21.9829	5.3164
15	**7-3-2025**	**10-2-2025**	19.5985	4.7983
16	**10-3-2025**	**1-2-2026**	17.1460	4.2806
17	**1-3-2026**	**4-2-2026**	16.6855	4.1613
18	**4-3-2026**	**7-2-2026**	16.7424	4.1641
19	**7-3-2026**	**10-2-2026**	16.8064	4.1598
20	**10-3-2026**	**1-2-2027**	16.2059	4.0320
21	**1-3-2027**	**4-2-2027**	1.2705	0.3336
22	**4-3-2027**	**7-2-2027**	1.1198	0.2407
23	**7-3-2027**	**9-30-2027**	0.8140	0.1651
		Highest	26.1314	5.9133

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0132	1.0600e-003	0.1171	1.0000e-005		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004	0.0000	0.2284	0.2284	5.9000e-004	0.0000	0.2432
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	14,493.7974	14,493.7974	0.5321	0.1101	14,539.9024
Mobile	3.7300e-003	0.0405	0.0428	2.8000e-004	0.0207	1.5000e-004	0.0209	5.5600e-003	1.4000e-004	5.7100e-003	0.0000	25.8853	25.8853	1.2000e-003	0.0000	25.9152
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0170**	**0.0415**	**0.1599**	**2.9000e-004**	**0.0207**	**5.7000e-004**	**0.0213**	**5.5600e-003**	**5.6000e-004**	**6.1300e-003**	**0.0000**	**14,519.9111**	**14,519.9111**	**0.5338**	**0.1101**	**14,566.0608**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0132	1.0600e-003	0.1171	1.0000e-005		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004	0.0000	0.2284	0.2284	5.9000e-004	0.0000	0.2432
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	14,493.7974	14,493.7974	0.5321	0.1101	14,539.9024
Mobile	3.7300e-003	0.0405	0.0428	2.8000e-004	0.0207	1.5000e-004	0.0209	5.5600e-003	1.4000e-004	5.7100e-003	0.0000	25.8853	25.8853	1.2000e-003	0.0000	25.9152
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0170**	**0.0415**	**0.1599**	**2.9000e-004**	**0.0207**	**5.7000e-004**	**0.0213**	**5.5600e-003**	**5.6000e-004**	**6.1300e-003**	**0.0000**	**14,519.9111**	**14,519.9111**	**0.5338**	**0.1101**	**14,566.0608**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Utilities - Petroleum Pipeline	Grading	1/3/2022	6/20/2022	5	120	Utilities - Petroleum Pipeline
2	Utilities - Transmission Lines (to be scaled)	Site Preparation	12/5/2022	9/8/2025	5	720	Transmission line construction to be scaled by ratio of actual construction days to modeled days
3	Transmission Lines PTs	Site Preparation	12/5/2022	9/5/2025	5	720	pickup trucks used during Transmission Line phase
4	Roadway - Excavation	Site Preparation	6/5/2023	3/11/2024	5	200	Roadway - Excavation
5	Roadway - Grading and Paving	Grading	3/11/2024	7/10/2025	5	348	Roadway - Grading and Paving
6	Dam Facilities - Site Preparation	Site Preparation	4/22/2024	10/7/2024	5	120	Dam Facilities - Site Preparation
7	Pumping Plant	Grading	6/17/2024	3/24/2025	5	200	Pumping Plant
8	Tunneling - Outlet and Conveyance	Site Preparation	7/15/2024	6/28/2027	5	770	Tunneling - Outlet and Conveyance
9	Dam Facilities - Saddle Dams	Site Preparation	8/12/2024	1/11/2027	5	630	Dam Facilities - Saddle Dams
10	Dam Facilities - Main Dam	Site Preparation	10/7/2024	12/28/2026	5	580	Dam Facilities - Main Dam
11	Dam Facilities - Outlet Works	Site Preparation	10/7/2024	7/13/2026	5	460	Dam Facilities - Outlet Works
12	Outlet Works PTs	Site Preparation	10/7/2024	12/27/2027	5	840	pickup trucks used during Outlet Works phase
13	Dam Facilities - Spillway	Grading	10/7/2024	5/17/2027	5	680	Dam Facilities - Spillway
14	Conveyance - Open Cut Trench	Site Preparation	12/30/2024	4/21/2025	5	80	Conveyance - Open Cut Trench
15	Open Cut Trench PTs	Site Preparation	12/30/2024	2/23/2026	5	300	pickup trucks used during Open Cut Trench phase
16	Dam Facilities - Site Restoration	Grading	5/17/2027	9/6/2027	5	80	Dam Facilities - Site Restoration

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Utilities - Petroleum Pipeline	Aerial Lifts	0	0.00	63	0.31
Utilities - Petroleum Pipeline	Air Compressors	0	0.00	78	0.48
Utilities - Petroleum Pipeline	Bore/Drill Rigs	0	0.00	221	0.50
Utilities - Petroleum Pipeline	Cement and Mortar Mixers	0	0.00	9	0.56
Utilities - Petroleum Pipeline	Concrete/Industrial Saws	0	0.00	81	0.73
Utilities - Petroleum Pipeline	Cranes	0	0.00	231	0.29
Utilities - Petroleum Pipeline	Crawler Tractors	0	0.00	212	0.43
Utilities - Petroleum Pipeline	Crushing/Proc. Equipment	0	0.00	85	0.78
Utilities - Petroleum Pipeline	Dumpers/Tenders	0	0.00	16	0.38
Utilities - Petroleum Pipeline	Excavators	2	10.00	158	0.38
Utilities - Petroleum Pipeline	Forklifts	0	0.00	89	0.20
Utilities - Petroleum Pipeline	Generator Sets	0	0.00	84	0.74
Utilities - Petroleum Pipeline	Graders	0	0.00	187	0.41
Utilities - Petroleum Pipeline	Off-Highway Tractors	0	0.00	124	0.44
Utilities - Petroleum Pipeline	Off-Highway Trucks	0	0.00	402	0.38
Utilities - Petroleum Pipeline	Other Construction Equipment	8	10.00	172	0.42
Utilities - Petroleum Pipeline	Other General Industrial Equipment	0	0.00	88	0.34
Utilities - Petroleum Pipeline	Other Material Handling Equipment	6	10.00	168	0.40
Utilities - Petroleum Pipeline	Pavers	1	10.00	130	0.42
Utilities - Petroleum Pipeline	Paving Equipment	0	0.00	132	0.36
Utilities - Petroleum Pipeline	Plate Compactors	2	10.00	8	0.43
Utilities - Petroleum Pipeline	Pressure Washers	0	0.00	13	0.30
Utilities - Petroleum Pipeline	Pumps	0	0.00	84	0.74
Utilities - Petroleum Pipeline	Rollers	0	0.00	80	0.38
Utilities - Petroleum Pipeline	Rough Terrain Forklifts	0	0.00	100	0.40
Utilities - Petroleum Pipeline	Rubber Tired Dozers	2	10.00	247	0.40

Utilities - Petroleum Pipeline	Rubber Tired Loaders	0	0.00	203	0.36
Utilities - Petroleum Pipeline	Scrapers	0	0.00	367	0.48
Utilities - Petroleum Pipeline	Signal Boards	0	0.00	6	0.82
Utilities - Petroleum Pipeline	Skid Steer Loaders	0	0.00	65	0.37
Utilities - Petroleum Pipeline	Surfacing Equipment	0	0.00	263	0.30
Utilities - Petroleum Pipeline	Sweepers/Scrubbers	0	0.00	64	0.46
Utilities - Petroleum Pipeline	Tractors/Loaders/Backhoes	2	10.00	97	0.37
Utilities - Petroleum Pipeline	Trenchers	0	0.00	78	0.50
Utilities - Petroleum Pipeline	Welders	6	10.00	46	0.45
Utilities - Transmission Lines (to be scaled)	Aerial Lifts	0	0.00	63	0.31
Utilities - Transmission Lines (to be scaled)	Air Compressors	0	0.00	78	0.48
Utilities - Transmission Lines (to be scaled)	Bore/Drill Rigs	2	8.00	221	0.50
Utilities - Transmission Lines (to be scaled)	Cement and Mortar Mixers	0	0.00	9	0.56
Utilities - Transmission Lines (to be scaled)	Concrete/Industrial Saws	0	0.00	81	0.73
Utilities - Transmission Lines (to be scaled)	Cranes	5	8.00	231	0.29
Utilities - Transmission Lines (to be scaled)	Crawler Tractors	0	0.00	212	0.43
Utilities - Transmission Lines (to be scaled)	Crushing/Proc. Equipment	0	0.00	85	0.78
Utilities - Transmission Lines (to be scaled)	Dumpers/Tenders	2	10.00	16	0.38
Utilities - Transmission Lines (to be scaled)	Excavators	0	0.00	158	0.38
Utilities - Transmission Lines (to be scaled)	Forklifts	0	0.00	89	0.20
Utilities - Transmission Lines (to be scaled)	Generator Sets	0	0.00	84	0.74
Utilities - Transmission Lines (to be scaled)	Graders	4	10.00	187	0.41
Utilities - Transmission Lines (to be scaled)	Off-Highway Tractors	0	0.00	124	0.44
Utilities - Transmission Lines (to be scaled)	Off-Highway Trucks	0	0.00	402	0.38

Utilities - Transmission Lines (to be scaled)	Other Construction Equipment	10	8.00	5000	0.42
Utilities - Transmission Lines (to be scaled)	Other Construction Equipment	5	10.00	172	0.42
Utilities - Transmission Lines (to be scaled)	Other General Industrial Equipment	0	0.00	88	0.34
Utilities - Transmission Lines (to be scaled)	Other Material Handling Equipment	0	0.00	168	0.40
Utilities - Transmission Lines (to be scaled)	Pavers	0	0.00	130	0.42
Utilities - Transmission Lines (to be scaled)	Paving Equipment	0	0.00	132	0.36
Utilities - Transmission Lines (to be scaled)	Plate Compactors	0	0.00	8	0.43
Utilities - Transmission Lines (to be scaled)	Pressure Washers	0	0.00	13	0.30
Utilities - Transmission Lines (to be scaled)	Pumps	0	0.00	84	0.74
Utilities - Transmission Lines (to be scaled)	Rollers	0	0.00	80	0.38
Utilities - Transmission Lines (to be scaled)	Rough Terrain Forklifts	0	0.00	100	0.40
Utilities - Transmission Lines (to be scaled)	Rubber Tired Dozers	2	10.00	247	0.40
Utilities - Transmission Lines (to be scaled)	Rubber Tired Loaders	0	0.00	203	0.36
Utilities - Transmission Lines (to be scaled)	Scrapers	0	0.00	367	0.48
Utilities - Transmission Lines (to be scaled)	Signal Boards	0	0.00	6	0.82
Utilities - Transmission Lines (to be scaled)	Skid Steer Loaders	0	0.00	65	0.37
Utilities - Transmission Lines (to be scaled)	Surfacing Equipment	0	0.00	263	0.30
Utilities - Transmission Lines (to be scaled)	Sweepers/Scrubbers	0	0.00	64	0.46
Utilities - Transmission Lines (to be scaled)	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Utilities - Transmission Lines (to be scaled)	Trenchers	0	0.00	78	0.50
Utilities - Transmission Lines (to be scaled)	Welders	0	0.00	46	0.45
Transmission Lines PTs	Aerial Lifts	0	0.00	63	0.31

Transmission Lines PTs	Air Compressors	0	0.00	78	0.48
Transmission Lines PTs	Bore/Drill Rigs	0	0.00	221	0.50
Transmission Lines PTs	Cement and Mortar Mixers	0	0.00	9	0.56
Transmission Lines PTs	Concrete/Industrial Saws	0	0.00	81	0.73
Transmission Lines PTs	Cranes	0	0.00	231	0.29
Transmission Lines PTs	Crawler Tractors	0	0.00	212	0.43
Transmission Lines PTs	Crushing/Proc. Equipment	0	0.00	85	0.78
Transmission Lines PTs	Dumpers/Tenders	0	0.00	16	0.38
Transmission Lines PTs	Excavators	0	0.00	158	0.38
Transmission Lines PTs	Forklifts	0	0.00	89	0.20
Transmission Lines PTs	Generator Sets	0	0.00	84	0.74
Transmission Lines PTs	Graders	0	0.00	187	0.41
Transmission Lines PTs	Off-Highway Tractors	0	0.00	124	0.44
Transmission Lines PTs	Off-Highway Trucks	0	0.00	402	0.38
Transmission Lines PTs	Other Construction Equipment	10	4.00	172	0.42
Transmission Lines PTs	Other General Industrial Equipment	0	0.00	88	0.34
Transmission Lines PTs	Other Material Handling Equipment	0	0.00	168	0.40
Transmission Lines PTs	Pavers	0	0.00	130	0.42
Transmission Lines PTs	Paving Equipment	0	0.00	132	0.36
Transmission Lines PTs	Plate Compactors	0	0.00	8	0.43
Transmission Lines PTs	Pressure Washers	0	0.00	13	0.30
Transmission Lines PTs	Pumps	0	0.00	84	0.74
Transmission Lines PTs	Rollers	0	0.00	80	0.38
Transmission Lines PTs	Rough Terrain Forklifts	0	0.00	100	0.40
Transmission Lines PTs	Rubber Tired Dozers	0	0.00	247	0.40
Transmission Lines PTs	Rubber Tired Loaders	0	0.00	203	0.36
Transmission Lines PTs	Scrapers	0	0.00	367	0.48

Transmission Lines PTs	Signal Boards	0	0.00	6	0.82
Transmission Lines PTs	Skid Steer Loaders	0	0.00	65	0.37
Transmission Lines PTs	Surfacing Equipment	0	0.00	263	0.30
Transmission Lines PTs	Sweepers/Scrubbers	0	0.00	64	0.46
Transmission Lines PTs	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Transmission Lines PTs	Trenchers	0	0.00	78	0.50
Transmission Lines PTs	Welders	0	0.00	46	0.45
Roadway - Excavation	Aerial Lifts	0	0.00	63	0.31
Roadway - Excavation	Air Compressors	0	0.00	78	0.48
Roadway - Excavation	Bore/Drill Rigs	0	0.00	221	0.50
Roadway - Excavation	Cement and Mortar Mixers	0	0.00	9	0.56
Roadway - Excavation	Concrete/Industrial Saws	0	0.00	81	0.73
Roadway - Excavation	Cranes	0	0.00	231	0.29
Roadway - Excavation	Crawler Tractors	0	0.00	212	0.43
Roadway - Excavation	Crushing/Proc. Equipment	0	0.00	85	0.78
Roadway - Excavation	Dumpers/Tenders	8	10.00	16	0.38
Roadway - Excavation	Excavators	8	10.00	158	0.38
Roadway - Excavation	Forklifts	0	0.00	89	0.20
Roadway - Excavation	Generator Sets	0	0.00	84	0.74
Roadway - Excavation	Graders	0	0.00	187	0.41
Roadway - Excavation	Off-Highway Tractors	0	0.00	124	0.44
Roadway - Excavation	Off-Highway Trucks	8	10.00	402	0.38
Roadway - Excavation	Other Construction Equipment	0	0.00	172	0.42
Roadway - Excavation	Other General Industrial Equipment	0	0.00	88	0.34
Roadway - Excavation	Other Material Handling Equipment	0	0.00	168	0.40
Roadway - Excavation	Pavers	0	0.00	130	0.42
Roadway - Excavation	Paving Equipment	0	0.00	132	0.36

Roadway - Excavation	Plate Compactors	0	0.00	8	0.43
Roadway - Excavation	Pressure Washers	0	0.00	13	0.30
Roadway - Excavation	Pumps	0	0.00	84	0.74
Roadway - Excavation	Rollers	0	0.00	80	0.38
Roadway - Excavation	Rough Terrain Forklifts	0	0.00	100	0.40
Roadway - Excavation	Rubber Tired Dozers	8	10.00	247	0.40
Roadway - Excavation	Rubber Tired Loaders	0	0.00	203	0.36
Roadway - Excavation	Scrapers	4	10.00	367	0.48
Roadway - Excavation	Signal Boards	0	0.00	6	0.82
Roadway - Excavation	Skid Steer Loaders	0	0.00	65	0.37
Roadway - Excavation	Surfacing Equipment	0	0.00	263	0.30
Roadway - Excavation	Sweepers/Scrubbers	0	0.00	64	0.46
Roadway - Excavation	Tractors/Loaders/Backhoes	6	5.00	97	0.37
Roadway - Excavation	Trenchers	0	0.00	78	0.50
Roadway - Excavation	Welders	0	0.00	46	0.45
Roadway - Grading and Paving	Aerial Lifts	0	0.00	63	0.31
Roadway - Grading and Paving	Air Compressors	0	0.00	78	0.48
Roadway - Grading and Paving	Bore/Drill Rigs	0	0.00	221	0.50
Roadway - Grading and Paving	Cement and Mortar Mixers	0	0.00	9	0.56
Roadway - Grading and Paving	Concrete/Industrial Saws	0	0.00	81	0.73
Roadway - Grading and Paving	Cranes	1	20.00	231	0.29
Roadway - Grading and Paving	Crawler Tractors	0	0.00	212	0.43
Roadway - Grading and Paving	Crushing/Proc. Equipment	0	0.00	85	0.78
Roadway - Grading and Paving	Dumpers/Tenders	0	0.00	16	0.38
Roadway - Grading and Paving	Excavators	0	0.00	158	0.38
Roadway - Grading and Paving	Forklifts	0	0.00	89	0.20
Roadway - Grading and Paving	Generator Sets	0	0.00	84	0.74

Roadway - Grading and Paving	Graders	2	20.00	187	0.41
Roadway - Grading and Paving	Off-Highway Tractors	0	0.00	124	0.44
Roadway - Grading and Paving	Off-Highway Trucks	0	0.00	402	0.38
Roadway - Grading and Paving	Other Construction Equipment	0	0.00	172	0.42
Roadway - Grading and Paving	Other General Industrial Equipment	0	0.00	88	0.34
Roadway - Grading and Paving	Other Material Handling Equipment	0	0.00	168	0.40
Roadway - Grading and Paving	Pavers	1	20.00	130	0.42
Roadway - Grading and Paving	Paving Equipment	0	0.00	132	0.36
Roadway - Grading and Paving	Plate Compactors	0	0.00	8	0.43
Roadway - Grading and Paving	Pressure Washers	0	0.00	13	0.30
Roadway - Grading and Paving	Pumps	0	0.00	84	0.74
Roadway - Grading and Paving	Rollers	4	20.00	80	0.38
Roadway - Grading and Paving	Rough Terrain Forklifts	0	0.00	100	0.40
Roadway - Grading and Paving	Rubber Tired Dozers	0	0.00	247	0.40
Roadway - Grading and Paving	Rubber Tired Loaders	0	0.00	203	0.36
Roadway - Grading and Paving	Scrapers	0	0.00	367	0.48
Roadway - Grading and Paving	Signal Boards	0	0.00	6	0.82
Roadway - Grading and Paving	Skid Steer Loaders	0	0.00	65	0.37
Roadway - Grading and Paving	Surfacing Equipment	0	0.00	263	0.30
Roadway - Grading and Paving	Sweepers/Scrubbers	0	0.00	64	0.46
Roadway - Grading and Paving	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Roadway - Grading and Paving	Trenchers	0	0.00	78	0.50
Roadway - Grading and Paving	Welders	0	0.00	46	0.45
Dam Facilities - Site Preparation	Aerial Lifts	0	0.00	63	0.31
Dam Facilities - Site Preparation	Air Compressors	0	0.00	78	0.48
Dam Facilities - Site Preparation	Bore/Drill Rigs	0	0.00	221	0.50
Dam Facilities - Site Preparation	Cement and Mortar Mixers	0	0.00	9	0.56

Dam Facilities - Site Preparation	Concrete/Industrial Saws	0	0.00	81	0.73
Dam Facilities - Site Preparation	Cranes	0	0.00	231	0.29
Dam Facilities - Site Preparation	Crawler Tractors	0	0.00	212	0.43
Dam Facilities - Site Preparation	Crushing/Proc. Equipment	0	0.00	85	0.78
Dam Facilities - Site Preparation	Dumpers/Tenders	1	20.00	16	0.38
Dam Facilities - Site Preparation	Excavators	0	0.00	158	0.38
Dam Facilities - Site Preparation	Forklifts	0	0.00	89	0.20
Dam Facilities - Site Preparation	Generator Sets	0	0.00	84	0.74
Dam Facilities - Site Preparation	Graders	1	20.00	187	0.41
Dam Facilities - Site Preparation	Off-Highway Tractors	0	0.00	124	0.44
Dam Facilities - Site Preparation	Off-Highway Trucks	3	20.00	402	0.38
Dam Facilities - Site Preparation	Other Construction Equipment	1	20.00	172	0.42
Dam Facilities - Site Preparation	Other General Industrial Equipment	0	0.00	88	0.34
Dam Facilities - Site Preparation	Other Material Handling Equipment	0	0.00	168	0.40
Dam Facilities - Site Preparation	Pavers	0	0.00	130	0.42
Dam Facilities - Site Preparation	Paving Equipment	0	0.00	132	0.36
Dam Facilities - Site Preparation	Plate Compactors	1	20.00	8	0.43
Dam Facilities - Site Preparation	Pressure Washers	0	0.00	13	0.30
Dam Facilities - Site Preparation	Pumps	0	0.00	84	0.74
Dam Facilities - Site Preparation	Rollers	0	0.00	80	0.38
Dam Facilities - Site Preparation	Rough Terrain Forklifts	0	0.00	100	0.40
Dam Facilities - Site Preparation	Rubber Tired Dozers	3	20.00	247	0.40
Dam Facilities - Site Preparation	Rubber Tired Loaders	0	0.00	203	0.36
Dam Facilities - Site Preparation	Scrapers	1	20.00	367	0.48
Dam Facilities - Site Preparation	Signal Boards	0	0.00	6	0.82
Dam Facilities - Site Preparation	Skid Steer Loaders	0	0.00	65	0.37
Dam Facilities - Site Preparation	Surfacing Equipment	0	0.00	263	0.30

Dam Facilities - Site Preparation	Sweepers/Scrubbers	0	0.00	64	0.46
Dam Facilities - Site Preparation	Tractors/Loaders/Backhoes	2	20.00	97	0.37
Dam Facilities - Site Preparation	Trenchers	0	0.00	78	0.50
Dam Facilities - Site Preparation	Welders	0	0.00	46	0.45
Pumping Plant	Aerial Lifts	0	0.00	63	0.31
Pumping Plant	Air Compressors	0	0.00	78	0.48
Pumping Plant	Bore/Drill Rigs	0	0.00	221	0.50
Pumping Plant	Cement and Mortar Mixers	0	0.00	9	0.56
Pumping Plant	Concrete/Industrial Saws	0	0.00	81	0.73
Pumping Plant	Cranes	2	6.00	231	0.29
Pumping Plant	Crawler Tractors	0	0.00	212	0.43
Pumping Plant	Crushing/Proc. Equipment	0	0.00	85	0.78
Pumping Plant	Dumpers/Tenders	8	6.00	16	0.38
Pumping Plant	Excavators	2	6.00	158	0.38
Pumping Plant	Forklifts	0	0.00	89	0.20
Pumping Plant	Generator Sets	0	0.00	84	0.74
Pumping Plant	Graders	2	6.00	187	0.41
Pumping Plant	Off-Highway Tractors	0	0.00	124	0.44
Pumping Plant	Off-Highway Trucks	6	6.00	402	0.38
Pumping Plant	Other Construction Equipment	0	0.00	172	0.42
Pumping Plant	Other General Industrial Equipment	0	0.00	88	0.34
Pumping Plant	Other Material Handling Equipment	0	0.00	168	0.40
Pumping Plant	Pavers	1	6.00	130	0.42
Pumping Plant	Paving Equipment	0	0.00	132	0.36
Pumping Plant	Plate Compactors	0	0.00	8	0.43
Pumping Plant	Pressure Washers	0	0.00	13	0.30
Pumping Plant	Pumps	0	0.00	84	0.74

Pumping Plant	Rollers	4	6.00	80	0.38
Pumping Plant	Rough Terrain Forklifts	0	0.00	100	0.40
Pumping Plant	Rubber Tired Dozers	2	6.00	247	0.40
Pumping Plant	Rubber Tired Loaders	0	0.00	203	0.36
Pumping Plant	Scrapers	0	0.00	367	0.48
Pumping Plant	Signal Boards	0	0.00	6	0.82
Pumping Plant	Skid Steer Loaders	0	0.00	65	0.37
Pumping Plant	Surfacing Equipment	0	0.00	263	0.30
Pumping Plant	Sweepers/Scrubbers	0	0.00	64	0.46
Pumping Plant	Tractors/Loaders/Backhoes	4	5.00	97	0.37
Pumping Plant	Trenchers	0	0.00	78	0.50
Pumping Plant	Welders	0	0.00	46	0.45
Tunneling - Outlet and Conveyance	Aerial Lifts	0	0.00	63	0.31
Tunneling - Outlet and Conveyance	Air Compressors	0	0.00	78	0.48
Tunneling - Outlet and Conveyance	Bore/Drill Rigs	1	10.00	221	0.50
Tunneling - Outlet and Conveyance	Cement and Mortar Mixers	0	0.00	9	0.56
Tunneling - Outlet and Conveyance	Concrete/Industrial Saws	0	0.00	81	0.73
Tunneling - Outlet and Conveyance	Cranes	1	6.00	231	0.29
Tunneling - Outlet and Conveyance	Crawler Tractors	0	0.00	212	0.43
Tunneling - Outlet and Conveyance	Crushing/Proc. Equipment	0	0.00	85	0.78
Tunneling - Outlet and Conveyance	Dumpers/Tenders	7	10.00	16	0.38
Tunneling - Outlet and Conveyance	Excavators	0	0.00	158	0.38
Tunneling - Outlet and Conveyance	Forklifts	0	0.00	89	0.20
Tunneling - Outlet and Conveyance	Generator Sets	0	0.00	84	0.74
Tunneling - Outlet and Conveyance	Graders	0	0.00	187	0.41
Tunneling - Outlet and Conveyance	Off-Highway Tractors	0	0.00	124	0.44
Tunneling - Outlet and Conveyance	Off-Highway Trucks	1	0.00	402	0.38

Tunneling - Outlet and Conveyance	Other Construction Equipment	0	0.00	172	0.42
Tunneling - Outlet and Conveyance	Other General Industrial Equipment	0	0.00	88	0.34
Tunneling - Outlet and Conveyance	Other Material Handling Equipment	0	0.00	168	0.40
Tunneling - Outlet and Conveyance	Pavers	0	0.00	130	0.42
Tunneling - Outlet and Conveyance	Paving Equipment	0	0.00	132	0.36
Tunneling - Outlet and Conveyance	Plate Compactors	0	0.00	8	0.43
Tunneling - Outlet and Conveyance	Pressure Washers	0	0.00	13	0.30
Tunneling - Outlet and Conveyance	Pumps	0	24.00	84	0.74
Tunneling - Outlet and Conveyance	Rollers	0	0.00	80	0.38
Tunneling - Outlet and Conveyance	Rough Terrain Forklifts	0	0.00	100	0.40
Tunneling - Outlet and Conveyance	Rubber Tired Dozers	0	0.00	247	0.40
Tunneling - Outlet and Conveyance	Rubber Tired Loaders	0	0.00	203	0.36
Tunneling - Outlet and Conveyance	Scrapers	0	0.00	367	0.48
Tunneling - Outlet and Conveyance	Signal Boards	0	0.00	6	0.82
Tunneling - Outlet and Conveyance	Skid Steer Loaders	0	0.00	65	0.37
Tunneling - Outlet and Conveyance	Surfacing Equipment	0	0.00	263	0.30
Tunneling - Outlet and Conveyance	Sweepers/Scrubbers	0	0.00	64	0.46
Tunneling - Outlet and Conveyance	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Tunneling - Outlet and Conveyance	Trenchers	0	0.00	78	0.50
Tunneling - Outlet and Conveyance	Welders	0	0.00	46	0.45
Dam Facilities - Saddle Dams	Aerial Lifts	0	0.00	63	0.31
Dam Facilities - Saddle Dams	Air Compressors	0	0.00	78	0.48
Dam Facilities - Saddle Dams	Bore/Drill Rigs	0	0.00	221	0.50
Dam Facilities - Saddle Dams	Cement and Mortar Mixers	0	0.00	9	0.56
Dam Facilities - Saddle Dams	Concrete/Industrial Saws	0	0.00	81	0.73
Dam Facilities - Saddle Dams	Cranes	0	0.00	231	0.29
Dam Facilities - Saddle Dams	Crawler Tractors	0	0.00	212	0.43

Dam Facilities - Saddle Dams	Crushing/Proc. Equipment	0	0.00	85	0.78
Dam Facilities - Saddle Dams	Dumpers/Tenders	10	20.00	16	0.38
Dam Facilities - Saddle Dams	Excavators	1	20.00	158	0.38
Dam Facilities - Saddle Dams	Forklifts	0	0.00	89	0.20
Dam Facilities - Saddle Dams	Generator Sets	0	0.00	84	0.74
Dam Facilities - Saddle Dams	Graders	0	0.00	187	0.41
Dam Facilities - Saddle Dams	Off-Highway Tractors	0	0.00	124	0.44
Dam Facilities - Saddle Dams	Off-Highway Trucks	9	20.00	402	0.38
Dam Facilities - Saddle Dams	Other Construction Equipment	3	20.00	172	0.42
Dam Facilities - Saddle Dams	Other General Industrial Equipment	0	0.00	88	0.34
Dam Facilities - Saddle Dams	Other Material Handling Equipment	0	0.00	168	0.40
Dam Facilities - Saddle Dams	Pavers	0	0.00	130	0.42
Dam Facilities - Saddle Dams	Paving Equipment	0	0.00	132	0.36
Dam Facilities - Saddle Dams	Plate Compactors	0	0.00	8	0.43
Dam Facilities - Saddle Dams	Pressure Washers	0	0.00	13	0.30
Dam Facilities - Saddle Dams	Pumps	0	0.00	84	0.74
Dam Facilities - Saddle Dams	Rollers	0	0.00	80	0.38
Dam Facilities - Saddle Dams	Rough Terrain Forklifts	0	0.00	100	0.40
Dam Facilities - Saddle Dams	Rubber Tired Dozers	0	0.00	247	0.40
Dam Facilities - Saddle Dams	Rubber Tired Loaders	0	0.00	203	0.36
Dam Facilities - Saddle Dams	Scrapers	0	0.00	367	0.48
Dam Facilities - Saddle Dams	Signal Boards	0	0.00	6	0.82
Dam Facilities - Saddle Dams	Skid Steer Loaders	0	0.00	65	0.37
Dam Facilities - Saddle Dams	Surfacing Equipment	0	0.00	263	0.30
Dam Facilities - Saddle Dams	Sweepers/Scrubbers	0	0.00	64	0.46
Dam Facilities - Saddle Dams	Tractors/Loaders/Backhoes	8	20.00	97	0.37
Dam Facilities - Saddle Dams	Trenchers	0	0.00	78	0.50

Dam Facilities - Saddle Dams	Welders	0	0.00	46	0.45
Dam Facilities - Main Dam	Aerial Lifts	0	0.00	63	0.31
Dam Facilities - Main Dam	Air Compressors	0	0.00	78	0.48
Dam Facilities - Main Dam	Bore/Drill Rigs	0	0.00	221	0.50
Dam Facilities - Main Dam	Cement and Mortar Mixers	0	0.00	9	0.56
Dam Facilities - Main Dam	Concrete/Industrial Saws	0	0.00	81	0.73
Dam Facilities - Main Dam	Cranes	0	0.00	231	0.29
Dam Facilities - Main Dam	Crawler Tractors	0	0.00	212	0.43
Dam Facilities - Main Dam	Crushing/Proc. Equipment	0	0.00	85	0.78
Dam Facilities - Main Dam	Dumpers/Tenders	4	20.00	16	0.38
Dam Facilities - Main Dam	Excavators	1	20.00	158	0.38
Dam Facilities - Main Dam	Forklifts	0	0.00	89	0.20
Dam Facilities - Main Dam	Generator Sets	0	0.00	84	0.74
Dam Facilities - Main Dam	Graders	0	0.00	187	0.41
Dam Facilities - Main Dam	Off-Highway Tractors	0	0.00	124	0.44
Dam Facilities - Main Dam	Off-Highway Trucks	9	20.00	402	0.38
Dam Facilities - Main Dam	Other Construction Equipment	3	20.00	172	0.42
Dam Facilities - Main Dam	Other General Industrial Equipment	0	0.00	88	0.34
Dam Facilities - Main Dam	Other Material Handling Equipment	0	0.00	168	0.40
Dam Facilities - Main Dam	Pavers	0	0.00	130	0.42
Dam Facilities - Main Dam	Paving Equipment	0	0.00	132	0.36
Dam Facilities - Main Dam	Plate Compactors	6	20.00	8	0.43
Dam Facilities - Main Dam	Pressure Washers	0	0.00	13	0.30
Dam Facilities - Main Dam	Pumps	0	0.00	84	0.74
Dam Facilities - Main Dam	Rollers	0	0.00	80	0.38
Dam Facilities - Main Dam	Rough Terrain Forklifts	0	0.00	100	0.40
Dam Facilities - Main Dam	Rubber Tired Dozers	6	20.00	247	0.40

Dam Facilities - Main Dam	Rubber Tired Loaders	0	0.00	203	0.36
Dam Facilities - Main Dam	Scrapers	6	20.00	367	0.48
Dam Facilities - Main Dam	Signal Boards	0	0.00	6	0.82
Dam Facilities - Main Dam	Skid Steer Loaders	0	0.00	65	0.37
Dam Facilities - Main Dam	Surfacing Equipment	0	0.00	263	0.30
Dam Facilities - Main Dam	Sweepers/Scrubbers	0	0.00	64	0.46
Dam Facilities - Main Dam	Tractors/Loaders/Backhoes	2	20.00	97	0.37
Dam Facilities - Main Dam	Trenchers	0	0.00	78	0.50
Dam Facilities - Main Dam	Welders	0	0.00	46	0.45
Dam Facilities - Outlet Works	Aerial Lifts	0	0.00	63	0.31
Dam Facilities - Outlet Works	Air Compressors	0	0.00	78	0.48
Dam Facilities - Outlet Works	Bore/Drill Rigs	0	0.00	221	0.50
Dam Facilities - Outlet Works	Cement and Mortar Mixers	0	0.00	9	0.56
Dam Facilities - Outlet Works	Concrete/Industrial Saws	0	0.00	81	0.73
Dam Facilities - Outlet Works	Cranes	0	0.00	231	0.29
Dam Facilities - Outlet Works	Crawler Tractors	0	0.00	212	0.43
Dam Facilities - Outlet Works	Crushing/Proc. Equipment	0	0.00	85	0.78
Dam Facilities - Outlet Works	Dumpers/Tenders	2	20.00	16	0.38
Dam Facilities - Outlet Works	Excavators	0	0.00	158	0.38
Dam Facilities - Outlet Works	Forklifts	0	0.00	89	0.20
Dam Facilities - Outlet Works	Generator Sets	0	0.00	84	0.74
Dam Facilities - Outlet Works	Graders	0	0.00	187	0.41
Dam Facilities - Outlet Works	Off-Highway Tractors	0	0.00	124	0.44
Dam Facilities - Outlet Works	Off-Highway Trucks	0	0.00	402	0.38
Dam Facilities - Outlet Works	Other Construction Equipment	0	0.00	172	0.42
Dam Facilities - Outlet Works	Other General Industrial Equipment	0	0.00	88	0.34
Dam Facilities - Outlet Works	Other Material Handling Equipment	0	0.00	168	0.40

Dam Facilities - Outlet Works	Pavers	0	0.00	130	0.42
Dam Facilities - Outlet Works	Paving Equipment	0	0.00	132	0.36
Dam Facilities - Outlet Works	Plate Compactors	0	0.00	8	0.43
Dam Facilities - Outlet Works	Pressure Washers	0	0.00	13	0.30
Dam Facilities - Outlet Works	Pumps	0	0.00	84	0.74
Dam Facilities - Outlet Works	Rollers	0	0.00	80	0.38
Dam Facilities - Outlet Works	Rough Terrain Forklifts	0	0.00	100	0.40
Dam Facilities - Outlet Works	Rubber Tired Dozers	0	0.00	247	0.40
Dam Facilities - Outlet Works	Rubber Tired Loaders	0	0.00	203	0.36
Dam Facilities - Outlet Works	Scrapers	0	0.00	367	0.48
Dam Facilities - Outlet Works	Signal Boards	0	0.00	6	0.82
Dam Facilities - Outlet Works	Skid Steer Loaders	0	0.00	65	0.37
Dam Facilities - Outlet Works	Surfacing Equipment	0	0.00	263	0.30
Dam Facilities - Outlet Works	Sweepers/Scrubbers	0	0.00	64	0.46
Dam Facilities - Outlet Works	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Dam Facilities - Outlet Works	Trenchers	0	0.00	78	0.50
Dam Facilities - Outlet Works	Welders	0	0.00	46	0.45
Outlet Works PTs	Aerial Lifts	0	0.00	63	0.31
Outlet Works PTs	Air Compressors	0	0.00	78	0.48
Outlet Works PTs	Bore/Drill Rigs	0	0.00	221	0.50
Outlet Works PTs	Cement and Mortar Mixers	0	0.00	9	0.56
Outlet Works PTs	Concrete/Industrial Saws	0	0.00	81	0.73
Outlet Works PTs	Cranes	0	0.00	231	0.29
Outlet Works PTs	Crawler Tractors	0	0.00	212	0.43
Outlet Works PTs	Crushing/Proc. Equipment	0	0.00	85	0.78
Outlet Works PTs	Dumpers/Tenders	0	0.00	16	0.38
Outlet Works PTs	Excavators	0	0.00	158	0.38

Outlet Works PTs	Forklifts	0	0.00	89	0.20
Outlet Works PTs	Generator Sets	0	0.00	84	0.74
Outlet Works PTs	Graders	0	0.00	187	0.41
Outlet Works PTs	Off-Highway Tractors	0	0.00	124	0.44
Outlet Works PTs	Off-Highway Trucks	0	0.00	402	0.38
Outlet Works PTs	Other Construction Equipment	2	5.00	172	0.42
Outlet Works PTs	Other General Industrial Equipment	0	0.00	88	0.34
Outlet Works PTs	Other Material Handling Equipment	0	0.00	168	0.40
Outlet Works PTs	Pavers	0	0.00	130	0.42
Outlet Works PTs	Paving Equipment	0	0.00	132	0.36
Outlet Works PTs	Plate Compactors	0	0.00	8	0.43
Outlet Works PTs	Pressure Washers	0	0.00	13	0.30
Outlet Works PTs	Pumps	0	0.00	84	0.74
Outlet Works PTs	Rollers	0	0.00	80	0.38
Outlet Works PTs	Rough Terrain Forklifts	0	0.00	100	0.40
Outlet Works PTs	Rubber Tired Dozers	0	0.00	247	0.40
Outlet Works PTs	Rubber Tired Loaders	0	0.00	203	0.36
Outlet Works PTs	Scrapers	0	0.00	367	0.48
Outlet Works PTs	Signal Boards	0	0.00	6	0.82
Outlet Works PTs	Skid Steer Loaders	0	0.00	65	0.37
Outlet Works PTs	Surfacing Equipment	0	0.00	263	0.30
Outlet Works PTs	Sweepers/Scrubbers	0	0.00	64	0.46
Outlet Works PTs	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Outlet Works PTs	Trenchers	0	0.00	78	0.50
Outlet Works PTs	Welders	0	0.00	46	0.45
Dam Facilities - Spillway	Aerial Lifts	0	0.00	63	0.31
Dam Facilities - Spillway	Air Compressors	0	0.00	78	0.48

Dam Facilities - Spillway	Bore/Drill Rigs	0	0.00	221	0.50
Dam Facilities - Spillway	Cement and Mortar Mixers	0	0.00	9	0.56
Dam Facilities - Spillway	Concrete/Industrial Saws	0	0.00	81	0.73
Dam Facilities - Spillway	Cranes	0	0.00	231	0.29
Dam Facilities - Spillway	Crawler Tractors	0	0.00	212	0.43
Dam Facilities - Spillway	Crushing/Proc. Equipment	0	0.00	85	0.78
Dam Facilities - Spillway	Dumpers/Tenders	1	20.00	16	0.38
Dam Facilities - Spillway	Excavators	2	20.00	158	0.38
Dam Facilities - Spillway	Forklifts	0	0.00	89	0.20
Dam Facilities - Spillway	Generator Sets	0	0.00	84	0.74
Dam Facilities - Spillway	Graders	0	0.00	187	0.41
Dam Facilities - Spillway	Off-Highway Tractors	0	0.00	124	0.44
Dam Facilities - Spillway	Off-Highway Trucks	0	0.00	402	0.38
Dam Facilities - Spillway	Other Construction Equipment	0	0.00	172	0.42
Dam Facilities - Spillway	Other General Industrial Equipment	0	0.00	88	0.34
Dam Facilities - Spillway	Other Material Handling Equipment	0	0.00	168	0.40
Dam Facilities - Spillway	Pavers	0	0.00	130	0.42
Dam Facilities - Spillway	Paving Equipment	0	0.00	132	0.36
Dam Facilities - Spillway	Plate Compactors	0	0.00	8	0.43
Dam Facilities - Spillway	Pressure Washers	0	0.00	13	0.30
Dam Facilities - Spillway	Pumps	0	0.00	84	0.74
Dam Facilities - Spillway	Rollers	0	0.00	80	0.38
Dam Facilities - Spillway	Rough Terrain Forklifts	0	0.00	100	0.40
Dam Facilities - Spillway	Rubber Tired Dozers	0	0.00	247	0.40
Dam Facilities - Spillway	Rubber Tired Loaders	0	0.00	203	0.36
Dam Facilities - Spillway	Scrapers	0	0.00	367	0.48
Dam Facilities - Spillway	Signal Boards	0	0.00	6	0.82

Dam Facilities - Spillway	Skid Steer Loaders	0	0.00	65	0.37
Dam Facilities - Spillway	Surfacing Equipment	0	0.00	263	0.30
Dam Facilities - Spillway	Sweepers/Scrubbers	0	0.00	64	0.46
Dam Facilities - Spillway	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Dam Facilities - Spillway	Trenchers	0	0.00	78	0.50
Dam Facilities - Spillway	Welders	0	0.00	46	0.45
Conveyance - Open Cut Trench	Aerial Lifts	0	0.00	63	0.31
Conveyance - Open Cut Trench	Air Compressors	0	0.00	78	0.48
Conveyance - Open Cut Trench	Bore/Drill Rigs	0	0.00	221	0.50
Conveyance - Open Cut Trench	Cement and Mortar Mixers	0	0.00	9	0.56
Conveyance - Open Cut Trench	Concrete/Industrial Saws	0	0.00	81	0.73
Conveyance - Open Cut Trench	Cranes	1	6.00	231	0.29
Conveyance - Open Cut Trench	Crawler Tractors	0	0.00	212	0.43
Conveyance - Open Cut Trench	Crushing/Proc. Equipment	0	0.00	85	0.78
Conveyance - Open Cut Trench	Dumpers/Tenders	14	10.00	16	0.38
Conveyance - Open Cut Trench	Excavators	2	10.00	158	0.38
Conveyance - Open Cut Trench	Forklifts	0	0.00	89	0.20
Conveyance - Open Cut Trench	Generator Sets	0	0.00	84	0.74
Conveyance - Open Cut Trench	Graders	0	0.00	187	0.41
Conveyance - Open Cut Trench	Off-Highway Tractors	0	0.00	124	0.44
Conveyance - Open Cut Trench	Off-Highway Trucks	1	10.00	402	0.38
Conveyance - Open Cut Trench	Other Construction Equipment	0	0.00	172	0.42
Conveyance - Open Cut Trench	Other General Industrial Equipment	0	0.00	88	0.34
Conveyance - Open Cut Trench	Other Material Handling Equipment	0	0.00	168	0.40
Conveyance - Open Cut Trench	Pavers	0	0.00	130	0.42
Conveyance - Open Cut Trench	Paving Equipment	0	0.00	132	0.36
Conveyance - Open Cut Trench	Plate Compactors	0	0.00	8	0.43

Conveyance - Open Cut Trench	Pressure Washers	0	0.00	13	0.30
Conveyance - Open Cut Trench	Pumps	1	24.00	84	0.74
Conveyance - Open Cut Trench	Rollers	0	0.00	80	0.38
Conveyance - Open Cut Trench	Rough Terrain Forklifts	0	0.00	100	0.40
Conveyance - Open Cut Trench	Rubber Tired Dozers	1	4.00	247	0.40
Conveyance - Open Cut Trench	Rubber Tired Loaders	0	0.00	203	0.36
Conveyance - Open Cut Trench	Scrapers	0	0.00	367	0.48
Conveyance - Open Cut Trench	Signal Boards	0	0.00	6	0.82
Conveyance - Open Cut Trench	Skid Steer Loaders	0	0.00	65	0.37
Conveyance - Open Cut Trench	Surfacing Equipment	0	0.00	263	0.30
Conveyance - Open Cut Trench	Sweepers/Scrubbers	0	0.00	64	0.46
Conveyance - Open Cut Trench	Tractors/Loaders/Backhoes	2	10.00	97	0.37
Conveyance - Open Cut Trench	Trenchers	0	0.00	78	0.50
Conveyance - Open Cut Trench	Welders	0	0.00	46	0.45
Open Cut Trench PTs	Aerial Lifts	0	0.00	63	0.31
Open Cut Trench PTs	Air Compressors	0	0.00	78	0.48
Open Cut Trench PTs	Bore/Drill Rigs	0	0.00	221	0.50
Open Cut Trench PTs	Cement and Mortar Mixers	0	0.00	9	0.56
Open Cut Trench PTs	Concrete/Industrial Saws	0	0.00	81	0.73
Open Cut Trench PTs	Cranes	0	0.00	231	0.29
Open Cut Trench PTs	Crawler Tractors	0	0.00	212	0.43
Open Cut Trench PTs	Crushing/Proc. Equipment	0	0.00	85	0.78
Open Cut Trench PTs	Dumpers/Tenders	0	0.00	16	0.38
Open Cut Trench PTs	Excavators	0	0.00	158	0.38
Open Cut Trench PTs	Forklifts	0	0.00	89	0.20
Open Cut Trench PTs	Generator Sets	0	0.00	84	0.74
Open Cut Trench PTs	Graders	0	0.00	187	0.41

Open Cut Trench PTs	Off-Highway Tractors	0	0.00	124	0.44
Open Cut Trench PTs	Off-Highway Trucks	0	0.00	402	0.38
Open Cut Trench PTs	Other Construction Equipment	3	5.00	172	0.42
Open Cut Trench PTs	Other General Industrial Equipment	0	0.00	88	0.34
Open Cut Trench PTs	Other Material Handling Equipment	0	0.00	168	0.40
Open Cut Trench PTs	Pavers	0	0.00	130	0.42
Open Cut Trench PTs	Paving Equipment	0	0.00	132	0.36
Open Cut Trench PTs	Plate Compactors	0	0.00	8	0.43
Open Cut Trench PTs	Pressure Washers	0	0.00	13	0.30
Open Cut Trench PTs	Pumps	0	0.00	84	0.74
Open Cut Trench PTs	Rollers	0	0.00	80	0.38
Open Cut Trench PTs	Rough Terrain Forklifts	0	0.00	100	0.40
Open Cut Trench PTs	Rubber Tired Dozers	0	0.00	247	0.40
Open Cut Trench PTs	Rubber Tired Loaders	0	0.00	203	0.36
Open Cut Trench PTs	Scrapers	0	0.00	367	0.48
Open Cut Trench PTs	Signal Boards	0	0.00	6	0.82
Open Cut Trench PTs	Skid Steer Loaders	0	0.00	65	0.37
Open Cut Trench PTs	Surfacing Equipment	0	0.00	263	0.30
Open Cut Trench PTs	Sweepers/Scrubbers	0	0.00	64	0.46
Open Cut Trench PTs	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Open Cut Trench PTs	Trenchers	0	0.00	78	0.50
Open Cut Trench PTs	Welders	0	0.00	46	0.45
Dam Facilities - Site Restoration	Aerial Lifts	0	0.00	63	0.31
Dam Facilities - Site Restoration	Air Compressors	0	0.00	78	0.48
Dam Facilities - Site Restoration	Bore/Drill Rigs	0	0.00	221	0.50
Dam Facilities - Site Restoration	Cement and Mortar Mixers	0	0.00	9	0.56
Dam Facilities - Site Restoration	Concrete/Industrial Saws	0	0.00	81	0.73

Dam Facilities - Site Restoration	Cranes	0	0.00	231	0.29
Dam Facilities - Site Restoration	Crawler Tractors	0	0.00	212	0.43
Dam Facilities - Site Restoration	Crushing/Proc. Equipment	0	0.00	85	0.78
Dam Facilities - Site Restoration	Dumpers/Tenders	4	20.00	16	0.38
Dam Facilities - Site Restoration	Excavators	0	0.00	158	0.38
Dam Facilities - Site Restoration	Forklifts	0	0.00	89	0.20
Dam Facilities - Site Restoration	Generator Sets	0	0.00	84	0.74
Dam Facilities - Site Restoration	Graders	2	20.00	187	0.41
Dam Facilities - Site Restoration	Off-Highway Tractors	0	0.00	124	0.44
Dam Facilities - Site Restoration	Off-Highway Trucks	0	0.00	402	0.38
Dam Facilities - Site Restoration	Other Construction Equipment	0	0.00	172	0.42
Dam Facilities - Site Restoration	Other General Industrial Equipment	0	0.00	88	0.34
Dam Facilities - Site Restoration	Other Material Handling Equipment	0	0.00	168	0.40
Dam Facilities - Site Restoration	Pavers	0	0.00	130	0.42
Dam Facilities - Site Restoration	Paving Equipment	0	0.00	132	0.36
Dam Facilities - Site Restoration	Plate Compactors	1	20.00	8	0.43
Dam Facilities - Site Restoration	Pressure Washers	0	0.00	13	0.30
Dam Facilities - Site Restoration	Pumps	0	0.00	84	0.74
Dam Facilities - Site Restoration	Rollers	0	0.00	80	0.38
Dam Facilities - Site Restoration	Rough Terrain Forklifts	0	0.00	100	0.40
Dam Facilities - Site Restoration	Rubber Tired Dozers	0	0.00	247	0.40
Dam Facilities - Site Restoration	Rubber Tired Loaders	0	0.00	203	0.36
Dam Facilities - Site Restoration	Scrapers	0	0.00	367	0.48
Dam Facilities - Site Restoration	Signal Boards	0	0.00	6	0.82
Dam Facilities - Site Restoration	Skid Steer Loaders	0	0.00	65	0.37
Dam Facilities - Site Restoration	Surfacing Equipment	0	0.00	263	0.30
Dam Facilities - Site Restoration	Sweepers/Scrubbers	0	0.00	64	0.46

Dam Facilities - Site Restoration	Tractors/Loaders/Backhoes	1	20.00	97	0.37
Dam Facilities - Site Restoration	Trenchers	0	0.00	78	0.50
Dam Facilities - Site Restoration	Welders	0	0.00	46	0.45

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
Utilities - Petroleum Pipeline	29	37.00	3.00	0.00	30.00	75.00	75.00	LD_Mix	HDT_Mix	HHDT
Utilities - Transmission Lines (to be scaled)	30	25.00	6.00	0.00	30.00	75.00	75.00	LD_Mix	HDT_Mix	HHDT
Transmission Lines PTs	10	13.00	0.00	0.00	30.00	75.00	75.00	LD_Mix	HDT_Mix	HHDT
Roadway - Excavation	42	53.00	0.00	7.00	30.00	75.00	75.00	LD_Mix	HDT_Mix	HHDT
Roadway - Grading and Paving	8	10.00	10.00	7.00	30.00	75.00	75.00	LD_Mix	HDT_Mix	HHDT
Dam Facilities - Site Preparation	13	17.00	5.00	4.00	30.00	75.00	75.00	LD_Mix	HDT_Mix	HHDT
Pumping Plant	31	39.00	1.00	6.00	30.00	75.00	75.00	LD_Mix	HDT_Mix	HHDT
Tunneling - Outlet and Conveyance	11	7.00	0.00	0.00	30.00	75.00	75.00	LD_Mix	HDT_Mix	HHDT
Dam Facilities - Saddle Dams	31	39.00	17.00	48.00	30.00	75.00	75.00	LD_Mix	HDT_Mix	HHDT
Dam Facilities - Main Dam	37	47.00	9.00	108.00	30.00	75.00	75.00	LD_Mix	HDT_Mix	HHDT
Dam Facilities - Outlet Works	2	3.00	5.00	3.00	30.00	75.00	75.00	LD_Mix	HDT_Mix	HHDT
Outlet Works PTs	2	3.00	0.00	0.00	30.00	75.00	75.00	LD_Mix	HDT_Mix	HHDT
Dam Facilities - Spillway	3	4.00	3.00	0.00	30.00	75.00	75.00	LD_Mix	HDT_Mix	HHDT
Conveyance - Open Cut Trench	22	8.00	8.00	41.00	30.00	75.00	75.00	LD_Mix	HDT_Mix	HHDT
Open Cut Trench PTs	3	4.00	0.00	0.00	30.00	75.00	75.00	LD_Mix	HDT_Mix	HHDT
Dam Facilities - Site Restoration	8	10.00	2.00	0.00	30.00	75.00	75.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Utilities - Petroleum Pipeline - 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					0.9108	0.0000	0.9108	0.5007	0.0000	0.5007	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.6782	6.0394	6.5323	0.0105		0.3035	0.3035		0.2816	0.2816	0.0000	903.5646	903.5646	0.2738	0.0000	910.4093
Total	**0.6782**	**6.0394**	**6.5323**	**0.0105**	**0.9108**	**0.3035**	**1.2143**	**0.5007**	**0.2816**	**0.7823**	**0.0000**	**903.5646**	**903.5646**	**0.2738**	**0.0000**	**910.4093**

3.2 Utilities - Petroleum Pipeline - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.3800e-003	0.0854	0.0177	4.1000e-004	0.0123	4.4000e-004	0.0128	3.5500e-003	4.2000e-004	3.9800e-003	0.0000	38.7028	38.7028	5.6000e-004	0.0000	38.7169
Worker	0.0183	0.0130	0.1322	4.5000e-004	0.0497	3.1000e-004	0.0500	0.0132	2.8000e-004	0.0135	0.0000	40.7797	40.7797	9.4000e-004	0.0000	40.8031
Total	**0.0217**	**0.0984**	**0.1499**	**8.6000e-004**	**0.0620**	**7.5000e-004**	**0.0627**	**0.0168**	**7.0000e-004**	**0.0175**	**0.0000**	**79.4826**	**79.4826**	**1.5000e-003**	**0.0000**	**79.5200**

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					0.4099	0.0000	0.4099	0.2253	0.0000	0.2253	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1636	1.2887	7.2719	0.0105		0.0342	0.0342		0.0327	0.0327	0.0000	903.5635	903.5635	0.2738	0.0000	910.4082
Total	**0.1636**	**1.2887**	**7.2719**	**0.0105**	**0.4099**	**0.0342**	**0.4441**	**0.2253**	**0.0327**	**0.2580**	**0.0000**	**903.5635**	**903.5635**	**0.2738**	**0.0000**	**910.4082**

3.2 Utilities - Petroleum Pipeline - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.3800e-003	0.0854	0.0177	4.1000e-004	0.0123	4.4000e-004	0.0128	3.5500e-003	4.2000e-004	3.9800e-003	0.0000	38.7028	38.7028	5.6000e-004	0.0000	38.7169
Worker	0.0183	0.0130	0.1322	4.5000e-004	0.0497	3.1000e-004	0.0500	0.0132	2.8000e-004	0.0135	0.0000	40.7797	40.7797	9.4000e-004	0.0000	40.8031
Total	**0.0217**	**0.0984**	**0.1499**	**8.6000e-004**	**0.0620**	**7.5000e-004**	**0.0627**	**0.0168**	**7.0000e-004**	**0.0175**	**0.0000**	**79.4826**	**79.4826**	**1.5000e-003**	**0.0000**	**79.5200**

3.3 Utilities - Transmission Lines (to be scaled) - 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					1.1063	0.0000	1.1063	0.1860	0.0000	0.1860	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0901	0.9873	0.5686	1.4300e-003		0.0418	0.0418		0.0385	0.0385	0.0000	125.0752	125.0752	0.0402	0.0000	126.0790
Total	**0.0901**	**0.9873**	**0.5686**	**1.4300e-003**	**1.1063**	**0.0418**	**1.1481**	**0.1860**	**0.0385**	**0.2245**	**0.0000**	**125.0752**	**125.0752**	**0.0402**	**0.0000**	**126.0790**

3.3 Utilities - Transmission Lines (to be scaled) - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1200e-003	0.0282	5.8600e-003	1.3000e-004	4.0700e-003	1.5000e-004	4.2200e-003	1.1700e-003	1.4000e-004	1.3100e-003	0.0000	12.7943	12.7943	1.9000e-004	0.0000	12.7990
Worker	2.0500e-003	1.4500e-003	0.0148	5.0000e-005	5.5500e-003	3.0000e-005	5.5800e-003	1.4700e-003	3.0000e-005	1.5100e-003	0.0000	4.5544	4.5544	1.0000e-004	0.0000	4.5570
Total	**3.1700e-003**	**0.0297**	**0.0206**	**1.8000e-004**	**9.6200e-003**	**1.8000e-004**	**9.8000e-003**	**2.6400e-003**	**1.7000e-004**	**2.8200e-003**	**0.0000**	**17.3487**	**17.3487**	**2.9000e-004**	**0.0000**	**17.3560**

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					0.4979	0.0000	0.4979	0.0837	0.0000	0.0837	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0240	0.1585	0.7413	1.4300e-003		5.9300e-003	5.9300e-003		5.6300e-003	5.6300e-003	0.0000	125.0750	125.0750	0.0402	0.0000	126.0789
Total	**0.0240**	**0.1585**	**0.7413**	**1.4300e-003**	**0.4979**	**5.9300e-003**	**0.5038**	**0.0837**	**5.6300e-003**	**0.0893**	**0.0000**	**125.0750**	**125.0750**	**0.0402**	**0.0000**	**126.0789**

3.3 Utilities - Transmission Lines (to be scaled) - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1200e-003	0.0282	5.8600e-003	1.3000e-004	4.0700e-003	1.5000e-004	4.2200e-003	1.1700e-003	1.4000e-004	1.3100e-003	0.0000	12.7943	12.7943	1.9000e-004	0.0000	12.7990
Worker	2.0500e-003	1.4500e-003	0.0148	5.0000e-005	5.5500e-003	3.0000e-005	5.5800e-003	1.4700e-003	3.0000e-005	1.5100e-003	0.0000	4.5544	4.5544	1.0000e-004	0.0000	4.5570
Total	**3.1700e-003**	**0.0297**	**0.0206**	**1.8000e-004**	**9.6200e-003**	**1.8000e-004**	**9.8000e-003**	**2.6400e-003**	**1.7000e-004**	**2.8200e-003**	**0.0000**	**17.3487**	**17.3487**	**2.9000e-004**	**0.0000**	**17.3560**

3.3 Utilities - Transmission Lines (to be scaled) - 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					2.9130	0.0000	2.9130	1.1790	0.0000	1.1790	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0631	11.2953	7.1643	0.0186		0.4741	0.4741		0.4366	0.4366	0.0000	1,626.0939	1,626.0939	0.5220	0.0000	1,639.1446
Total	**1.0631**	**11.2953**	**7.1643**	**0.0186**	**2.9130**	**0.4741**	**3.3870**	**1.1790**	**0.4366**	**1.6156**	**0.0000**	**1,626.0939**	**1,626.0939**	**0.5220**	**0.0000**	**1,639.1446**

3.3 Utilities - Transmission Lines (to be scaled) - 2023

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	9.9000e-003	0.2360	0.0637	1.7100e-003	0.0529	5.9000e-004	0.0535	0.0153	5.7000e-004	0.0158	0.0000	162.5004	162.5004	1.7400e-003	0.0000	162.5438
Worker	0.0248	0.0169	0.1752	6.3000e-004	0.0721	4.3000e-004	0.0726	0.0192	4.0000e-004	0.0196	0.0000	56.9956	56.9956	1.2100e-003	0.0000	57.0259
Total	**0.0347**	**0.2529**	**0.2390**	**2.3400e-003**	**0.1251**	**1.0200e-003**	**0.1261**	**0.0344**	**9.7000e-004**	**0.0354**	**0.0000**	**219.4960**	**219.4960**	**2.9500e-003**	**0.0000**	**219.5697**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.3108	0.0000	1.3108	0.5306	0.0000	0.5306	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3024	1.9215	9.6159	0.0186		0.0708	0.0708		0.0674	0.0674	0.0000	1,626.0919	1,626.0919	0.5220	0.0000	1,639.1426
Total	**0.3024**	**1.9215**	**9.6159**	**0.0186**	**1.3108**	**0.0708**	**1.3816**	**0.5306**	**0.0674**	**0.5979**	**0.0000**	**1,626.0919**	**1,626.0919**	**0.5220**	**0.0000**	**1,639.1426**

3.3 Utilities - Transmission Lines (to be scaled) - 2023

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	9.9000e-003	0.2360	0.0637	1.7100e-003	0.0529	5.9000e-004	0.0535	0.0153	5.7000e-004	0.0158	0.0000	162.5004	162.5004	1.7400e-003	0.0000	162.5438
Worker	0.0248	0.0169	0.1752	6.3000e-004	0.0721	4.3000e-004	0.0726	0.0192	4.0000e-004	0.0196	0.0000	56.9956	56.9956	1.2100e-003	0.0000	57.0259
Total	**0.0347**	**0.2529**	**0.2390**	**2.3400e-003**	**0.1251**	**1.0200e-003**	**0.1261**	**0.0344**	**9.7000e-004**	**0.0354**	**0.0000**	**219.4960**	**219.4960**	**2.9500e-003**	**0.0000**	**219.5697**

3.3 Utilities - Transmission Lines (to be scaled) - 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					2.9280	0.0000	2.9280	1.1873	0.0000	1.1873	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0282	10.6308	7.1745	0.0187		0.4467	0.4467		0.4114	0.4114	0.0000	1,638.8359	1,638.8359	0.5261	0.0000	1,651.9889
Total	**1.0282**	**10.6308**	**7.1745**	**0.0187**	**2.9280**	**0.4467**	**3.3747**	**1.1873**	**0.4114**	**1.5987**	**0.0000**	**1,638.8359**	**1,638.8359**	**0.5261**	**0.0000**	**1,651.9889**

3.3 Utilities - Transmission Lines (to be scaled) - 2024

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	9.8000e-003	0.2338	0.0619	1.7200e-003	0.0533	6.0000e-004	0.0539	0.0154	5.7000e-004	0.0160	0.0000	162.9594	162.9594	1.7300e-003	0.0000	163.0027
Worker	0.0234	0.0153	0.1634	6.1000e-004	0.0727	4.3000e-004	0.0731	0.0193	3.9000e-004	0.0197	0.0000	55.2483	55.2483	1.1000e-003	0.0000	55.2758
Total	**0.0332**	**0.2492**	**0.2252**	**2.3300e-003**	**0.1260**	**1.0300e-003**	**0.1270**	**0.0347**	**9.6000e-004**	**0.0357**	**0.0000**	**218.2077**	**218.2077**	**2.8300e-003**	**0.0000**	**218.2785**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.3176	0.0000	1.3176	0.5343	0.0000	0.5343	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3007	1.8666	9.6851	0.0187		0.0684	0.0684		0.0652	0.0652	0.0000	1,638.8340	1,638.8340	0.5261	0.0000	1,651.9870
Total	**0.3007**	**1.8666**	**9.6851**	**0.0187**	**1.3176**	**0.0684**	**1.3860**	**0.5343**	**0.0652**	**0.5995**	**0.0000**	**1,638.8340**	**1,638.8340**	**0.5261**	**0.0000**	**1,651.9870**

3.3 Utilities - Transmission Lines (to be scaled) - 2024

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	9.8000e-003	0.2338	0.0619	1.7200e-003	0.0533	6.0000e-004	0.0539	0.0154	5.7000e-004	0.0160	0.0000	162.9594	162.9594	1.7300e-003	0.0000	163.0027
Worker	0.0234	0.0153	0.1634	6.1000e-004	0.0727	4.3000e-004	0.0731	0.0193	3.9000e-004	0.0197	0.0000	55.2483	55.2483	1.1000e-003	0.0000	55.2758
Total	**0.0332**	**0.2492**	**0.2252**	**2.3300e-003**	**0.1260**	**1.0300e-003**	**0.1270**	**0.0347**	**9.6000e-004**	**0.0357**	**0.0000**	**218.2077**	**218.2077**	**2.8300e-003**	**0.0000**	**218.2785**

3.3 Utilities - Transmission Lines (to be scaled) - 2025

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					2.3032	0.0000	2.3032	0.8439	0.0000	0.8439	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.6454	6.4308	4.8171	0.0128		0.2697	0.2697		0.2484	0.2484	0.0000	1,119.7320	1,119.7320	0.3595	0.0000	1,128.7188
Total	**0.6454**	**6.4308**	**4.8171**	**0.0128**	**2.3032**	**0.2697**	**2.5729**	**0.8439**	**0.2484**	**1.0923**	**0.0000**	**1,119.7320**	**1,119.7320**	**0.3595**	**0.0000**	**1,128.7188**

3.3 Utilities - Transmission Lines (to be scaled) - 2025

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	6.5800e-003	0.1570	0.0409	1.1700e-003	0.0364	4.0000e-004	0.0369	0.0105	3.9000e-004	0.0109	0.0000	110.8192	110.8192	1.1800e-003	0.0000	110.8486
Worker	0.0151	9.4900e-003	0.1029	4.0000e-004	0.0497	2.8000e-004	0.0499	0.0132	2.6000e-004	0.0135	0.0000	36.2530	36.2530	6.8000e-004	0.0000	36.2699
Total	**0.0216**	**0.1664**	**0.1439**	**1.5700e-003**	**0.0861**	**6.8000e-004**	**0.0868**	**0.0237**	**6.5000e-004**	**0.0244**	**0.0000**	**147.0722**	**147.0722**	**1.8600e-003**	**0.0000**	**147.1185**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0365	0.0000	1.0365	0.3797	0.0000	0.3797	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2000	1.1963	6.6089	0.0128		0.0434	0.0434		0.0415	0.0415	0.0000	1,119.7307	1,119.7307	0.3595	0.0000	1,128.7175
Total	**0.2000**	**1.1963**	**6.6089**	**0.0128**	**1.0365**	**0.0434**	**1.0799**	**0.3797**	**0.0415**	**0.4212**	**0.0000**	**1,119.7307**	**1,119.7307**	**0.3595**	**0.0000**	**1,128.7175**

3.3 Utilities - Transmission Lines (to be scaled) - 2025

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	6.5800e-003	0.1570	0.0409	1.1700e-003	0.0364	4.0000e-004	0.0369	0.0105	3.9000e-004	0.0109	0.0000	110.8192	110.8192	1.1800e-003	0.0000	110.8486
Worker	0.0151	9.4900e-003	0.1029	4.0000e-004	0.0497	2.8000e-004	0.0499	0.0132	2.6000e-004	0.0135	0.0000	36.2530	36.2530	6.8000e-004	0.0000	36.2699
Total	**0.0216**	**0.1664**	**0.1439**	**1.5700e-003**	**0.0861**	**6.8000e-004**	**0.0868**	**0.0237**	**6.5000e-004**	**0.0244**	**0.0000**	**147.0722**	**147.0722**	**1.8600e-003**	**0.0000**	**147.1185**

3.4 Transmission Lines PTs - 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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0188	0.1908	0.2010	3.1000e-004		9.9500e-003	9.9500e-003		9.1600e-003	9.1600e-003	0.0000	27.1399	27.1399	8.7800e-003	0.0000	27.3593
Total	**0.0188**	**0.1908**	**0.2010**	**3.1000e-004**	**0.0000**	**9.9500e-003**	**9.9500e-003**	**0.0000**	**9.1600e-003**	**9.1600e-003**	**0.0000**	**27.1399**	**27.1399**	**8.7800e-003**	**0.0000**	**27.3593**

3.4 Transmission Lines PTs - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0600e-003	7.6000e-004	7.6800e-003	3.0000e-005	2.8800e-003	2.0000e-005	2.9000e-003	7.7000e-004	2.0000e-005	7.8000e-004	0.0000	2.3683	2.3683	5.0000e-005	0.0000	2.3696
Total	**1.0600e-003**	**7.6000e-004**	**7.6800e-003**	**3.0000e-005**	**2.8800e-003**	**2.0000e-005**	**2.9000e-003**	**7.7000e-004**	**2.0000e-005**	**7.8000e-004**	**0.0000**	**2.3683**	**2.3683**	**5.0000e-005**	**0.0000**	**2.3696**

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.1700e-003	0.0322	0.2326	3.1000e-004		1.3600e-003	1.3600e-003		1.2900e-003	1.2900e-003	0.0000	27.1398	27.1398	8.7800e-003	0.0000	27.3593
Total	**5.1700e-003**	**0.0322**	**0.2326**	**3.1000e-004**	**0.0000**	**1.3600e-003**	**1.3600e-003**	**0.0000**	**1.2900e-003**	**1.2900e-003**	**0.0000**	**27.1398**	**27.1398**	**8.7800e-003**	**0.0000**	**27.3593**

3.4 Transmission Lines PTs - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0600e-003	7.6000e-004	7.6800e-003	3.0000e-005	2.8800e-003	2.0000e-005	2.9000e-003	7.7000e-004	2.0000e-005	7.8000e-004	0.0000	2.3683	2.3683	5.0000e-005	0.0000	2.3696
Total	**1.0600e-003**	**7.6000e-004**	**7.6800e-003**	**3.0000e-005**	**2.8800e-003**	**2.0000e-005**	**2.9000e-003**	**7.7000e-004**	**2.0000e-005**	**7.8000e-004**	**0.0000**	**2.3683**	**2.3683**	**5.0000e-005**	**0.0000**	**2.3696**

3.4 Transmission Lines PTs - 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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2265	2.2346	2.6017	4.0200e-003		0.1163	0.1163		0.1070	0.1070	0.0000	352.7770	352.7770	0.1141	0.0000	355.6294
Total	**0.2265**	**2.2346**	**2.6017**	**4.0200e-003**	**0.0000**	**0.1163**	**0.1163**	**0.0000**	**0.1070**	**0.1070**	**0.0000**	**352.7770**	**352.7770**	**0.1141**	**0.0000**	**355.6294**

3.4 Transmission Lines PTs - 2023

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	0.0129	8.8000e-003	0.0911	3.3000e-004	0.0375	2.2000e-004	0.0377	9.9600e-003	2.1000e-004	0.0102	0.0000	29.6377	29.6377	6.3000e-004	0.0000	29.6535
Total	**0.0129**	**8.8000e-003**	**0.0911**	**3.3000e-004**	**0.0375**	**2.2000e-004**	**0.0377**	**9.9600e-003**	**2.1000e-004**	**0.0102**	**0.0000**	**29.6377**	**29.6377**	**6.3000e-004**	**0.0000**	**29.6535**

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0656	0.3971	3.0226	4.0200e-003		0.0165	0.0165		0.0157	0.0157	0.0000	352.7766	352.7766	0.1141	0.0000	355.6290
Total	**0.0656**	**0.3971**	**3.0226**	**4.0200e-003**	**0.0000**	**0.0165**	**0.0165**	**0.0000**	**0.0157**	**0.0157**	**0.0000**	**352.7766**	**352.7766**	**0.1141**	**0.0000**	**355.6290**

3.4 Transmission Lines PTs - 2023

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	0.0129	8.8000e-003	0.0911	3.3000e-004	0.0375	2.2000e-004	0.0377	9.9600e-003	2.1000e-004	0.0102	0.0000	29.6377	29.6377	6.3000e-004	0.0000	29.6535
Total	**0.0129**	**8.8000e-003**	**0.0911**	**3.3000e-004**	**0.0375**	**2.2000e-004**	**0.0377**	**9.9600e-003**	**2.1000e-004**	**0.0102**	**0.0000**	**29.6377**	**29.6377**	**6.3000e-004**	**0.0000**	**29.6535**

3.4 Transmission Lines PTs - 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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2174	2.1032	2.6284	4.0500e-003		0.1085	0.1085		0.0998	0.0998	0.0000	355.4805	355.4805	0.1150	0.0000	358.3548
Total	**0.2174**	**2.1032**	**2.6284**	**4.0500e-003**	**0.0000**	**0.1085**	**0.1085**	**0.0000**	**0.0998**	**0.0998**	**0.0000**	**355.4805**	**355.4805**	**0.1150**	**0.0000**	**358.3548**

3.4 Transmission Lines PTs - 2024

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	0.0122	7.9800e-003	0.0849	3.2000e-004	0.0378	2.2000e-004	0.0380	0.0100	2.0000e-004	0.0102	0.0000	28.7291	28.7291	5.7000e-004	0.0000	28.7434
Total	**0.0122**	**7.9800e-003**	**0.0849**	**3.2000e-004**	**0.0378**	**2.2000e-004**	**0.0380**	**0.0100**	**2.0000e-004**	**0.0102**	**0.0000**	**28.7291**	**28.7291**	**5.7000e-004**	**0.0000**	**28.7434**

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0651	0.3867	3.0464	4.0500e-003		0.0158	0.0158		0.0151	0.0151	0.0000	355.4801	355.4801	0.1150	0.0000	358.3543
Total	**0.0651**	**0.3867**	**3.0464**	**4.0500e-003**	**0.0000**	**0.0158**	**0.0158**	**0.0000**	**0.0151**	**0.0151**	**0.0000**	**355.4801**	**355.4801**	**0.1150**	**0.0000**	**358.3543**

3.4 Transmission Lines PTs - 2024

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	0.0122	7.9800e-003	0.0849	3.2000e-004	0.0378	2.2000e-004	0.0380	0.0100	2.0000e-004	0.0102	0.0000	28.7291	28.7291	5.7000e-004	0.0000	28.7434
Total	**0.0122**	**7.9800e-003**	**0.0849**	**3.2000e-004**	**0.0378**	**2.2000e-004**	**0.0380**	**0.0100**	**2.0000e-004**	**0.0102**	**0.0000**	**28.7291**	**28.7291**	**5.7000e-004**	**0.0000**	**28.7434**

3.4 Transmission Lines PTs - 2025

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1331	1.2289	1.7783	2.7500e-003		0.0636	0.0636		0.0585	0.0585	0.0000	241.6632	241.6632	0.0782	0.0000	243.6172
Total	**0.1331**	**1.2289**	**1.7783**	**2.7500e-003**	**0.0000**	**0.0636**	**0.0636**	**0.0000**	**0.0585**	**0.0585**	**0.0000**	**241.6632**	**241.6632**	**0.0782**	**0.0000**	**243.6172**

3.4 Transmission Lines PTs - 2025

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	7.7900e-003	4.9100e-003	0.0532	2.1000e-004	0.0257	1.5000e-004	0.0258	6.8200e-003	1.4000e-004	6.9600e-003	0.0000	18.7462	18.7462	3.5000e-004	0.0000	18.7550
Total	**7.7900e-003**	**4.9100e-003**	**0.0532**	**2.1000e-004**	**0.0257**	**1.5000e-004**	**0.0258**	**6.8200e-003**	**1.4000e-004**	**6.9600e-003**	**0.0000**	**18.7462**	**18.7462**	**3.5000e-004**	**0.0000**	**18.7550**

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0429	0.2447	2.0690	2.7500e-003		9.8500e-003	9.8500e-003		9.3900e-003	9.3900e-003	0.0000	241.6629	241.6629	0.0782	0.0000	243.6169
Total	**0.0429**	**0.2447**	**2.0690**	**2.7500e-003**	**0.0000**	**9.8500e-003**	**9.8500e-003**	**0.0000**	**9.3900e-003**	**9.3900e-003**	**0.0000**	**241.6629**	**241.6629**	**0.0782**	**0.0000**	**243.6169**

3.4 Transmission Lines PTs - 2025

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	7.7900e-003	4.9100e-003	0.0532	2.1000e-004	0.0257	1.5000e-004	0.0258	6.8200e-003	1.4000e-004	6.9600e-003	0.0000	18.7462	18.7462	3.5000e-004	0.0000	18.7550
Total	**7.7900e-003**	**4.9100e-003**	**0.0532**	**2.1000e-004**	**0.0257**	**1.5000e-004**	**0.0258**	**6.8200e-003**	**1.4000e-004**	**6.9600e-003**	**0.0000**	**18.7462**	**18.7462**	**3.5000e-004**	**0.0000**	**18.7550**

3.5 Roadway - Excavation - 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					5.0504	0.0000	5.0504	2.5404	0.0000	2.5404	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.4256	13.0693	10.3565	0.0273		0.5505	0.5505		0.5075	0.5075	0.0000	2,392.3079	2,392.3079	0.7648	0.0000	2,411.4269
Total	**1.4256**	**13.0693**	**10.3565**	**0.0273**	**5.0504**	**0.5505**	**5.6008**	**2.5404**	**0.5075**	**3.0478**	**0.0000**	**2,392.3079**	**2,392.3079**	**0.7648**	**0.0000**	**2,411.4269**

3.5 Roadway - Excavation - 2023

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	4.0000e-005	9.8000e-004	2.6000e-004	1.0000e-005	2.1000e-004	0.0000	2.1000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.6211	0.6211	1.0000e-005	0.0000	0.6214
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	0.0207	0.2143	7.7000e-004	0.0882	5.3000e-004	0.0887	0.0234	4.9000e-004	0.0239	0.0000	69.7100	69.7100	1.4800e-003	0.0000	69.7471
Total	**0.0304**	**0.0217**	**0.2146**	**7.8000e-004**	**0.0884**	**5.3000e-004**	**0.0889**	**0.0235**	**4.9000e-004**	**0.0240**	**0.0000**	**70.3311**	**70.3311**	**1.4900e-003**	**0.0000**	**70.3684**

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					2.2727	0.0000	2.2727	1.1432	0.0000	1.1432	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4264	2.4682	13.2143	0.0273		0.0889	0.0889		0.0851	0.0851	0.0000	2,392.3051	2,392.3051	0.7648	0.0000	2,411.4241
Total	**0.4264**	**2.4682**	**13.2143**	**0.0273**	**2.2727**	**0.0889**	**2.3615**	**1.1432**	**0.0851**	**1.2282**	**0.0000**	**2,392.3051**	**2,392.3051**	**0.7648**	**0.0000**	**2,411.4241**

3.5 Roadway - Excavation - 2023

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	4.0000e-005	9.8000e-004	2.6000e-004	1.0000e-005	2.1000e-004	0.0000	2.1000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.6211	0.6211	1.0000e-005	0.0000	0.6214
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	0.0207	0.2143	7.7000e-004	0.0882	5.3000e-004	0.0887	0.0234	4.9000e-004	0.0239	0.0000	69.7100	69.7100	1.4800e-003	0.0000	69.7471
Total	**0.0304**	**0.0217**	**0.2146**	**7.8000e-004**	**0.0884**	**5.3000e-004**	**0.0889**	**0.0235**	**4.9000e-004**	**0.0240**	**0.0000**	**70.3311**	**70.3311**	**1.4900e-003**	**0.0000**	**70.3684**

3.5 Roadway - Excavation - 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					2.0694	0.0000	2.0694	0.9018	0.0000	0.9018	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4794	4.2620	3.4984	9.2900e-003		0.1796	0.1796		0.1656	0.1656	0.0000	813.4212	813.4212	0.2600	0.0000	819.9220
Total	**0.4794**	**4.2620**	**3.4984**	**9.2900e-003**	**2.0694**	**0.1796**	**2.2490**	**0.9018**	**0.1656**	**1.0674**	**0.0000**	**813.4212**	**813.4212**	**0.2600**	**0.0000**	**819.9220**

3.5 Roadway - Excavation - 2024

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	1.0000e-005	3.2000e-004	9.0000e-005	0.0000	1.8000e-004	0.0000	1.8000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.2099	0.2099	0.0000	0.0000	0.2100
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	9.6700e-003	6.3300e-003	0.0674	2.5000e-004	0.0300	1.8000e-004	0.0302	7.9700e-003	1.6000e-004	8.1300e-003	0.0000	22.7994	22.7994	4.5000e-004	0.0000	22.8108
Total	**9.6800e-003**	**6.6500e-003**	**0.0675**	**2.5000e-004**	**0.0302**	**1.8000e-004**	**0.0304**	**8.0200e-003**	**1.6000e-004**	**8.1800e-003**	**0.0000**	**23.0093**	**23.0093**	**4.5000e-004**	**0.0000**	**23.0208**

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					0.9312	0.0000	0.9312	0.4058	0.0000	0.4058	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1445	0.8233	4.4905	9.2900e-003		0.0296	0.0296		0.0283	0.0283	0.0000	813.4203	813.4203	0.2600	0.0000	819.9210
Total	**0.1445**	**0.8233**	**4.4905**	**9.2900e-003**	**0.9312**	**0.0296**	**0.9608**	**0.4058**	**0.0283**	**0.4341**	**0.0000**	**813.4203**	**813.4203**	**0.2600**	**0.0000**	**819.9210**

3.5 Roadway - Excavation - 2024

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	1.0000e-005	3.2000e-004	9.0000e-005	0.0000	1.8000e-004	0.0000	1.8000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.2099	0.2099	0.0000	0.0000	0.2100
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	9.6700e-003	6.3300e-003	0.0674	2.5000e-004	0.0300	1.8000e-004	0.0302	7.9700e-003	1.6000e-004	8.1300e-003	0.0000	22.7994	22.7994	4.5000e-004	0.0000	22.8108
Total	**9.6800e-003**	**6.6500e-003**	**0.0675**	**2.5000e-004**	**0.0302**	**1.8000e-004**	**0.0304**	**8.0200e-003**	**1.6000e-004**	**8.1800e-003**	**0.0000**	**23.0093**	**23.0093**	**4.5000e-004**	**0.0000**	**23.0208**

3.6 Roadway - Grading and Paving - 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					0.4642	0.0000	0.4642	0.0502	0.0000	0.0502	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4790	5.2085	4.0759	9.0600e-003		0.2171	0.2171		0.1998	0.1998	0.0000	796.1139	796.1139	0.2575	0.0000	802.5509
Total	**0.4790**	**5.2085**	**4.0759**	**9.0600e-003**	**0.4642**	**0.2171**	**0.6813**	**0.0502**	**0.1998**	**0.2500**	**0.0000**	**796.1139**	**796.1139**	**0.2575**	**0.0000**	**802.5509**

3.6 Roadway - Grading and Paving - 2024

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	3.0000e-005	7.7000e-004	2.1000e-004	1.0000e-005	2.0000e-004	0.0000	2.0000e-004	5.0000e-005	0.0000	6.0000e-005	0.0000	0.5014	0.5014	1.0000e-005	0.0000	0.5016
Vendor	0.0132	0.3153	0.0834	2.3100e-003	0.0719	8.0000e-004	0.0727	0.0208	7.7000e-004	0.0215	0.0000	219.7671	219.7671	2.3400e-003	0.0000	219.8255
Worker	7.5800e-003	4.9700e-003	0.0529	2.0000e-004	0.0235	1.4000e-004	0.0237	6.2500e-003	1.3000e-004	6.3800e-003	0.0000	17.8819	17.8819	3.6000e-004	0.0000	17.8908
Total	**0.0208**	**0.3211**	**0.1365**	**2.5200e-003**	**0.0957**	**9.4000e-004**	**0.0966**	**0.0271**	**9.0000e-004**	**0.0280**	**0.0000**	**238.1504**	**238.1504**	**2.7100e-003**	**0.0000**	**238.2180**

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					0.2089	0.0000	0.2089	0.0226	0.0000	0.0226	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1326	0.7682	5.2208	9.0600e-003		0.0250	0.0250		0.0241	0.0241	0.0000	796.1129	796.1129	0.2575	0.0000	802.5499
Total	**0.1326**	**0.7682**	**5.2208**	**9.0600e-003**	**0.2089**	**0.0250**	**0.2339**	**0.0226**	**0.0241**	**0.0467**	**0.0000**	**796.1129**	**796.1129**	**0.2575**	**0.0000**	**802.5499**

3.6 Roadway - Grading and Paving - 2024

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	3.0000e-005	7.7000e-004	2.1000e-004	1.0000e-005	2.0000e-004	0.0000	2.0000e-004	5.0000e-005	0.0000	6.0000e-005	0.0000	0.5014	0.5014	1.0000e-005	0.0000	0.5016
Vendor	0.0132	0.3153	0.0834	2.3100e-003	0.0719	8.0000e-004	0.0727	0.0208	7.7000e-004	0.0215	0.0000	219.7671	219.7671	2.3400e-003	0.0000	219.8255
Worker	7.5800e-003	4.9700e-003	0.0529	2.0000e-004	0.0235	1.4000e-004	0.0237	6.2500e-003	1.3000e-004	6.3800e-003	0.0000	17.8819	17.8819	3.6000e-004	0.0000	17.8908
Total	**0.0208**	**0.3211**	**0.1365**	**2.5200e-003**	**0.0957**	**9.4000e-004**	**0.0966**	**0.0271**	**9.0000e-004**	**0.0280**	**0.0000**	**238.1504**	**238.1504**	**2.7100e-003**	**0.0000**	**238.2180**

3.6 Roadway - Grading and Paving - 2025

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					0.4642	0.0000	0.4642	0.0502	0.0000	0.0502	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2837	2.9860	2.6043	5.8600e-003		0.1236	0.1236		0.1137	0.1137	0.0000	514.3112	514.3112	0.1663	0.0000	518.4697
Total	**0.2837**	**2.9860**	**2.6043**	**5.8600e-003**	**0.4642**	**0.1236**	**0.5878**	**0.0502**	**0.1137**	**0.1639**	**0.0000**	**514.3112**	**514.3112**	**0.1663**	**0.0000**	**518.4697**

3.6 Roadway - Grading and Paving - 2025

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	2.0000e-005	4.8000e-004	1.3000e-004	0.0000	1.9000e-004	0.0000	1.9000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.3222	0.3222	1.0000e-005	0.0000	0.3223
Vendor	8.4000e-003	0.2002	0.0522	1.4900e-003	0.0465	5.1000e-004	0.0470	0.0134	4.9000e-004	0.0139	0.0000	141.3615	141.3615	1.5000e-003	0.0000	141.3990
Worker	4.6100e-003	2.9000e-003	0.0315	1.2000e-004	0.0152	9.0000e-005	0.0153	4.0400e-003	8.0000e-005	4.1200e-003	0.0000	11.0987	11.0987	2.1000e-004	0.0000	11.1039
Total	**0.0130**	**0.2036**	**0.0839**	**1.6100e-003**	**0.0619**	**6.0000e-004**	**0.0625**	**0.0175**	**5.7000e-004**	**0.0181**	**0.0000**	**152.7824**	**152.7824**	**1.7200e-003**	**0.0000**	**152.8252**

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					0.2089	0.0000	0.2089	0.0226	0.0000	0.0226	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0839	0.4667	3.3710	5.8600e-003		0.0152	0.0152		0.0147	0.0147	0.0000	514.3106	514.3106	0.1663	0.0000	518.4691
Total	**0.0839**	**0.4667**	**3.3710**	**5.8600e-003**	**0.2089**	**0.0152**	**0.2241**	**0.0226**	**0.0147**	**0.0373**	**0.0000**	**514.3106**	**514.3106**	**0.1663**	**0.0000**	**518.4691**

3.6 Roadway - Grading and Paving - 2025

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	2.0000e-005	4.8000e-004	1.3000e-004	0.0000	1.9000e-004	0.0000	1.9000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.3222	0.3222	1.0000e-005	0.0000	0.3223
Vendor	8.4000e-003	0.2002	0.0522	1.4900e-003	0.0465	5.1000e-004	0.0470	0.0134	4.9000e-004	0.0139	0.0000	141.3615	141.3615	1.5000e-003	0.0000	141.3990
Worker	4.6100e-003	2.9000e-003	0.0315	1.2000e-004	0.0152	9.0000e-005	0.0153	4.0400e-003	8.0000e-005	4.1200e-003	0.0000	11.0987	11.0987	2.1000e-004	0.0000	11.1039
Total	**0.0130**	**0.2036**	**0.0839**	**1.6100e-003**	**0.0619**	**6.0000e-004**	**0.0625**	**0.0175**	**5.7000e-004**	**0.0181**	**0.0000**	**152.7824**	**152.7824**	**1.7200e-003**	**0.0000**	**152.8252**

3.7 Dam Facilities - Site Preparation - 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					2.9734	0.0000	2.9734	1.5280	0.0000	1.5280	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.8204	7.5687	5.4016	0.0152		0.3157	0.3157		0.2908	0.2908	0.0000	1,334.9048	1,334.9048	0.4289	0.0000	1,345.6270
Total	**0.8204**	**7.5687**	**5.4016**	**0.0152**	**2.9734**	**0.3157**	**3.2892**	**1.5280**	**0.2908**	**1.8189**	**0.0000**	**1,334.9048**	**1,334.9048**	**0.4289**	**0.0000**	**1,345.6270**

3.7 Dam Facilities - Site Preparation - 2024

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	3.0000e-005	7.3000e-004	2.0000e-004	0.0000	1.3000e-004	0.0000	1.3000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.4743	0.4743	1.0000e-005	0.0000	0.4745
Vendor	3.7700e-003	0.0900	0.0238	6.6000e-004	0.0205	2.3000e-004	0.0208	5.9200e-003	2.2000e-004	6.1400e-003	0.0000	62.7165	62.7165	6.7000e-004	0.0000	62.7332
Worker	7.3600e-003	4.8200e-003	0.0513	1.9000e-004	0.0228	1.3000e-004	0.0230	6.0600e-003	1.2000e-004	6.1900e-003	0.0000	17.3505	17.3505	3.5000e-004	0.0000	17.3591
Total	**0.0112**	**0.0955**	**0.0753**	**8.5000e-004**	**0.0435**	**3.6000e-004**	**0.0439**	**0.0120**	**3.4000e-004**	**0.0124**	**0.0000**	**80.5413**	**80.5413**	**1.0300e-003**	**0.0000**	**80.5668**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.3380	0.0000	1.3380	0.6876	0.0000	0.6876	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2427	1.4214	7.1580	0.0152		0.0512	0.0512		0.0490	0.0490	0.0000	1,334.9032	1,334.9032	0.4289	0.0000	1,345.6254
Total	**0.2427**	**1.4214**	**7.1580**	**0.0152**	**1.3380**	**0.0512**	**1.3893**	**0.6876**	**0.0490**	**0.7366**	**0.0000**	**1,334.9032**	**1,334.9032**	**0.4289**	**0.0000**	**1,345.6254**

3.7 Dam Facilities - Site Preparation - 2024

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	3.0000e-005	7.3000e-004	2.0000e-004	0.0000	1.3000e-004	0.0000	1.3000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.4743	0.4743	1.0000e-005	0.0000	0.4745
Vendor	3.7700e-003	0.0900	0.0238	6.6000e-004	0.0205	2.3000e-004	0.0208	5.9200e-003	2.2000e-004	6.1400e-003	0.0000	62.7165	62.7165	6.7000e-004	0.0000	62.7332
Worker	7.3600e-003	4.8200e-003	0.0513	1.9000e-004	0.0228	1.3000e-004	0.0230	6.0600e-003	1.2000e-004	6.1900e-003	0.0000	17.3505	17.3505	3.5000e-004	0.0000	17.3591
Total	**0.0112**	**0.0955**	**0.0753**	**8.5000e-004**	**0.0435**	**3.6000e-004**	**0.0439**	**0.0120**	**3.4000e-004**	**0.0124**	**0.0000**	**80.5413**	**80.5413**	**1.0300e-003**	**0.0000**	**80.5668**

3.8 Pumping Plant - 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					0.7755	0.0000	0.7755	0.3671	0.0000	0.3671	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4228	3.6599	3.1369	8.6900e-003		0.1504	0.1504		0.1390	0.1390	0.0000	758.4476	758.4476	0.2402	0.0000	764.4528
Total	**0.4228**	**3.6599**	**3.1369**	**8.6900e-003**	**0.7755**	**0.1504**	**0.9258**	**0.3671**	**0.1390**	**0.5060**	**0.0000**	**758.4476**	**758.4476**	**0.2402**	**0.0000**	**764.4528**

3.8 Pumping Plant - 2024

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	3.0000e-005	7.7000e-004	2.1000e-004	1.0000e-005	1.8000e-004	0.0000	1.8000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.5009	0.5009	1.0000e-005	0.0000	0.5011
Vendor	8.8000e-004	0.0211	5.5900e-003	1.5000e-004	4.8200e-003	5.0000e-005	4.8700e-003	1.3900e-003	5.0000e-005	1.4400e-003	0.0000	14.7203	14.7203	1.6000e-004	0.0000	14.7242
Worker	0.0198	0.0130	0.1381	5.2000e-004	0.0614	3.6000e-004	0.0618	0.0163	3.3000e-004	0.0167	0.0000	46.7123	46.7123	9.3000e-004	0.0000	46.7355
Total	**0.0207**	**0.0349**	**0.1439**	**6.8000e-004**	**0.0664**	**4.1000e-004**	**0.0669**	**0.0178**	**3.8000e-004**	**0.0182**	**0.0000**	**61.9334**	**61.9334**	**1.1000e-003**	**0.0000**	**61.9608**

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					0.3490	0.0000	0.3490	0.1652	0.0000	0.1652	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1288	0.7031	4.2394	8.6900e-003		0.0242	0.0242		0.0233	0.0233	0.0000	758.4467	758.4467	0.2402	0.0000	764.4519
Total	**0.1288**	**0.7031**	**4.2394**	**8.6900e-003**	**0.3490**	**0.0242**	**0.3731**	**0.1652**	**0.0233**	**0.1885**	**0.0000**	**758.4467**	**758.4467**	**0.2402**	**0.0000**	**764.4519**

3.8 Pumping Plant - 2024

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	3.0000e-005	7.7000e-004	2.1000e-004	1.0000e-005	1.8000e-004	0.0000	1.8000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.5009	0.5009	1.0000e-005	0.0000	0.5011
Vendor	8.8000e-004	0.0211	5.5900e-003	1.5000e-004	4.8200e-003	5.0000e-005	4.8700e-003	1.3900e-003	5.0000e-005	1.4400e-003	0.0000	14.7203	14.7203	1.6000e-004	0.0000	14.7242
Worker	0.0198	0.0130	0.1381	5.2000e-004	0.0614	3.6000e-004	0.0618	0.0163	3.3000e-004	0.0167	0.0000	46.7123	46.7123	9.3000e-004	0.0000	46.7355
Total	**0.0207**	**0.0349**	**0.1439**	**6.8000e-004**	**0.0664**	**4.1000e-004**	**0.0669**	**0.0178**	**3.8000e-004**	**0.0182**	**0.0000**	**61.9334**	**61.9334**	**1.1000e-003**	**0.0000**	**61.9608**

3.8 Pumping Plant - 2025

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					0.4006	0.0000	0.4006	0.1610	0.0000	0.1610	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1658	1.3645	1.2835	3.6100e-003		0.0551	0.0551		0.0509	0.0509	0.0000	315.0496	315.0496	0.0998	0.0000	317.5441
Total	**0.1658**	**1.3645**	**1.2835**	**3.6100e-003**	**0.4006**	**0.0551**	**0.4557**	**0.1610**	**0.0509**	**0.2119**	**0.0000**	**315.0496**	**315.0496**	**0.0998**	**0.0000**	**317.5441**

3.8 Pumping Plant - 2025

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	1.0000e-005	3.1000e-004	8.0000e-005	0.0000	1.6000e-004	0.0000	1.6000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.2070	0.2070	0.0000	0.0000	0.2070
Vendor	3.6000e-004	8.6200e-003	2.2500e-003	6.0000e-005	2.0000e-003	2.0000e-005	2.0200e-003	5.8000e-004	2.0000e-005	6.0000e-004	0.0000	6.0878	6.0878	6.0000e-005	0.0000	6.0895
Worker	7.7500e-003	4.8800e-003	0.0529	2.1000e-004	0.0255	1.5000e-004	0.0257	6.7800e-003	1.3000e-004	6.9200e-003	0.0000	18.6409	18.6409	3.5000e-004	0.0000	18.6496
Total	**8.1200e-003**	**0.0138**	**0.0553**	**2.7000e-004**	**0.0277**	**1.7000e-004**	**0.0279**	**7.4000e-003**	**1.5000e-004**	**7.5600e-003**	**0.0000**	**24.9357**	**24.9357**	**4.1000e-004**	**0.0000**	**24.9461**

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					0.1803	0.0000	0.1803	0.0725	0.0000	0.0725	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0527	0.2789	1.7597	3.6100e-003		9.4700e-003	9.4700e-003		9.1500e-003	9.1500e-003	0.0000	315.0493	315.0493	0.0998	0.0000	317.5437
Total	**0.0527**	**0.2789**	**1.7597**	**3.6100e-003**	**0.1803**	**9.4700e-003**	**0.1897**	**0.0725**	**9.1500e-003**	**0.0816**	**0.0000**	**315.0493**	**315.0493**	**0.0998**	**0.0000**	**317.5437**

3.8 Pumping Plant - 2025

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	1.0000e-005	3.1000e-004	8.0000e-005	0.0000	1.6000e-004	0.0000	1.6000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.2070	0.2070	0.0000	0.0000	0.2070
Vendor	3.6000e-004	8.6200e-003	2.2500e-003	6.0000e-005	2.0000e-003	2.0000e-005	2.0200e-003	5.8000e-004	2.0000e-005	6.0000e-004	0.0000	6.0878	6.0878	6.0000e-005	0.0000	6.0895
Worker	7.7500e-003	4.8800e-003	0.0529	2.1000e-004	0.0255	1.5000e-004	0.0257	6.7800e-003	1.3000e-004	6.9200e-003	0.0000	18.6409	18.6409	3.5000e-004	0.0000	18.6496
Total	**8.1200e-003**	**0.0138**	**0.0553**	**2.7000e-004**	**0.0277**	**1.7000e-004**	**0.0279**	**7.4000e-003**	**1.5000e-004**	**7.5600e-003**	**0.0000**	**24.9357**	**24.9357**	**4.1000e-004**	**0.0000**	**24.9461**

3.9 Tunneling - Outlet and Conveyance - 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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0792	0.6416	0.5069	1.5800e-003		0.0247	0.0247		0.0235	0.0235	0.0000	132.8564	132.8564	0.0366	0.0000	133.7712
Total	**0.0792**	**0.6416**	**0.5069**	**1.5800e-003**	**0.0000**	**0.0247**	**0.0247**	**0.0000**	**0.0235**	**0.0235**	**0.0000**	**132.8564**	**132.8564**	**0.0366**	**0.0000**	**133.7712**

3.9 Tunneling - Outlet and Conveyance - 2024

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	3.0500e-003	2.0000e-003	0.0213	8.0000e-005	9.4800e-003	6.0000e-005	9.5300e-003	2.5200e-003	5.0000e-005	2.5700e-003	0.0000	7.2034	7.2034	1.4000e-004	0.0000	7.2070
Total	**3.0500e-003**	**2.0000e-003**	**0.0213**	**8.0000e-005**	**9.4800e-003**	**6.0000e-005**	**9.5300e-003**	**2.5200e-003**	**5.0000e-005**	**2.5700e-003**	**0.0000**	**7.2034**	**7.2034**	**1.4000e-004**	**0.0000**	**7.2070**

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0201	0.1084	0.5978	1.5800e-003		3.7800e-003	3.7800e-003		3.7000e-003	3.7000e-003	0.0000	132.8562	132.8562	0.0366	0.0000	133.7710
Total	**0.0201**	**0.1084**	**0.5978**	**1.5800e-003**	**0.0000**	**3.7800e-003**	**3.7800e-003**	**0.0000**	**3.7000e-003**	**3.7000e-003**	**0.0000**	**132.8562**	**132.8562**	**0.0366**	**0.0000**	**133.7710**

3.9 Tunneling - Outlet and Conveyance - 2024

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	3.0500e-003	2.0000e-003	0.0213	8.0000e-005	9.4800e-003	6.0000e-005	9.5300e-003	2.5200e-003	5.0000e-005	2.5700e-003	0.0000	7.2034	7.2034	1.4000e-004	0.0000	7.2070
Total	**3.0500e-003**	**2.0000e-003**	**0.0213**	**8.0000e-005**	**9.4800e-003**	**6.0000e-005**	**9.5300e-003**	**2.5200e-003**	**5.0000e-005**	**2.5700e-003**	**0.0000**	**7.2034**	**7.2034**	**1.4000e-004**	**0.0000**	**7.2070**

3.9 Tunneling - Outlet and Conveyance - 2025

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1659	1.3190	1.0795	3.3800e-003		0.0499	0.0499		0.0475	0.0475	0.0000	284.2446	284.2446	0.0783	0.0000	286.2019
Total	**0.1659**	**1.3190**	**1.0795**	**3.3800e-003**	**0.0000**	**0.0499**	**0.0499**	**0.0000**	**0.0475**	**0.0475**	**0.0000**	**284.2446**	**284.2446**	**0.0783**	**0.0000**	**286.2019**

3.9 Tunneling - Outlet and Conveyance - 2025

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	6.1500e-003	3.8700e-003	0.0420	1.6000e-004	0.0203	1.2000e-004	0.0204	5.3900e-003	1.1000e-004	5.4900e-003	0.0000	14.8009	14.8009	2.8000e-004	0.0000	14.8079
Total	**6.1500e-003**	**3.8700e-003**	**0.0420**	**1.6000e-004**	**0.0203**	**1.2000e-004**	**0.0204**	**5.3900e-003**	**1.1000e-004**	**5.4900e-003**	**0.0000**	**14.8009**	**14.8009**	**2.8000e-004**	**0.0000**	**14.8079**

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0427	0.2275	1.2785	3.3800e-003		7.8400e-003	7.8400e-003		7.6900e-003	7.6900e-003	0.0000	284.2443	284.2443	0.0783	0.0000	286.2015
Total	**0.0427**	**0.2275**	**1.2785**	**3.3800e-003**	**0.0000**	**7.8400e-003**	**7.8400e-003**	**0.0000**	**7.6900e-003**	**7.6900e-003**	**0.0000**	**284.2443**	**284.2443**	**0.0783**	**0.0000**	**286.2015**

3.9 Tunneling - Outlet and Conveyance - 2025

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	6.1500e-003	3.8700e-003	0.0420	1.6000e-004	0.0203	1.2000e-004	0.0204	5.3900e-003	1.1000e-004	5.4900e-003	0.0000	14.8009	14.8009	2.8000e-004	0.0000	14.8079
Total	**6.1500e-003**	**3.8700e-003**	**0.0420**	**1.6000e-004**	**0.0203**	**1.2000e-004**	**0.0204**	**5.3900e-003**	**1.1000e-004**	**5.4900e-003**	**0.0000**	**14.8009**	**14.8009**	**2.8000e-004**	**0.0000**	**14.8079**

3.9 Tunneling - Outlet and Conveyance - 2026

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1659	1.3190	1.0795	3.3800e-003		0.0499	0.0499		0.0475	0.0475	0.0000	284.2446	284.2446	0.0783	0.0000	286.2019
Total	**0.1659**	**1.3190**	**1.0795**	**3.3800e-003**	**0.0000**	**0.0499**	**0.0499**	**0.0000**	**0.0475**	**0.0475**	**0.0000**	**284.2446**	**284.2446**	**0.0783**	**0.0000**	**286.2019**

3.9 Tunneling - Outlet and Conveyance - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.8300e-003	3.5300e-003	0.0393	1.6000e-004	0.0203	1.1000e-004	0.0204	5.3900e-003	1.0000e-004	5.4900e-003	0.0000	14.2834	14.2834	2.5000e-004	0.0000	14.2897
Total	**5.8300e-003**	**3.5300e-003**	**0.0393**	**1.6000e-004**	**0.0203**	**1.1000e-004**	**0.0204**	**5.3900e-003**	**1.0000e-004**	**5.4900e-003**	**0.0000**	**14.2834**	**14.2834**	**2.5000e-004**	**0.0000**	**14.2897**

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0427	0.2275	1.2785	3.3800e-003		7.8400e-003	7.8400e-003		7.6900e-003	7.6900e-003	0.0000	284.2443	284.2443	0.0783	0.0000	286.2015
Total	**0.0427**	**0.2275**	**1.2785**	**3.3800e-003**	**0.0000**	**7.8400e-003**	**7.8400e-003**	**0.0000**	**7.6900e-003**	**7.6900e-003**	**0.0000**	**284.2443**	**284.2443**	**0.0783**	**0.0000**	**286.2015**

3.9 Tunneling - Outlet and Conveyance - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.8300e-003	3.5300e-003	0.0393	1.6000e-004	0.0203	1.1000e-004	0.0204	5.3900e-003	1.0000e-004	5.4900e-003	0.0000	14.2834	14.2834	2.5000e-004	0.0000	14.2897
Total	**5.8300e-003**	**3.5300e-003**	**0.0393**	**1.6000e-004**	**0.0203**	**1.1000e-004**	**0.0204**	**5.3900e-003**	**1.0000e-004**	**5.4900e-003**	**0.0000**	**14.2834**	**14.2834**	**2.5000e-004**	**0.0000**	**14.2897**

3.9 Tunneling - Outlet and Conveyance - 2027

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0807	0.6418	0.5253	1.6400e-003		0.0243	0.0243		0.0231	0.0231	0.0000	138.3106	138.3106	0.0381	0.0000	139.2630
Total	**0.0807**	**0.6418**	**0.5253**	**1.6400e-003**	**0.0000**	**0.0243**	**0.0243**	**0.0000**	**0.0231**	**0.0231**	**0.0000**	**138.3106**	**138.3106**	**0.0381**	**0.0000**	**139.2630**

3.9 Tunneling - Outlet and Conveyance - 2027

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	2.6800e-003	1.5700e-003	0.0178	7.0000e-005	9.8600e-003	5.0000e-005	9.9200e-003	2.6200e-003	5.0000e-005	2.6700e-003	0.0000	6.7160	6.7160	1.1000e-004	0.0000	6.7188
Total	**2.6800e-003**	**1.5700e-003**	**0.0178**	**7.0000e-005**	**9.8600e-003**	**5.0000e-005**	**9.9200e-003**	**2.6200e-003**	**5.0000e-005**	**2.6700e-003**	**0.0000**	**6.7160**	**6.7160**	**1.1000e-004**	**0.0000**	**6.7188**

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0208	0.1107	0.6221	1.6400e-003		3.8100e-003	3.8100e-003		3.7400e-003	3.7400e-003	0.0000	138.3104	138.3104	0.0381	0.0000	139.2628
Total	**0.0208**	**0.1107**	**0.6221**	**1.6400e-003**	**0.0000**	**3.8100e-003**	**3.8100e-003**	**0.0000**	**3.7400e-003**	**3.7400e-003**	**0.0000**	**138.3104**	**138.3104**	**0.0381**	**0.0000**	**139.2628**

3.9 Tunneling - Outlet and Conveyance - 2027

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	2.6800e-003	1.5700e-003	0.0178	7.0000e-005	9.8600e-003	5.0000e-005	9.9200e-003	2.6200e-003	5.0000e-005	2.6700e-003	0.0000	6.7160	6.7160	1.1000e-004	0.0000	6.7188
Total	**2.6800e-003**	**1.5700e-003**	**0.0178**	**7.0000e-005**	**9.8600e-003**	**5.0000e-005**	**9.9200e-003**	**2.6200e-003**	**5.0000e-005**	**2.6700e-003**	**0.0000**	**6.7160**	**6.7160**	**1.1000e-004**	**0.0000**	**6.7188**

3.10 Dam Facilities - Saddle Dams - 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					0.0220	0.0000	0.0220	3.3200e-003	0.0000	3.3200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.9607	7.2953	8.2811	0.0223		0.2995	0.2995		0.2773	0.2773	0.0000	1,948.0118	1,948.0118	0.6148	0.0000	1,963.3817
Total	**0.9607**	**7.2953**	**8.2811**	**0.0223**	**0.0220**	**0.2995**	**0.3214**	**3.3200e-003**	**0.2773**	**0.2806**	**0.0000**	**1,948.0118**	**1,948.0118**	**0.6148**	**0.0000**	**1,963.3817**

3.10 Dam Facilities - Saddle Dams - 2024

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	6.0000e-005	1.4000e-003	3.8000e-004	1.0000e-005	1.2200e-003	0.0000	1.2200e-003	3.1000e-004	0.0000	3.1000e-004	0.0000	0.9138	0.9138	1.0000e-005	0.0000	0.9142
Vendor	0.0108	0.2579	0.0683	1.8900e-003	0.0588	6.6000e-004	0.0595	0.0170	6.3000e-004	0.0176	0.0000	179.7529	179.7529	1.9100e-003	0.0000	179.8007
Worker	0.0142	9.3200e-003	0.0992	3.7000e-004	0.0441	2.6000e-004	0.0444	0.0117	2.4000e-004	0.0120	0.0000	33.5539	33.5539	6.7000e-004	0.0000	33.5706
Total	**0.0251**	**0.2686**	**0.1678**	**2.2700e-003**	**0.1042**	**9.2000e-004**	**0.1051**	**0.0290**	**8.7000e-004**	**0.0299**	**0.0000**	**214.2206**	**214.2206**	**2.5900e-003**	**0.0000**	**214.2854**

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					9.8800e-003	0.0000	9.8800e-003	1.5000e-003	0.0000	1.5000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3239	1.6766	11.2109	0.0223		0.0581	0.0581		0.0561	0.0561	0.0000	1,948.0095	1,948.0095	0.6148	0.0000	1,963.3794
Total	**0.3239**	**1.6766**	**11.2109**	**0.0223**	**9.8800e-003**	**0.0581**	**0.0679**	**1.5000e-003**	**0.0561**	**0.0576**	**0.0000**	**1,948.0095**	**1,948.0095**	**0.6148**	**0.0000**	**1,963.3794**

3.10 Dam Facilities - Saddle Dams - 2024

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	6.0000e-005	1.4000e-003	3.8000e-004	1.0000e-005	1.2200e-003	0.0000	1.2200e-003	3.1000e-004	0.0000	3.1000e-004	0.0000	0.9138	0.9138	1.0000e-005	0.0000	0.9142
Vendor	0.0108	0.2579	0.0683	1.8900e-003	0.0588	6.6000e-004	0.0595	0.0170	6.3000e-004	0.0176	0.0000	179.7529	179.7529	1.9100e-003	0.0000	179.8007
Worker	0.0142	9.3200e-003	0.0992	3.7000e-004	0.0441	2.6000e-004	0.0444	0.0117	2.4000e-004	0.0120	0.0000	33.5539	33.5539	6.7000e-004	0.0000	33.5706
Total	**0.0251**	**0.2686**	**0.1678**	**2.2700e-003**	**0.1042**	**9.2000e-004**	**0.1051**	**0.0290**	**8.7000e-004**	**0.0299**	**0.0000**	**214.2206**	**214.2206**	**2.5900e-003**	**0.0000**	**214.2854**

3.10 Dam Facilities - Saddle Dams - 2025

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					0.0220	0.0000	0.0220	3.3200e-003	0.0000	3.3200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.3340	16.5170	20.9657	0.0572		0.6576	0.6576		0.6095	0.6095	0.0000	4,983.8642	4,983.8642	1.5729	0.0000	5,023.1869
Total	**2.3340**	**16.5170**	**20.9657**	**0.0572**	**0.0220**	**0.6576**	**0.6796**	**3.3200e-003**	**0.6095**	**0.6128**	**0.0000**	**4,983.8642**	**4,983.8642**	**1.5729**	**0.0000**	**5,023.1869**

3.10 Dam Facilities - Saddle Dams - 2025

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	1.4000e-004	3.5000e-003	9.5000e-004	2.0000e-005	1.3100e-003	1.0000e-005	1.3200e-003	3.4000e-004	1.0000e-005	3.5000e-004	0.0000	2.3251	2.3251	4.0000e-005	0.0000	2.3260
Vendor	0.0272	0.6484	0.1691	4.8200e-003	0.1506	1.6700e-003	0.1522	0.0434	1.5900e-003	0.0450	0.0000	457.8256	457.8256	4.8500e-003	0.0000	457.9470
Worker	0.0343	0.0216	0.2341	9.1000e-004	0.1129	6.5000e-004	0.1136	0.0300	6.0000e-004	0.0306	0.0000	82.4624	82.4624	1.5400e-003	0.0000	82.5010
Total	**0.0616**	**0.6735**	**0.4042**	**5.7500e-003**	**0.2648**	**2.3300e-003**	**0.2671**	**0.0738**	**2.2000e-003**	**0.0760**	**0.0000**	**542.6131**	**542.6131**	**6.4300e-003**	**0.0000**	**542.7739**

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					9.8800e-003	0.0000	9.8800e-003	1.5000e-003	0.0000	1.5000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.8181	4.1013	28.6667	0.0572		0.1392	0.1392		0.1350	0.1350	0.0000	4,983.8583	4,983.8583	1.5729	0.0000	5,023.1810
Total	**0.8181**	**4.1013**	**28.6667**	**0.0572**	**9.8800e-003**	**0.1392**	**0.1491**	**1.5000e-003**	**0.1350**	**0.1365**	**0.0000**	**4,983.8583**	**4,983.8583**	**1.5729**	**0.0000**	**5,023.1810**

3.10 Dam Facilities - Saddle Dams - 2025

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	1.4000e-004	3.5000e-003	9.5000e-004	2.0000e-005	1.3100e-003	1.0000e-005	1.3200e-003	3.4000e-004	1.0000e-005	3.5000e-004	0.0000	2.3251	2.3251	4.0000e-005	0.0000	2.3260
Vendor	0.0272	0.6484	0.1691	4.8200e-003	0.1506	1.6700e-003	0.1522	0.0434	1.5900e-003	0.0450	0.0000	457.8256	457.8256	4.8500e-003	0.0000	457.9470
Worker	0.0343	0.0216	0.2341	9.1000e-004	0.1129	6.5000e-004	0.1136	0.0300	6.0000e-004	0.0306	0.0000	82.4624	82.4624	1.5400e-003	0.0000	82.5010
Total	**0.0616**	**0.6735**	**0.4042**	**5.7500e-003**	**0.2648**	**2.3300e-003**	**0.2671**	**0.0738**	**2.2000e-003**	**0.0760**	**0.0000**	**542.6131**	**542.6131**	**6.4300e-003**	**0.0000**	**542.7739**

3.10 Dam Facilities - Saddle Dams - 2026

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					0.0220	0.0000	0.0220	3.3200e-003	0.0000	3.3200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.3340	16.5170	20.9657	0.0572		0.6576	0.6576		0.6095	0.6095	0.0000	4,983.8642	4,983.8642	1.5729	0.0000	5,023.1869
Total	**2.3340**	**16.5170**	**20.9657**	**0.0572**	**0.0220**	**0.6576**	**0.6796**	**3.3200e-003**	**0.6095**	**0.6128**	**0.0000**	**4,983.8642**	**4,983.8642**	**1.5729**	**0.0000**	**5,023.1869**

3.10 Dam Facilities - Saddle Dams - 2026

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	1.4000e-004	3.4100e-003	9.4000e-004	2.0000e-005	1.3100e-003	1.0000e-005	1.3200e-003	3.4000e-004	1.0000e-005	3.5000e-004	0.0000	2.3133	2.3133	4.0000e-005	0.0000	2.3142
Vendor	0.0268	0.6366	0.1649	4.8000e-003	0.1506	1.6500e-003	0.1522	0.0434	1.5800e-003	0.0450	0.0000	455.8777	455.8777	4.8300e-003	0.0000	455.9985
Worker	0.0325	0.0197	0.2188	8.8000e-004	0.1129	6.3000e-004	0.1136	0.0300	5.8000e-004	0.0306	0.0000	79.5789	79.5789	1.4100e-003	0.0000	79.6141
Total	**0.0594**	**0.6597**	**0.3847**	**5.7000e-003**	**0.2648**	**2.2900e-003**	**0.2671**	**0.0738**	**2.1700e-003**	**0.0760**	**0.0000**	**537.7698**	**537.7698**	**6.2800e-003**	**0.0000**	**537.9268**

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					9.8800e-003	0.0000	9.8800e-003	1.5000e-003	0.0000	1.5000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.8181	4.1013	28.6667	0.0572		0.1392	0.1392		0.1350	0.1350	0.0000	4,983.8583	4,983.8583	1.5729	0.0000	5,023.1810
Total	**0.8181**	**4.1013**	**28.6667**	**0.0572**	**9.8800e-003**	**0.1392**	**0.1491**	**1.5000e-003**	**0.1350**	**0.1365**	**0.0000**	**4,983.8583**	**4,983.8583**	**1.5729**	**0.0000**	**5,023.1810**

3.10 Dam Facilities - Saddle Dams - 2026

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	1.4000e-004	3.4100e-003	9.4000e-004	2.0000e-005	1.3100e-003	1.0000e-005	1.3200e-003	3.4000e-004	1.0000e-005	3.5000e-004	0.0000	2.3133	2.3133	4.0000e-005	0.0000	2.3142
Vendor	0.0268	0.6366	0.1649	4.8000e-003	0.1506	1.6500e-003	0.1522	0.0434	1.5800e-003	0.0450	0.0000	455.8777	455.8777	4.8300e-003	0.0000	455.9985
Worker	0.0325	0.0197	0.2188	8.8000e-004	0.1129	6.3000e-004	0.1136	0.0300	5.8000e-004	0.0306	0.0000	79.5789	79.5789	1.4100e-003	0.0000	79.6141
Total	**0.0594**	**0.6597**	**0.3847**	**5.7000e-003**	**0.2648**	**2.2900e-003**	**0.2671**	**0.0738**	**2.1700e-003**	**0.0760**	**0.0000**	**537.7698**	**537.7698**	**6.2800e-003**	**0.0000**	**537.9268**

3.10 Dam Facilities - Saddle Dams - 2027

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					0.0220	0.0000	0.0220	3.3200e-003	0.0000	3.3200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0626	0.4430	0.5623	1.5300e-003		0.0176	0.0176		0.0164	0.0164	0.0000	133.6669	133.6669	0.0422	0.0000	134.7215
Total	**0.0626**	**0.4430**	**0.5623**	**1.5300e-003**	**0.0220**	**0.0176**	**0.0396**	**3.3200e-003**	**0.0164**	**0.0197**	**0.0000**	**133.6669**	**133.6669**	**0.0422**	**0.0000**	**134.7215**

3.10 Dam Facilities - Saddle Dams - 2027

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	9.0000e-005	2.0000e-005	0.0000	1.1600e-003	0.0000	1.1600e-003	2.8000e-004	0.0000	2.8000e-004	0.0000	0.0618	0.0618	0.0000	0.0000	0.0618
Vendor	7.1000e-004	0.0167	4.3200e-003	1.3000e-004	4.0400e-003	4.0000e-005	4.0800e-003	1.1700e-003	4.0000e-005	1.2100e-003	0.0000	12.1767	12.1767	1.3000e-004	0.0000	12.1800
Worker	8.2000e-004	4.8000e-004	5.4700e-003	2.0000e-005	3.0300e-003	2.0000e-005	3.0400e-003	8.0000e-004	1.0000e-005	8.2000e-004	0.0000	2.0624	2.0624	3.0000e-005	0.0000	2.0633
Total	**1.5300e-003**	**0.0173**	**9.8100e-003**	**1.5000e-004**	**8.2300e-003**	**6.0000e-005**	**8.2800e-003**	**2.2500e-003**	**5.0000e-005**	**2.3100e-003**	**0.0000**	**14.3009**	**14.3009**	**1.6000e-004**	**0.0000**	**14.3050**

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					9.8800e-003	0.0000	9.8800e-003	1.5000e-003	0.0000	1.5000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0219	0.1100	0.7688	1.5300e-003		3.7300e-003	3.7300e-003		3.6200e-003	3.6200e-003	0.0000	133.6667	133.6667	0.0422	0.0000	134.7213
Total	**0.0219**	**0.1100**	**0.7688**	**1.5300e-003**	**9.8800e-003**	**3.7300e-003**	**0.0136**	**1.5000e-003**	**3.6200e-003**	**5.1200e-003**	**0.0000**	**133.6667**	**133.6667**	**0.0422**	**0.0000**	**134.7213**

3.10 Dam Facilities - Saddle Dams - 2027

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	9.0000e-005	2.0000e-005	0.0000	1.1600e-003	0.0000	1.1600e-003	2.8000e-004	0.0000	2.8000e-004	0.0000	0.0618	0.0618	0.0000	0.0000	0.0618
Vendor	7.1000e-004	0.0167	4.3200e-003	1.3000e-004	4.0400e-003	4.0000e-005	4.0800e-003	1.1700e-003	4.0000e-005	1.2100e-003	0.0000	12.1767	12.1767	1.3000e-004	0.0000	12.1800
Worker	8.2000e-004	4.8000e-004	5.4700e-003	2.0000e-005	3.0300e-003	2.0000e-005	3.0400e-003	8.0000e-004	1.0000e-005	8.2000e-004	0.0000	2.0624	2.0624	3.0000e-005	0.0000	2.0633
Total	**1.5300e-003**	**0.0173**	**9.8100e-003**	**1.5000e-004**	**8.2300e-003**	**6.0000e-005**	**8.2800e-003**	**2.2500e-003**	**5.0000e-005**	**2.3100e-003**	**0.0000**	**14.3009**	**14.3009**	**1.6000e-004**	**0.0000**	**14.3050**

3.11 Dam Facilities - Main Dam - 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					7.4675	0.0000	7.4675	2.0452	0.0000	2.0452	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.1782	10.5547	8.2058	0.0230		0.4384	0.4384		0.4041	0.4041	0.0000	2,014.2058	2,014.2058	0.6445	0.0000	2,030.3193
Total	**1.1782**	**10.5547**	**8.2058**	**0.0230**	**7.4675**	**0.4384**	**7.9060**	**2.0452**	**0.4041**	**2.4494**	**0.0000**	**2,014.2058**	**2,014.2058**	**0.6445**	**0.0000**	**2,030.3193**

3.11 Dam Facilities - Main Dam - 2024

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	8.0000e-005	2.0900e-003	5.6000e-004	1.0000e-005	2.6900e-003	1.0000e-005	2.6900e-003	6.7000e-004	1.0000e-005	6.8000e-004	0.0000	1.3575	1.3575	2.0000e-005	0.0000	1.3581
Vendor	3.4800e-003	0.0830	0.0220	6.1000e-004	0.0189	2.1000e-004	0.0192	5.4600e-003	2.0000e-004	5.6700e-003	0.0000	57.8444	57.8444	6.2000e-004	0.0000	57.8597
Worker	0.0104	6.8300e-003	0.0727	2.7000e-004	0.0323	1.9000e-004	0.0325	8.5900e-003	1.7000e-004	8.7600e-003	0.0000	24.5792	24.5792	4.9000e-004	0.0000	24.5914
Total	**0.0140**	**0.0919**	**0.0952**	**8.9000e-004**	**0.0540**	**4.1000e-004**	**0.0544**	**0.0147**	**3.8000e-004**	**0.0151**	**0.0000**	**83.7811**	**83.7811**	**1.1300e-003**	**0.0000**	**83.8092**

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					3.3604	0.0000	3.3604	0.9204	0.0000	0.9204	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3604	2.0708	10.6187	0.0230		0.0742	0.0742		0.0710	0.0710	0.0000	2,014.2034	2,014.2034	0.6445	0.0000	2,030.3168
Total	**0.3604**	**2.0708**	**10.6187**	**0.0230**	**3.3604**	**0.0742**	**3.4346**	**0.9204**	**0.0710**	**0.9914**	**0.0000**	**2,014.2034**	**2,014.2034**	**0.6445**	**0.0000**	**2,030.3168**

3.11 Dam Facilities - Main Dam - 2024

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	8.0000e-005	2.0900e-003	5.6000e-004	1.0000e-005	2.6900e-003	1.0000e-005	2.6900e-003	6.7000e-004	1.0000e-005	6.8000e-004	0.0000	1.3575	1.3575	2.0000e-005	0.0000	1.3581
Vendor	3.4800e-003	0.0830	0.0220	6.1000e-004	0.0189	2.1000e-004	0.0192	5.4600e-003	2.0000e-004	5.6700e-003	0.0000	57.8444	57.8444	6.2000e-004	0.0000	57.8597
Worker	0.0104	6.8300e-003	0.0727	2.7000e-004	0.0323	1.9000e-004	0.0325	8.5900e-003	1.7000e-004	8.7600e-003	0.0000	24.5792	24.5792	4.9000e-004	0.0000	24.5914
Total	**0.0140**	**0.0919**	**0.0952**	**8.9000e-004**	**0.0540**	**4.1000e-004**	**0.0544**	**0.0147**	**3.8000e-004**	**0.0151**	**0.0000**	**83.7811**	**83.7811**	**1.1300e-003**	**0.0000**	**83.8092**

3.11 Dam Facilities - Main Dam - 2025

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					16.4555	0.0000	16.4555	6.9857	0.0000	6.9857	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.5938	38.9375	32.9227	0.0969		1.5958	1.5958		1.4715	1.4715	0.0000	8,476.1633	8,476.1633	2.7123	0.0000	8,543.9715
Total	**4.5938**	**38.9375**	**32.9227**	**0.0969**	**16.4555**	**1.5958**	**18.0513**	**6.9857**	**1.4715**	**8.4572**	**0.0000**	**8,476.1633**	**8,476.1633**	**2.7123**	**0.0000**	**8,543.9715**

3.11 Dam Facilities - Main Dam - 2025

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	3.5000e-004	8.5500e-003	2.3200e-003	6.0000e-005	2.9900e-003	2.0000e-005	3.0100e-003	7.8000e-004	2.0000e-005	8.0000e-004	0.0000	5.6824	5.6824	9.0000e-005	0.0000	5.6847
Vendor	0.0144	0.3433	0.0895	2.5500e-003	0.0797	8.8000e-004	0.0806	0.0230	8.4000e-004	0.0238	0.0000	242.3783	242.3783	2.5700e-003	0.0000	242.4425
Worker	0.0413	0.0260	0.2822	1.1000e-003	0.1361	7.8000e-004	0.1369	0.0362	7.2000e-004	0.0369	0.0000	99.3778	99.3778	1.8600e-003	0.0000	99.4242
Total	**0.0561**	**0.3778**	**0.3740**	**3.7100e-003**	**0.2188**	**1.6800e-003**	**0.2205**	**0.0599**	**1.5800e-003**	**0.0615**	**0.0000**	**347.4384**	**347.4384**	**4.5200e-003**	**0.0000**	**347.5514**

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					7.4050	0.0000	7.4050	3.1436	0.0000	3.1436	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.4828	8.1996	44.5440	0.0969		0.2889	0.2889		0.2774	0.2774	0.0000	8,476.1532	8,476.1532	2.7123	0.0000	8,543.9613
Total	**1.4828**	**8.1996**	**44.5440**	**0.0969**	**7.4050**	**0.2889**	**7.6939**	**3.1436**	**0.2774**	**3.4210**	**0.0000**	**8,476.1532**	**8,476.1532**	**2.7123**	**0.0000**	**8,543.9613**

3.11 Dam Facilities - Main Dam - 2025

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	3.5000e-004	8.5500e-003	2.3200e-003	6.0000e-005	2.9900e-003	2.0000e-005	3.0100e-003	7.8000e-004	2.0000e-005	8.0000e-004	0.0000	5.6824	5.6824	9.0000e-005	0.0000	5.6847
Vendor	0.0144	0.3433	0.0895	2.5500e-003	0.0797	8.8000e-004	0.0806	0.0230	8.4000e-004	0.0238	0.0000	242.3783	242.3783	2.5700e-003	0.0000	242.4425
Worker	0.0413	0.0260	0.2822	1.1000e-003	0.1361	7.8000e-004	0.1369	0.0362	7.2000e-004	0.0369	0.0000	99.3778	99.3778	1.8600e-003	0.0000	99.4242
Total	**0.0561**	**0.3778**	**0.3740**	**3.7100e-003**	**0.2188**	**1.6800e-003**	**0.2205**	**0.0599**	**1.5800e-003**	**0.0615**	**0.0000**	**347.4384**	**347.4384**	**4.5200e-003**	**0.0000**	**347.5514**

3.11 Dam Facilities - Main Dam - 2026

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					16.3200	0.0000	16.3200	6.9113	0.0000	6.9113	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.5410	38.4899	32.5442	0.0958		1.5775	1.5775		1.4546	1.4546	0.0000	8,378.7361	8,378.7361	2.6812	0.0000	8,445.7649
Total	**4.5410**	**38.4899**	**32.5442**	**0.0958**	**16.3200**	**1.5775**	**17.8975**	**6.9113**	**1.4546**	**8.3658**	**0.0000**	**8,378.7361**	**8,378.7361**	**2.6812**	**0.0000**	**8,445.7649**

3.11 Dam Facilities - Main Dam - 2026

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	3.4000e-004	8.2300e-003	2.2600e-003	6.0000e-005	2.9800e-003	2.0000e-005	3.0000e-003	7.8000e-004	2.0000e-005	8.0000e-004	0.0000	5.5886	5.5886	9.0000e-005	0.0000	5.5909
Vendor	0.0140	0.3331	0.0863	2.5100e-003	0.0788	8.7000e-004	0.0797	0.0227	8.3000e-004	0.0236	0.0000	238.5729	238.5729	2.5300e-003	0.0000	238.6361
Worker	0.0387	0.0235	0.2607	1.0500e-003	0.1345	7.5000e-004	0.1353	0.0358	6.9000e-004	0.0364	0.0000	94.8004	94.8004	1.6800e-003	0.0000	94.8424
Total	**0.0530**	**0.3648**	**0.3493**	**3.6200e-003**	**0.2163**	**1.6400e-003**	**0.2180**	**0.0593**	**1.5400e-003**	**0.0608**	**0.0000**	**338.9619**	**338.9619**	**4.3000e-003**	**0.0000**	**339.0694**

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					7.3440	0.0000	7.3440	3.1101	0.0000	3.1101	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.4658	8.1053	44.0320	0.0958		0.2856	0.2856		0.2742	0.2742	0.0000	8,378.7262	8,378.7262	2.6812	0.0000	8,445.7549
Total	**1.4658**	**8.1053**	**44.0320**	**0.0958**	**7.3440**	**0.2856**	**7.6296**	**3.1101**	**0.2742**	**3.3843**	**0.0000**	**8,378.7262**	**8,378.7262**	**2.6812**	**0.0000**	**8,445.7549**

3.11 Dam Facilities - Main Dam - 2026

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	3.4000e-004	8.2300e-003	2.2600e-003	6.0000e-005	2.9800e-003	2.0000e-005	3.0000e-003	7.8000e-004	2.0000e-005	8.0000e-004	0.0000	5.5886	5.5886	9.0000e-005	0.0000	5.5909
Vendor	0.0140	0.3331	0.0863	2.5100e-003	0.0788	8.7000e-004	0.0797	0.0227	8.3000e-004	0.0236	0.0000	238.5729	238.5729	2.5300e-003	0.0000	238.6361
Worker	0.0387	0.0235	0.2607	1.0500e-003	0.1345	7.5000e-004	0.1353	0.0358	6.9000e-004	0.0364	0.0000	94.8004	94.8004	1.6800e-003	0.0000	94.8424
Total	**0.0530**	**0.3648**	**0.3493**	**3.6200e-003**	**0.2163**	**1.6400e-003**	**0.2180**	**0.0593**	**1.5400e-003**	**0.0608**	**0.0000**	**338.9619**	**338.9619**	**4.3000e-003**	**0.0000**	**339.0694**

3.12 Dam Facilities - Outlet Works - 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					6.8000e-004	0.0000	6.8000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0114	0.0720	0.0389	1.2000e-004		2.6800e-003	2.6800e-003		2.6800e-003	2.6800e-003	0.0000	8.5690	8.5690	9.2000e-004	0.0000	8.5920
Total	**0.0114**	**0.0720**	**0.0389**	**1.2000e-004**	**6.8000e-004**	**2.6800e-003**	**3.3600e-003**	**1.0000e-004**	**2.6800e-003**	**2.7800e-003**	**0.0000**	**8.5690**	**8.5690**	**9.2000e-004**	**0.0000**	**8.5920**

3.12 Dam Facilities - Outlet Works - 2024

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	7.0000e-005	2.0000e-005	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0476	0.0476	0.0000	0.0000	0.0476
Vendor	1.9300e-003	0.0461	0.0122	3.4000e-004	0.0105	1.2000e-004	0.0106	3.0400e-003	1.1000e-004	3.1500e-003	0.0000	32.1358	32.1358	3.4000e-004	0.0000	32.1443
Worker	6.7000e-004	4.4000e-004	4.6400e-003	2.0000e-005	2.0600e-003	1.0000e-005	2.0800e-003	5.5000e-004	1.0000e-005	5.6000e-004	0.0000	1.5689	1.5689	3.0000e-005	0.0000	1.5697
Total	**2.6000e-003**	**0.0466**	**0.0169**	**3.6000e-004**	**0.0127**	**1.3000e-004**	**0.0128**	**3.6100e-003**	**1.2000e-004**	**3.7300e-003**	**0.0000**	**33.7522**	**33.7522**	**3.7000e-004**	**0.0000**	**33.7615**

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					3.1000e-004	0.0000	3.1000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.1400e-003	7.2000e-003	3.8900e-003	1.2000e-004		2.7000e-004	2.7000e-004		2.7000e-004	2.7000e-004	0.0000	8.5690	8.5690	9.2000e-004	0.0000	8.5920
Total	**1.1400e-003**	**7.2000e-003**	**3.8900e-003**	**1.2000e-004**	**3.1000e-004**	**2.7000e-004**	**5.8000e-004**	**5.0000e-005**	**2.7000e-004**	**3.2000e-004**	**0.0000**	**8.5690**	**8.5690**	**9.2000e-004**	**0.0000**	**8.5920**

3.12 Dam Facilities - Outlet Works - 2024

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	7.0000e-005	2.0000e-005	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0476	0.0476	0.0000	0.0000	0.0476
Vendor	1.9300e-003	0.0461	0.0122	3.4000e-004	0.0105	1.2000e-004	0.0106	3.0400e-003	1.1000e-004	3.1500e-003	0.0000	32.1358	32.1358	3.4000e-004	0.0000	32.1443
Worker	6.7000e-004	4.4000e-004	4.6400e-003	2.0000e-005	2.0600e-003	1.0000e-005	2.0800e-003	5.5000e-004	1.0000e-005	5.6000e-004	0.0000	1.5689	1.5689	3.0000e-005	0.0000	1.5697
Total	**2.6000e-003**	**0.0466**	**0.0169**	**3.6000e-004**	**0.0127**	**1.3000e-004**	**0.0128**	**3.6100e-003**	**1.2000e-004**	**3.7300e-003**	**0.0000**	**33.7522**	**33.7522**	**3.7000e-004**	**0.0000**	**33.7615**

3.12 Dam Facilities - Outlet Works - 2025

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					6.8000e-004	0.0000	6.8000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0479	0.3031	0.1637	4.9000e-004		0.0113	0.0113		0.0113	0.0113	0.0000	36.0729	36.0729	3.8700e-003	0.0000	36.1697
Total	**0.0479**	**0.3031**	**0.1637**	**4.9000e-004**	**6.8000e-004**	**0.0113**	**0.0120**	**1.0000e-004**	**0.0113**	**0.0114**	**0.0000**	**36.0729**	**36.0729**	**3.8700e-003**	**0.0000**	**36.1697**

3.12 Dam Facilities - Outlet Works - 2025

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	1.0000e-005	3.0000e-004	8.0000e-005	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.1990	0.1990	0.0000	0.0000	0.1991
Vendor	8.0000e-003	0.1907	0.0497	1.4200e-003	0.0443	4.9000e-004	0.0448	0.0128	4.7000e-004	0.0133	0.0000	134.6546	134.6546	1.4300e-003	0.0000	134.6903
Worker	2.6400e-003	1.6600e-003	0.0180	7.0000e-005	8.6900e-003	5.0000e-005	8.7400e-003	2.3100e-003	5.0000e-005	2.3500e-003	0.0000	6.3433	6.3433	1.2000e-004	0.0000	6.3462
Total	**0.0107**	**0.1927**	**0.0678**	**1.4900e-003**	**0.0531**	**5.4000e-004**	**0.0536**	**0.0151**	**5.2000e-004**	**0.0156**	**0.0000**	**141.1969**	**141.1969**	**1.5500e-003**	**0.0000**	**141.2356**

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					3.1000e-004	0.0000	3.1000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.7900e-003	0.0303	0.0164	4.9000e-004		1.1300e-003	1.1300e-003		1.1300e-003	1.1300e-003	0.0000	36.0729	36.0729	3.8700e-003	0.0000	36.1697
Total	**4.7900e-003**	**0.0303**	**0.0164**	**4.9000e-004**	**3.1000e-004**	**1.1300e-003**	**1.4400e-003**	**5.0000e-005**	**1.1300e-003**	**1.1800e-003**	**0.0000**	**36.0729**	**36.0729**	**3.8700e-003**	**0.0000**	**36.1697**

3.12 Dam Facilities - Outlet Works - 2025

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	1.0000e-005	3.0000e-004	8.0000e-005	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.1990	0.1990	0.0000	0.0000	0.1991
Vendor	8.0000e-003	0.1907	0.0497	1.4200e-003	0.0443	4.9000e-004	0.0448	0.0128	4.7000e-004	0.0133	0.0000	134.6546	134.6546	1.4300e-003	0.0000	134.6903
Worker	2.6400e-003	1.6600e-003	0.0180	7.0000e-005	8.6900e-003	5.0000e-005	8.7400e-003	2.3100e-003	5.0000e-005	2.3500e-003	0.0000	6.3433	6.3433	1.2000e-004	0.0000	6.3462
Total	**0.0107**	**0.1927**	**0.0678**	**1.4900e-003**	**0.0531**	**5.4000e-004**	**0.0536**	**0.0151**	**5.2000e-004**	**0.0156**	**0.0000**	**141.1969**	**141.1969**	**1.5500e-003**	**0.0000**	**141.2356**

3.12 Dam Facilities - Outlet Works - 2026

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					6.8000e-004	0.0000	6.8000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0253	0.1603	0.0865	2.6000e-004		5.9600e-003	5.9600e-003		5.9600e-003	5.9600e-003	0.0000	19.0730	19.0730	2.0500e-003	0.0000	19.1242
Total	**0.0253**	**0.1603**	**0.0865**	**2.6000e-004**	**6.8000e-004**	**5.9600e-003**	**6.6400e-003**	**1.0000e-004**	**5.9600e-003**	**6.0600e-003**	**0.0000**	**19.0730**	**19.0730**	**2.0500e-003**	**0.0000**	**19.1242**

3.12 Dam Facilities - Outlet Works - 2026

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	1.0000e-005	1.5000e-004	4.0000e-005	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.1047	0.1047	0.0000	0.0000	0.1047
Vendor	4.1600e-003	0.0990	0.0257	7.5000e-004	0.0234	2.6000e-004	0.0237	6.7600e-003	2.5000e-004	7.0000e-003	0.0000	70.8938	70.8938	7.5000e-004	0.0000	70.9125
Worker	1.3200e-003	8.0000e-004	8.9000e-003	4.0000e-005	4.5900e-003	3.0000e-005	4.6200e-003	1.2200e-003	2.0000e-005	1.2400e-003	0.0000	3.2366	3.2366	6.0000e-005	0.0000	3.2381
Total	**5.4900e-003**	**0.0999**	**0.0346**	**7.9000e-004**	**0.0281**	**2.9000e-004**	**0.0284**	**8.0000e-003**	**2.7000e-004**	**8.2600e-003**	**0.0000**	**74.2351**	**74.2351**	**8.1000e-004**	**0.0000**	**74.2553**

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					3.1000e-004	0.0000	3.1000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.5300e-003	0.0160	8.6500e-003	2.6000e-004		6.0000e-004	6.0000e-004		6.0000e-004	6.0000e-004	0.0000	19.0730	19.0730	2.0500e-003	0.0000	19.1242
Total	**2.5300e-003**	**0.0160**	**8.6500e-003**	**2.6000e-004**	**3.1000e-004**	**6.0000e-004**	**9.1000e-004**	**5.0000e-005**	**6.0000e-004**	**6.5000e-004**	**0.0000**	**19.0730**	**19.0730**	**2.0500e-003**	**0.0000**	**19.1242**

3.12 Dam Facilities - Outlet Works - 2026

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	1.0000e-005	1.5000e-004	4.0000e-005	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.1047	0.1047	0.0000	0.0000	0.1047
Vendor	4.1600e-003	0.0990	0.0257	7.5000e-004	0.0234	2.6000e-004	0.0237	6.7600e-003	2.5000e-004	7.0000e-003	0.0000	70.8938	70.8938	7.5000e-004	0.0000	70.9125
Worker	1.3200e-003	8.0000e-004	8.9000e-003	4.0000e-005	4.5900e-003	3.0000e-005	4.6200e-003	1.2200e-003	2.0000e-005	1.2400e-003	0.0000	3.2366	3.2366	6.0000e-005	0.0000	3.2381
Total	**5.4900e-003**	**0.0999**	**0.0346**	**7.9000e-004**	**0.0281**	**2.9000e-004**	**0.0284**	**8.0000e-003**	**2.7000e-004**	**8.2600e-003**	**0.0000**	**74.2351**	**74.2351**	**8.1000e-004**	**0.0000**	**74.2553**

3.13 Outlet Works PTs - 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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0129	0.1244	0.1555	2.4000e-004		6.4200e-003	6.4200e-003		5.9100e-003	5.9100e-003	0.0000	21.0303	21.0303	6.8000e-003	0.0000	21.2004
Total	**0.0129**	**0.1244**	**0.1555**	**2.4000e-004**	**0.0000**	**6.4200e-003**	**6.4200e-003**	**0.0000**	**5.9100e-003**	**5.9100e-003**	**0.0000**	**21.0303**	**21.0303**	**6.8000e-003**	**0.0000**	**21.2004**

3.13 Outlet Works PTs - 2024

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	6.7000e-004	4.4000e-004	4.6400e-003	2.0000e-005	2.0600e-003	1.0000e-005	2.0800e-003	5.5000e-004	1.0000e-005	5.6000e-004	0.0000	1.5689	1.5689	3.0000e-005	0.0000	1.5697
Total	**6.7000e-004**	**4.4000e-004**	**4.6400e-003**	**2.0000e-005**	**2.0600e-003**	**1.0000e-005**	**2.0800e-003**	**5.5000e-004**	**1.0000e-005**	**5.6000e-004**	**0.0000**	**1.5689**	**1.5689**	**3.0000e-005**	**0.0000**	**1.5697**

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.8500e-003	0.0229	0.1802	2.4000e-004		9.4000e-004	9.4000e-004		8.9000e-004	8.9000e-004	0.0000	21.0303	21.0303	6.8000e-003	0.0000	21.2004
Total	**3.8500e-003**	**0.0229**	**0.1802**	**2.4000e-004**	**0.0000**	**9.4000e-004**	**9.4000e-004**	**0.0000**	**8.9000e-004**	**8.9000e-004**	**0.0000**	**21.0303**	**21.0303**	**6.8000e-003**	**0.0000**	**21.2004**

3.13 Outlet Works PTs - 2024

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	6.7000e-004	4.4000e-004	4.6400e-003	2.0000e-005	2.0600e-003	1.0000e-005	2.0800e-003	5.5000e-004	1.0000e-005	5.6000e-004	0.0000	1.5689	1.5689	3.0000e-005	0.0000	1.5697
Total	**6.7000e-004**	**4.4000e-004**	**4.6400e-003**	**2.0000e-005**	**2.0600e-003**	**1.0000e-005**	**2.0800e-003**	**5.5000e-004**	**1.0000e-005**	**5.6000e-004**	**0.0000**	**1.5689**	**1.5689**	**3.0000e-005**	**0.0000**	**1.5697**

3.13 Outlet Works PTs - 2025

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0488	0.4505	0.6519	1.0100e-003		0.0233	0.0233		0.0214	0.0214	0.0000	88.5872	88.5872	0.0287	0.0000	89.3035
Total	**0.0488**	**0.4505**	**0.6519**	**1.0100e-003**	**0.0000**	**0.0233**	**0.0233**	**0.0000**	**0.0214**	**0.0214**	**0.0000**	**88.5872**	**88.5872**	**0.0287**	**0.0000**	**89.3035**

3.13 Outlet Works PTs - 2025

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	2.6400e-003	1.6600e-003	0.0180	7.0000e-005	8.6900e-003	5.0000e-005	8.7400e-003	2.3100e-003	5.0000e-005	2.3500e-003	0.0000	6.3433	6.3433	1.2000e-004	0.0000	6.3462
Total	**2.6400e-003**	**1.6600e-003**	**0.0180**	**7.0000e-005**	**8.6900e-003**	**5.0000e-005**	**8.7400e-003**	**2.3100e-003**	**5.0000e-005**	**2.3500e-003**	**0.0000**	**6.3433**	**6.3433**	**1.2000e-004**	**0.0000**	**6.3462**

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0157	0.0897	0.7585	1.0100e-003		3.6100e-003	3.6100e-003		3.4400e-003	3.4400e-003	0.0000	88.5871	88.5871	0.0287	0.0000	89.3034
Total	**0.0157**	**0.0897**	**0.7585**	**1.0100e-003**	**0.0000**	**3.6100e-003**	**3.6100e-003**	**0.0000**	**3.4400e-003**	**3.4400e-003**	**0.0000**	**88.5871**	**88.5871**	**0.0287**	**0.0000**	**89.3034**

3.13 Outlet Works PTs - 2025

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	2.6400e-003	1.6600e-003	0.0180	7.0000e-005	8.6900e-003	5.0000e-005	8.7400e-003	2.3100e-003	5.0000e-005	2.3500e-003	0.0000	6.3433	6.3433	1.2000e-004	0.0000	6.3462
Total	**2.6400e-003**	**1.6600e-003**	**0.0180**	**7.0000e-005**	**8.6900e-003**	**5.0000e-005**	**8.7400e-003**	**2.3100e-003**	**5.0000e-005**	**2.3500e-003**	**0.0000**	**6.3433**	**6.3433**	**1.2000e-004**	**0.0000**	**6.3462**

3.13 Outlet Works PTs - 2026

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0488	0.4505	0.6519	1.0100e-003		0.0233	0.0233		0.0214	0.0214	0.0000	88.5872	88.5872	0.0287	0.0000	89.3035
Total	**0.0488**	**0.4505**	**0.6519**	**1.0100e-003**	**0.0000**	**0.0233**	**0.0233**	**0.0000**	**0.0214**	**0.0214**	**0.0000**	**88.5872**	**88.5872**	**0.0287**	**0.0000**	**89.3035**

3.13 Outlet Works PTs - 2026

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	2.5000e-003	1.5100e-003	0.0168	7.0000e-005	8.6900e-003	5.0000e-005	8.7400e-003	2.3100e-003	4.0000e-005	2.3500e-003	0.0000	6.1215	6.1215	1.1000e-004	0.0000	6.1242
Total	**2.5000e-003**	**1.5100e-003**	**0.0168**	**7.0000e-005**	**8.6900e-003**	**5.0000e-005**	**8.7400e-003**	**2.3100e-003**	**4.0000e-005**	**2.3500e-003**	**0.0000**	**6.1215**	**6.1215**	**1.1000e-004**	**0.0000**	**6.1242**

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0157	0.0897	0.7585	1.0100e-003		3.6100e-003	3.6100e-003		3.4400e-003	3.4400e-003	0.0000	88.5871	88.5871	0.0287	0.0000	89.3034
Total	**0.0157**	**0.0897**	**0.7585**	**1.0100e-003**	**0.0000**	**3.6100e-003**	**3.6100e-003**	**0.0000**	**3.4400e-003**	**3.4400e-003**	**0.0000**	**88.5871**	**88.5871**	**0.0287**	**0.0000**	**89.3034**

3.13 Outlet Works PTs - 2026

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	2.5000e-003	1.5100e-003	0.0168	7.0000e-005	8.6900e-003	5.0000e-005	8.7400e-003	2.3100e-003	4.0000e-005	2.3500e-003	0.0000	6.1215	6.1215	1.1000e-004	0.0000	6.1242
Total	**2.5000e-003**	**1.5100e-003**	**0.0168**	**7.0000e-005**	**8.6900e-003**	**5.0000e-005**	**8.7400e-003**	**2.3100e-003**	**4.0000e-005**	**2.3500e-003**	**0.0000**	**6.1215**	**6.1215**	**1.1000e-004**	**0.0000**	**6.1242**

3.13 Outlet Works PTs - 2027

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0480	0.4436	0.6419	9.9000e-004		0.0229	0.0229		0.0211	0.0211	0.0000	87.2296	87.2296	0.0282	0.0000	87.9349
Total	**0.0480**	**0.4436**	**0.6419**	**9.9000e-004**	**0.0000**	**0.0229**	**0.0229**	**0.0000**	**0.0211**	**0.0211**	**0.0000**	**87.2296**	**87.2296**	**0.0282**	**0.0000**	**87.9349**

3.13 Outlet Works PTs - 2027

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	2.3200e-003	1.3600e-003	0.0154	6.0000e-005	8.5500e-003	5.0000e-005	8.6000e-003	2.2700e-003	4.0000e-005	2.3100e-003	0.0000	5.8246	5.8246	1.0000e-004	0.0000	5.8270
Total	**2.3200e-003**	**1.3600e-003**	**0.0154**	**6.0000e-005**	**8.5500e-003**	**5.0000e-005**	**8.6000e-003**	**2.2700e-003**	**4.0000e-005**	**2.3100e-003**	**0.0000**	**5.8246**	**5.8246**	**1.0000e-004**	**0.0000**	**5.8270**

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0155	0.0883	0.7468	9.9000e-004		3.5500e-003	3.5500e-003		3.3900e-003	3.3900e-003	0.0000	87.2295	87.2295	0.0282	0.0000	87.9347
Total	**0.0155**	**0.0883**	**0.7468**	**9.9000e-004**	**0.0000**	**3.5500e-003**	**3.5500e-003**	**0.0000**	**3.3900e-003**	**3.3900e-003**	**0.0000**	**87.2295**	**87.2295**	**0.0282**	**0.0000**	**87.9347**

3.13 Outlet Works PTs - 2027

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	2.3200e-003	1.3600e-003	0.0154	6.0000e-005	8.5500e-003	5.0000e-005	8.6000e-003	2.2700e-003	4.0000e-005	2.3100e-003	0.0000	5.8246	5.8246	1.0000e-004	0.0000	5.8270
Total	**2.3200e-003**	**1.3600e-003**	**0.0154**	**6.0000e-005**	**8.5500e-003**	**5.0000e-005**	**8.6000e-003**	**2.2700e-003**	**4.0000e-005**	**2.3100e-003**	**0.0000**	**5.8246**	**5.8246**	**1.0000e-004**	**0.0000**	**5.8270**

3.14 Dam Facilities - Spillway - 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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0336	0.2534	0.5255	8.6000e-004		0.0121	0.0121		0.0112	0.0112	0.0000	74.6287	74.6287	0.0232	0.0000	75.2089
Total	**0.0336**	**0.2534**	**0.5255**	**8.6000e-004**	**0.0000**	**0.0121**	**0.0121**	**0.0000**	**0.0112**	**0.0112**	**0.0000**	**74.6287**	**74.6287**	**0.0232**	**0.0000**	**75.2089**

3.14 Dam Facilities - Spillway - 2024

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	1.1600e-003	0.0277	7.3200e-003	2.0000e-004	6.3100e-003	7.0000e-005	6.3800e-003	1.8200e-003	7.0000e-005	1.8900e-003	0.0000	19.2815	19.2815	2.1000e-004	0.0000	19.2866
Worker	8.9000e-004	5.8000e-004	6.1800e-003	2.0000e-005	2.7500e-003	2.0000e-005	2.7700e-003	7.3000e-004	1.0000e-005	7.5000e-004	0.0000	2.0919	2.0919	4.0000e-005	0.0000	2.0929
Total	**2.0500e-003**	**0.0283**	**0.0135**	**2.2000e-004**	**9.0600e-003**	**9.0000e-005**	**9.1500e-003**	**2.5500e-003**	**8.0000e-005**	**2.6400e-003**	**0.0000**	**21.3733**	**21.3733**	**2.5000e-004**	**0.0000**	**21.3795**

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0115	0.0568	0.6032	8.6000e-004		2.0100e-003	2.0100e-003		1.9600e-003	1.9600e-003	0.0000	74.6286	74.6286	0.0232	0.0000	75.2088
Total	**0.0115**	**0.0568**	**0.6032**	**8.6000e-004**	**0.0000**	**2.0100e-003**	**2.0100e-003**	**0.0000**	**1.9600e-003**	**1.9600e-003**	**0.0000**	**74.6286**	**74.6286**	**0.0232**	**0.0000**	**75.2088**

3.14 Dam Facilities - Spillway - 2024

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	1.1600e-003	0.0277	7.3200e-003	2.0000e-004	6.3100e-003	7.0000e-005	6.3800e-003	1.8200e-003	7.0000e-005	1.8900e-003	0.0000	19.2815	19.2815	2.1000e-004	0.0000	19.2866
Worker	8.9000e-004	5.8000e-004	6.1800e-003	2.0000e-005	2.7500e-003	2.0000e-005	2.7700e-003	7.3000e-004	1.0000e-005	7.5000e-004	0.0000	2.0919	2.0919	4.0000e-005	0.0000	2.0929
Total	**2.0500e-003**	**0.0283**	**0.0135**	**2.2000e-004**	**9.0600e-003**	**9.0000e-005**	**9.1500e-003**	**2.5500e-003**	**8.0000e-005**	**2.6400e-003**	**0.0000**	**21.3733**	**21.3733**	**2.5000e-004**	**0.0000**	**21.3795**

3.14 Dam Facilities - Spillway - 2025

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1330	0.9487	2.2086	3.6200e-003		0.0447	0.0447		0.0416	0.0416	0.0000	314.2055	314.2055	0.0977	0.0000	316.6486
Total	**0.1330**	**0.9487**	**2.2086**	**3.6200e-003**	**0.0000**	**0.0447**	**0.0447**	**0.0000**	**0.0416**	**0.0416**	**0.0000**	**314.2055**	**314.2055**	**0.0977**	**0.0000**	**316.6486**

3.14 Dam Facilities - Spillway - 2025

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	4.8000e-003	0.1144	0.0299	8.5000e-004	0.0266	2.9000e-004	0.0269	7.6700e-003	2.8000e-004	7.9500e-003	0.0000	80.7928	80.7928	8.6000e-004	0.0000	80.8142
Worker	3.5100e-003	2.2100e-003	0.0240	9.0000e-005	0.0116	7.0000e-005	0.0117	3.0800e-003	6.0000e-005	3.1400e-003	0.0000	8.4577	8.4577	1.6000e-004	0.0000	8.4616
Total	**8.3100e-003**	**0.1166**	**0.0539**	**9.4000e-004**	**0.0382**	**3.6000e-004**	**0.0385**	**0.0108**	**3.4000e-004**	**0.0111**	**0.0000**	**89.2504**	**89.2504**	**1.0200e-003**	**0.0000**	**89.2758**

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0479	0.2319	2.5389	3.6200e-003		8.1000e-003	8.1000e-003		7.9200e-003	7.9200e-003	0.0000	314.2051	314.2051	0.0977	0.0000	316.6482
Total	**0.0479**	**0.2319**	**2.5389**	**3.6200e-003**	**0.0000**	**8.1000e-003**	**8.1000e-003**	**0.0000**	**7.9200e-003**	**7.9200e-003**	**0.0000**	**314.2051**	**314.2051**	**0.0977**	**0.0000**	**316.6482**

3.14 Dam Facilities - Spillway - 2025

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	4.8000e-003	0.1144	0.0299	8.5000e-004	0.0266	2.9000e-004	0.0269	7.6700e-003	2.8000e-004	7.9500e-003	0.0000	80.7928	80.7928	8.6000e-004	0.0000	80.8142
Worker	3.5100e-003	2.2100e-003	0.0240	9.0000e-005	0.0116	7.0000e-005	0.0117	3.0800e-003	6.0000e-005	3.1400e-003	0.0000	8.4577	8.4577	1.6000e-004	0.0000	8.4616
Total	**8.3100e-003**	**0.1166**	**0.0539**	**9.4000e-004**	**0.0382**	**3.6000e-004**	**0.0385**	**0.0108**	**3.4000e-004**	**0.0111**	**0.0000**	**89.2504**	**89.2504**	**1.0200e-003**	**0.0000**	**89.2758**

3.14 Dam Facilities - Spillway - 2026

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1330	0.9487	2.2086	3.6200e-003		0.0447	0.0447		0.0416	0.0416	0.0000	314.2055	314.2055	0.0977	0.0000	316.6486
Total	**0.1330**	**0.9487**	**2.2086**	**3.6200e-003**	**0.0000**	**0.0447**	**0.0447**	**0.0000**	**0.0416**	**0.0416**	**0.0000**	**314.2055**	**314.2055**	**0.0977**	**0.0000**	**316.6486**

3.14 Dam Facilities - Spillway - 2026

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	4.7200e-003	0.1123	0.0291	8.5000e-004	0.0266	2.9000e-004	0.0269	7.6700e-003	2.8000e-004	7.9500e-003	0.0000	80.4490	80.4490	8.5000e-004	0.0000	80.4703
Worker	3.3300e-003	2.0200e-003	0.0225	9.0000e-005	0.0116	6.0000e-005	0.0117	3.0800e-003	6.0000e-005	3.1400e-003	0.0000	8.1619	8.1619	1.4000e-004	0.0000	8.1656
Total	**8.0500e-003**	**0.1144**	**0.0516**	**9.4000e-004**	**0.0382**	**3.5000e-004**	**0.0385**	**0.0108**	**3.4000e-004**	**0.0111**	**0.0000**	**88.6109**	**88.6109**	**9.9000e-004**	**0.0000**	**88.6359**

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0479	0.2319	2.5389	3.6200e-003		8.1000e-003	8.1000e-003		7.9200e-003	7.9200e-003	0.0000	314.2051	314.2051	0.0977	0.0000	316.6482
Total	**0.0479**	**0.2319**	**2.5389**	**3.6200e-003**	**0.0000**	**8.1000e-003**	**8.1000e-003**	**0.0000**	**7.9200e-003**	**7.9200e-003**	**0.0000**	**314.2051**	**314.2051**	**0.0977**	**0.0000**	**316.6482**

3.14 Dam Facilities - Spillway - 2026

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	4.7200e-003	0.1123	0.0291	8.5000e-004	0.0266	2.9000e-004	0.0269	7.6700e-003	2.8000e-004	7.9500e-003	0.0000	80.4490	80.4490	8.5000e-004	0.0000	80.4703
Worker	3.3300e-003	2.0200e-003	0.0225	9.0000e-005	0.0116	6.0000e-005	0.0117	3.0800e-003	6.0000e-005	3.1400e-003	0.0000	8.1619	8.1619	1.4000e-004	0.0000	8.1656
Total	**8.0500e-003**	**0.1144**	**0.0516**	**9.4000e-004**	**0.0382**	**3.5000e-004**	**0.0385**	**0.0108**	**3.4000e-004**	**0.0111**	**0.0000**	**88.6109**	**88.6109**	**9.9000e-004**	**0.0000**	**88.6359**

3.14 Dam Facilities - Spillway - 2027

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0494	0.3526	0.8208	1.3400e-003		0.0166	0.0166		0.0155	0.0155	0.0000	116.7737	116.7737	0.0363	0.0000	117.6817
Total	**0.0494**	**0.3526**	**0.8208**	**1.3400e-003**	**0.0000**	**0.0166**	**0.0166**	**0.0000**	**0.0155**	**0.0155**	**0.0000**	**116.7737**	**116.7737**	**0.0363**	**0.0000**	**117.6817**

3.14 Dam Facilities - Spillway - 2027

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	1.7300e-003	0.0409	0.0106	3.1000e-004	9.8700e-003	1.1000e-004	9.9800e-003	2.8500e-003	1.0000e-004	2.9500e-003	0.0000	29.7767	29.7767	3.2000e-004	0.0000	29.7846
Worker	1.1700e-003	6.9000e-004	7.7700e-003	3.0000e-005	4.3000e-003	2.0000e-005	4.3300e-003	1.1400e-003	2.0000e-005	1.1600e-003	0.0000	2.9312	2.9312	5.0000e-005	0.0000	2.9324
Total	**2.9000e-003**	**0.0416**	**0.0183**	**3.4000e-004**	**0.0142**	**1.3000e-004**	**0.0143**	**3.9900e-003**	**1.2000e-004**	**4.1100e-003**	**0.0000**	**32.7079**	**32.7079**	**3.7000e-004**	**0.0000**	**32.7170**

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0178	0.0862	0.9436	1.3400e-003		3.0100e-003	3.0100e-003		2.9400e-003	2.9400e-003	0.0000	116.7735	116.7735	0.0363	0.0000	117.6815
Total	**0.0178**	**0.0862**	**0.9436**	**1.3400e-003**	**0.0000**	**3.0100e-003**	**3.0100e-003**	**0.0000**	**2.9400e-003**	**2.9400e-003**	**0.0000**	**116.7735**	**116.7735**	**0.0363**	**0.0000**	**117.6815**

3.14 Dam Facilities - Spillway - 2027

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	1.7300e-003	0.0409	0.0106	3.1000e-004	9.8700e-003	1.1000e-004	9.9800e-003	2.8500e-003	1.0000e-004	2.9500e-003	0.0000	29.7767	29.7767	3.2000e-004	0.0000	29.7846
Worker	1.1700e-003	6.9000e-004	7.7700e-003	3.0000e-005	4.3000e-003	2.0000e-005	4.3300e-003	1.1400e-003	2.0000e-005	1.1600e-003	0.0000	2.9312	2.9312	5.0000e-005	0.0000	2.9324
Total	**2.9000e-003**	**0.0416**	**0.0183**	**3.4000e-004**	**0.0142**	**1.3000e-004**	**0.0143**	**3.9900e-003**	**1.2000e-004**	**4.1100e-003**	**0.0000**	**32.7079**	**32.7079**	**3.7000e-004**	**0.0000**	**32.7170**

3.15 Conveyance - Open Cut Trench - 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					4.8400e-003	0.0000	4.8400e-003	1.9300e-003	0.0000	1.9300e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.2300e-003	0.0333	0.0363	8.0000e-005		1.4100e-003	1.4100e-003		1.3500e-003	1.3500e-003	0.0000	6.6893	6.6893	1.4800e-003	0.0000	6.7263
Total	**4.2300e-003**	**0.0333**	**0.0363**	**8.0000e-005**	**4.8400e-003**	**1.4100e-003**	**6.2500e-003**	**1.9300e-003**	**1.3500e-003**	**3.2800e-003**	**0.0000**	**6.6893**	**6.6893**	**1.4800e-003**	**0.0000**	**6.7263**

3.15 Conveyance - Open Cut Trench - 2024

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	1.0000e-005	1.9000e-004	5.0000e-005	0.0000	9.9000e-004	0.0000	9.9000e-004	2.4000e-004	0.0000	2.5000e-004	0.0000	0.1205	0.1205	0.0000	0.0000	0.1206
Vendor	1.0000e-004	2.3800e-003	6.3000e-004	2.0000e-005	5.4000e-004	1.0000e-005	5.5000e-004	1.6000e-004	1.0000e-005	1.6000e-004	0.0000	1.6586	1.6586	2.0000e-005	0.0000	1.6591
Worker	6.0000e-005	4.0000e-005	4.0000e-004	0.0000	1.8000e-004	0.0000	1.8000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.1350	0.1350	0.0000	0.0000	0.1350
Total	**1.7000e-004**	**2.6100e-003**	**1.0800e-003**	**2.0000e-005**	**1.7100e-003**	**1.0000e-005**	**1.7200e-003**	**4.5000e-004**	**1.0000e-005**	**4.6000e-004**	**0.0000**	**1.9141**	**1.9141**	**2.0000e-005**	**0.0000**	**1.9147**

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					2.1800e-003	0.0000	2.1800e-003	8.7000e-004	0.0000	8.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0100e-003	5.3600e-003	0.0390	8.0000e-005		1.9000e-004	1.9000e-004		1.8000e-004	1.8000e-004	0.0000	6.6893	6.6893	1.4800e-003	0.0000	6.7263
Total	**1.0100e-003**	**5.3600e-003**	**0.0390**	**8.0000e-005**	**2.1800e-003**	**1.9000e-004**	**2.3700e-003**	**8.7000e-004**	**1.8000e-004**	**1.0500e-003**	**0.0000**	**6.6893**	**6.6893**	**1.4800e-003**	**0.0000**	**6.7263**

3.15 Conveyance - Open Cut Trench - 2024

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	1.0000e-005	1.9000e-004	5.0000e-005	0.0000	9.9000e-004	0.0000	9.9000e-004	2.4000e-004	0.0000	2.5000e-004	0.0000	0.1205	0.1205	0.0000	0.0000	0.1206
Vendor	1.0000e-004	2.3800e-003	6.3000e-004	2.0000e-005	5.4000e-004	1.0000e-005	5.5000e-004	1.6000e-004	1.0000e-005	1.6000e-004	0.0000	1.6586	1.6586	2.0000e-005	0.0000	1.6591
Worker	6.0000e-005	4.0000e-005	4.0000e-004	0.0000	1.8000e-004	0.0000	1.8000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.1350	0.1350	0.0000	0.0000	0.1350
Total	**1.7000e-004**	**2.6100e-003**	**1.0800e-003**	**2.0000e-005**	**1.7100e-003**	**1.0000e-005**	**1.7200e-003**	**4.5000e-004**	**1.0000e-005**	**4.6000e-004**	**0.0000**	**1.9141**	**1.9141**	**2.0000e-005**	**0.0000**	**1.9147**

3.15 Conveyance - Open Cut Trench - 2025

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					0.1208	0.0000	0.1208	0.0657	0.0000	0.0657	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1599	1.2274	1.4236	3.1100e-003		0.0499	0.0499		0.0478	0.0478	0.0000	264.2290	264.2290	0.0583	0.0000	265.6852
Total	**0.1599**	**1.2274**	**1.4236**	**3.1100e-003**	**0.1208**	**0.0499**	**0.1707**	**0.0657**	**0.0478**	**0.1135**	**0.0000**	**264.2290**	**264.2290**	**0.0583**	**0.0000**	**265.6852**

3.15 Conveyance - Open Cut Trench - 2025

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	2.9000e-004	7.1200e-003	1.9300e-003	5.0000e-005	1.3100e-003	2.0000e-005	1.3300e-003	3.6000e-004	2.0000e-005	3.8000e-004	0.0000	4.7339	4.7339	8.0000e-005	0.0000	4.7358
Vendor	3.8700e-003	0.0924	0.0241	6.9000e-004	0.0215	2.4000e-004	0.0217	6.1900e-003	2.3000e-004	6.4100e-003	0.0000	65.2120	65.2120	6.9000e-004	0.0000	65.2293
Worker	2.1300e-003	1.3400e-003	0.0145	6.0000e-005	7.0100e-003	4.0000e-005	7.0500e-003	1.8600e-003	4.0000e-005	1.9000e-003	0.0000	5.1200	5.1200	1.0000e-004	0.0000	5.1224
Total	**6.2900e-003**	**0.1008**	**0.0406**	**8.0000e-004**	**0.0298**	**3.0000e-004**	**0.0301**	**8.4100e-003**	**2.9000e-004**	**8.6900e-003**	**0.0000**	**75.0659**	**75.0659**	**8.7000e-004**	**0.0000**	**75.0875**

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					0.0544	0.0000	0.0544	0.0295	0.0000	0.0295	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0395	0.2059	1.5406	3.1100e-003		7.1000e-003	7.1000e-003		6.9300e-003	6.9300e-003	0.0000	264.2287	264.2287	0.0583	0.0000	265.6849
Total	**0.0395**	**0.2059**	**1.5406**	**3.1100e-003**	**0.0544**	**7.1000e-003**	**0.0615**	**0.0295**	**6.9300e-003**	**0.0365**	**0.0000**	**264.2287**	**264.2287**	**0.0583**	**0.0000**	**265.6849**

3.15 Conveyance - Open Cut Trench - 2025

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	2.9000e-004	7.1200e-003	1.9300e-003	5.0000e-005	1.3100e-003	2.0000e-005	1.3300e-003	3.6000e-004	2.0000e-005	3.8000e-004	0.0000	4.7339	4.7339	8.0000e-005	0.0000	4.7358
Vendor	3.8700e-003	0.0924	0.0241	6.9000e-004	0.0215	2.4000e-004	0.0217	6.1900e-003	2.3000e-004	6.4100e-003	0.0000	65.2120	65.2120	6.9000e-004	0.0000	65.2293
Worker	2.1300e-003	1.3400e-003	0.0145	6.0000e-005	7.0100e-003	4.0000e-005	7.0500e-003	1.8600e-003	4.0000e-005	1.9000e-003	0.0000	5.1200	5.1200	1.0000e-004	0.0000	5.1224
Total	**6.2900e-003**	**0.1008**	**0.0406**	**8.0000e-004**	**0.0298**	**3.0000e-004**	**0.0301**	**8.4100e-003**	**2.9000e-004**	**8.6900e-003**	**0.0000**	**75.0659**	**75.0659**	**8.7000e-004**	**0.0000**	**75.0875**

3.16 Open Cut Trench PTs - 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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.2000e-004	6.0200e-003	7.5200e-003	1.0000e-005		3.1000e-004	3.1000e-004		2.9000e-004	2.9000e-004	0.0000	1.0176	1.0176	3.3000e-004	0.0000	1.0258
Total	**6.2000e-004**	**6.0200e-003**	**7.5200e-003**	**1.0000e-005**	**0.0000**	**3.1000e-004**	**3.1000e-004**	**0.0000**	**2.9000e-004**	**2.9000e-004**	**0.0000**	**1.0176**	**1.0176**	**3.3000e-004**	**0.0000**	**1.0258**

3.16 Open Cut Trench PTs - 2024

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	3.0000e-005	2.0000e-005	2.0000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0675	0.0675	0.0000	0.0000	0.0675
Total	**3.0000e-005**	**2.0000e-005**	**2.0000e-004**	**0.0000**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0675**	**0.0675**	**0.0000**	**0.0000**	**0.0675**

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.9000e-004	1.1100e-003	8.7200e-003	1.0000e-005		5.0000e-005	5.0000e-005		4.0000e-005	4.0000e-005	0.0000	1.0176	1.0176	3.3000e-004	0.0000	1.0258
Total	**1.9000e-004**	**1.1100e-003**	**8.7200e-003**	**1.0000e-005**	**0.0000**	**5.0000e-005**	**5.0000e-005**	**0.0000**	**4.0000e-005**	**4.0000e-005**	**0.0000**	**1.0176**	**1.0176**	**3.3000e-004**	**0.0000**	**1.0258**

3.16 Open Cut Trench PTs - 2024

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	3.0000e-005	2.0000e-005	2.0000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0675	0.0675	0.0000	0.0000	0.0675
Total	**3.0000e-005**	**2.0000e-005**	**2.0000e-004**	**0.0000**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0675**	**0.0675**	**0.0000**	**0.0000**	**0.0675**

3.16 Open Cut Trench PTs - 2025

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0732	0.6757	0.9778	1.5100e-003		0.0349	0.0349		0.0322	0.0322	0.0000	132.8808	132.8808	0.0430	0.0000	133.9552
Total	**0.0732**	**0.6757**	**0.9778**	**1.5100e-003**	**0.0000**	**0.0349**	**0.0349**	**0.0000**	**0.0322**	**0.0322**	**0.0000**	**132.8808**	**132.8808**	**0.0430**	**0.0000**	**133.9552**

3.16 Open Cut Trench PTs - 2025

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	3.5100e-003	2.2100e-003	0.0240	9.0000e-005	0.0116	7.0000e-005	0.0117	3.0800e-003	6.0000e-005	3.1400e-003	0.0000	8.4577	8.4577	1.6000e-004	0.0000	8.4616
Total	**3.5100e-003**	**2.2100e-003**	**0.0240**	**9.0000e-005**	**0.0116**	**7.0000e-005**	**0.0117**	**3.0800e-003**	**6.0000e-005**	**3.1400e-003**	**0.0000**	**8.4577**	**8.4577**	**1.6000e-004**	**0.0000**	**8.4616**

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0236	0.1346	1.1377	1.5100e-003		5.4100e-003	5.4100e-003		5.1600e-003	5.1600e-003	0.0000	132.8807	132.8807	0.0430	0.0000	133.9551
Total	**0.0236**	**0.1346**	**1.1377**	**1.5100e-003**	**0.0000**	**5.4100e-003**	**5.4100e-003**	**0.0000**	**5.1600e-003**	**5.1600e-003**	**0.0000**	**132.8807**	**132.8807**	**0.0430**	**0.0000**	**133.9551**

3.16 Open Cut Trench PTs - 2025

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	3.5100e-003	2.2100e-003	0.0240	9.0000e-005	0.0116	7.0000e-005	0.0117	3.0800e-003	6.0000e-005	3.1400e-003	0.0000	8.4577	8.4577	1.6000e-004	0.0000	8.4616
Total	**3.5100e-003**	**2.2100e-003**	**0.0240**	**9.0000e-005**	**0.0116**	**7.0000e-005**	**0.0117**	**3.0800e-003**	**6.0000e-005**	**3.1400e-003**	**0.0000**	**8.4577**	**8.4577**	**1.6000e-004**	**0.0000**	**8.4616**

3.16 Open Cut Trench PTs - 2026

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0107	0.0984	0.1424	2.2000e-004		5.0900e-003	5.0900e-003		4.6800e-003	4.6800e-003	0.0000	19.3466	19.3466	6.2600e-003	0.0000	19.5031
Total	**0.0107**	**0.0984**	**0.1424**	**2.2000e-004**	**0.0000**	**5.0900e-003**	**5.0900e-003**	**0.0000**	**4.6800e-003**	**4.6800e-003**	**0.0000**	**19.3466**	**19.3466**	**6.2600e-003**	**0.0000**	**19.5031**

3.16 Open Cut Trench PTs - 2026

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	4.8000e-004	2.9000e-004	3.2700e-003	1.0000e-005	1.6900e-003	1.0000e-005	1.7000e-003	4.5000e-004	1.0000e-005	4.6000e-004	0.0000	1.1883	1.1883	2.0000e-005	0.0000	1.1889
Total	**4.8000e-004**	**2.9000e-004**	**3.2700e-003**	**1.0000e-005**	**1.6900e-003**	**1.0000e-005**	**1.7000e-003**	**4.5000e-004**	**1.0000e-005**	**4.6000e-004**	**0.0000**	**1.1883**	**1.1883**	**2.0000e-005**	**0.0000**	**1.1889**

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.4400e-003	0.0196	0.1656	2.2000e-004		7.9000e-004	7.9000e-004		7.5000e-004	7.5000e-004	0.0000	19.3466	19.3466	6.2600e-003	0.0000	19.5030
Total	**3.4400e-003**	**0.0196**	**0.1656**	**2.2000e-004**	**0.0000**	**7.9000e-004**	**7.9000e-004**	**0.0000**	**7.5000e-004**	**7.5000e-004**	**0.0000**	**19.3466**	**19.3466**	**6.2600e-003**	**0.0000**	**19.5030**

3.16 Open Cut Trench PTs - 2026

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	4.8000e-004	2.9000e-004	3.2700e-003	1.0000e-005	1.6900e-003	1.0000e-005	1.7000e-003	4.5000e-004	1.0000e-005	4.6000e-004	0.0000	1.1883	1.1883	2.0000e-005	0.0000	1.1889
Total	**4.8000e-004**	**2.9000e-004**	**3.2700e-003**	**1.0000e-005**	**1.6900e-003**	**1.0000e-005**	**1.7000e-003**	**4.5000e-004**	**1.0000e-005**	**4.6000e-004**	**0.0000**	**1.1883**	**1.1883**	**2.0000e-005**	**0.0000**	**1.1889**

3.17 Dam Facilities - Site Restoration - 2027

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					0.1074	0.0000	0.1074	0.0116	0.0000	0.0116	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1102	1.0487	0.6715	2.0100e-003		0.0360	0.0360		0.0338	0.0338	0.0000	170.9168	170.9168	0.0497	0.0000	172.1604
Total	**0.1102**	**1.0487**	**0.6715**	**2.0100e-003**	**0.1074**	**0.0360**	**0.1434**	**0.0116**	**0.0338**	**0.0453**	**0.0000**	**170.9168**	**170.9168**	**0.0497**	**0.0000**	**172.1604**

3.17 Dam Facilities - Site Restoration - 2027

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	9.6000e-004	0.0228	5.8800e-003	1.7000e-004	5.5000e-003	6.0000e-005	5.5600e-003	1.5900e-003	6.0000e-005	1.6400e-003	0.0000	16.5767	16.5767	1.8000e-004	0.0000	16.5811
Worker	2.4400e-003	1.4300e-003	0.0162	7.0000e-005	8.9900e-003	5.0000e-005	9.0300e-003	2.3900e-003	4.0000e-005	2.4300e-003	0.0000	6.1192	6.1192	1.0000e-004	0.0000	6.1218
Total	**3.4000e-003**	**0.0242**	**0.0221**	**2.4000e-004**	**0.0145**	**1.1000e-004**	**0.0146**	**3.9800e-003**	**1.0000e-004**	**4.0700e-003**	**0.0000**	**22.6959**	**22.6959**	**2.8000e-004**	**0.0000**	**22.7029**

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					0.0483	0.0000	0.0483	5.2200e-003	0.0000	5.2200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0291	0.1816	0.8230	2.0100e-003		5.9300e-003	5.9300e-003		5.7200e-003	5.7200e-003	0.0000	170.9166	170.9166	0.0497	0.0000	172.1602
Total	**0.0291**	**0.1816**	**0.8230**	**2.0100e-003**	**0.0483**	**5.9300e-003**	**0.0543**	**5.2200e-003**	**5.7200e-003**	**0.0109**	**0.0000**	**170.9166**	**170.9166**	**0.0497**	**0.0000**	**172.1602**

3.17 Dam Facilities - Site Restoration - 2027

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	9.6000e-004	0.0228	5.8800e-003	1.7000e-004	5.5000e-003	6.0000e-005	5.5600e-003	1.5900e-003	6.0000e-005	1.6400e-003	0.0000	16.5767	16.5767	1.8000e-004	0.0000	16.5811
Worker	2.4400e-003	1.4300e-003	0.0162	7.0000e-005	8.9900e-003	5.0000e-005	9.0300e-003	2.3900e-003	4.0000e-005	2.4300e-003	0.0000	6.1192	6.1192	1.0000e-004	0.0000	6.1218
Total	**3.4000e-003**	**0.0242**	**0.0221**	**2.4000e-004**	**0.0145**	**1.1000e-004**	**0.0146**	**3.9800e-003**	**1.0000e-004**	**4.0700e-003**	**0.0000**	**22.6959**	**22.6959**	**2.8000e-004**	**0.0000**	**22.7029**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	3.7300e-003	0.0405	0.0428	2.8000e-004	0.0207	1.5000e-004	0.0209	5.5600e-003	1.4000e-004	5.7100e-003	0.0000	25.8853	25.8853	1.2000e-003	0.0000	25.9152
Unmitigated	3.7300e-003	0.0405	0.0428	2.8000e-004	0.0207	1.5000e-004	0.0209	5.5600e-003	1.4000e-004	5.7100e-003	0.0000	25.8853	25.8853	1.2000e-003	0.0000	25.9152

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Refrigerated Warehouse-No Rail	14.09	14.09	14.09	54,422	54,422
Total	14.09	14.09	14.09	54,422	54,422

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Refrigerated Warehouse-No Rail	14.70	6.60	6.60	59.00	0.00	41.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Refrigerated Warehouse-No Rail	0.537520	0.029773	0.176471	0.099171	0.012038	0.003953	0.020335	0.111406	0.001746	0.001309	0.004863	0.000878	0.000539

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	14,493.7974	14,493.7974	0.5321	0.1101	14,539.9024
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	14,493.7974	14,493.7974	0.5321	0.1101	14,539.9024
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Refrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Refrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Refrigerated Warehouse-No Rail	4.04473e+007	14,493.7974	0.5321	0.1101	14,539.9024
Total		**14,493.7974**	**0.5321**	**0.1101**	**14,539.9024**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Refrigerated Warehouse-No Rail	4.04473e +007	14,493.79 74	0.5321	0.1101	14,539.90 24
Total		**14,493.79 74**	**0.5321**	**0.1101**	**14,539.90 24**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0132	1.0600e-003	0.1171	1.0000e-005		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004	0.0000	0.2284	0.2284	5.9000e-004	0.0000	0.2432
Unmitigated	0.0132	1.0600e-003	0.1171	1.0000e-005		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004	0.0000	0.2284	0.2284	5.9000e-004	0.0000	0.2432

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	2.4500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0108	1.0600e-003	0.1171	1.0000e-005		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004	0.0000	0.2284	0.2284	5.9000e-004	0.0000	0.2432
Total	**0.0132**	**1.0600e-003**	**0.1171**	**1.0000e-005**		**4.2000e-004**	**4.2000e-004**		**4.2000e-004**	**4.2000e-004**	**0.0000**	**0.2284**	**0.2284**	**5.9000e-004**	**0.0000**	**0.2432**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	2.4500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0108	1.0600e-003	0.1171	1.0000e-005		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004	0.0000	0.2284	0.2284	5.9000e-004	0.0000	0.2432
Total	**0.0132**	**1.0600e-003**	**0.1171**	**1.0000e-005**		**4.2000e-004**	**4.2000e-004**		**4.2000e-004**	**4.2000e-004**	**0.0000**	**0.2284**	**0.2284**	**5.9000e-004**	**0.0000**	**0.2432**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Refrigerated Warehouse-No Rail	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Refrigerated Warehouse-No Rail	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Refrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Refrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX E: **Geotechnical Memorandum**

Del Puerto Canyon Reservoir, Site 3 85 TAF Project

Technical Memorandum

Task 6.3.1 Compile and Review Project Data and Conduct Site Reconnaissance
Input for CEQA documentation – Geology, Soils, Minerals, Seismic
Gannett Fleming Project 65294
September 19, 2019 (rev01)

This technical memorandum has been prepared in accordance with the requirements of Woodard & Curran, Inc. and Gannett Fleming, Inc. subconsultant agreement dated June 20, 2019 (Revision 5).

This technical memorandum provides a summary of the regional and site geology, soils, seismicity, and geologic hazards of the Project Area. This information was developed to support CEQA documentation/permits being prepared by Woodard & Curran.

1. GEOLOGY

This section describes the regional and site geology for the Project Area.

1.1. Geomorphic Provinces

The state of California's landscape is divided into naturally defined geologic regions that display a distinct landscape or landform. These regions, or geomorphic provinces, display defining features based on geology, faults, topographic relief, and climate. Figure 1 shows the areas of the eleven geomorphic provinces of California and the location of the Del Puerto Canyon Reservoir Project (Project) with respect to these provinces (California Geological Survey, 2002). The Project is located along the eastern margin of the Coast Ranges and the western edge of the San Joaquin Valley. Figure 2 shows the distribution of major rock types of the Great Valley and the Coast Ranges in the project region.

1.1.1. Coast Ranges Geomorphic Province

The Coast Ranges Geomorphic Province is distinguished by a series of tectonically controlled north-northwest trending ranges and valleys and extends for approximately 960 km (597 mi) from Point Arguello northward to the Klamath Mountains, ranging in width from a few km to over 100 km (62mi). The proposed project is located on the eastern flank of the Diablo Range, a mountain range within the Coast Range Geomorphic Province that extends southeast from the Carquinez Strait to Antelope Valley; bound on the northeast by the San Joaquin River, on the southeast by the San Joaquin Valley, on the southwest by the Salinas River, and on the northwest by Santa Clara Valley (Feature Detail Report for: Diablo Range, 1981: https://geonames.usgs.gov/apex/f?p=gnispq:3:0::NO::P3_FID:238329 (accessed July 2019)). The extent of the Diablo Range in Northern California is illustrated on Figure 3.

The geology of the eastern flank of the Coast Range within the study area consists of a sequence of faulted, folded, and in some cases mildly metamorphosed Upper Mesozoic (65 to 145 [million years ago] Ma) primarily marine sedimentary rocks known as the Great Valley Sequence (GVS) which rests unconformably on the underlying Franciscan Complex, an assemblage of metamorphosed Jurassic-aged sedimentary and igneous rocks (Bartow, 1990). Outcrops of the Mesozoic units of the GVS are found upslope of the younger Cenozoic (66 Ma to present time) marine and terrestrial sedimentary units that underlie the lower elevations of the project area.

1.1.2. Great Valley Geomorphic Province

The Great Valley Geomorphic Province is a nearly featureless alluvial plain that extends north-northwest from the Tehachapi Mountains for approximately 700 km (440 mi) to the Cascade Range and covers an area of approximately 47,000 km^2 (18,000 mi^2). The valley contains the San Joaquin River drainage to the south of the Sacramento-San Joaquin Delta and the Sacramento River drainage to the north (California Geological Survey, 2002).

As described by Bartow (1990), the Great Valley sequence of the eastern Diablo Range and northern San Joaquin Valley consists of a thick accumulation of marine and nonmarine clastic rocks of Jurassic to early Paleocene age. These sediments were deposited in a forearc basin that began developing in the late Jurassic (~145 Ma) between the then-uplifting Sierra Nevada magmatic arc to the east and the Franciscan subduction complex to the west. Sedimentation in the basin began around this time and continued with little interruption through the Cretaceous and into the early Paleocene. Outcrops of the Great Valley Sequence in the Diablo Range consist primarily of submarine-fan, basin-plain, and slope deposits of sandstones, conglomerates, shales, and mudstones. Figure 4 is a cross-section showing the overall geology and structure of the subsurface near the Project Area; the surface location of the cross-section is indicated in Figure 3.

1.2. Project Area Geology

The proposed Del Puerto Canyon Reservoir project is located approximately 7 km (4 miles) northwest of the City of Patterson, CA, in southwest Stanislaus County (County). The central and eastern parts of the County consist of primarily flat and gently sloping land, while southwest and west County are marked by steeply sloping uplands. Stanislaus County is bound to the north by the Stanislaus River and San Joaquin County, to the east by Calaveras and Tuolumne Counties, to the south by Merced County, and to the west by Santa Clara County. The project itself is located at the margin of the Coast Ranges and Great Valley Geomorphic Provinces, where the topography is a combination of flat terrain to the east and hilly terrain to the west, with the reservoir and main dam located roughly at the inflection point between plains and uplands. The elevation of the creek bed near the proposed main dam is approximately 60 m (195 feet) above mean sea level. While the bedrock geology of the area has been mapped by numerous workers and the naming system for these units has been subject to revision (e.g. Bishop, 1970; Bartow, 1985; Dibblee, 2007), the unit descriptions and age estimations are generally consistent among the published literature. For the purposes of this study, we use the naming convention implemented by Bartow (1985) for all rock units is used. The names and ages along with a summary level description of the rock units mapped by Bartow (1999) within the Project Area is provided below.

The plains to the east of the project consist of Quaternary and Pleistocene fan deposits, landslides, conglomerate, and other alluvial gravel, sand, and clay deposits shed from the Sierra Nevada. These younger sediments overlie the Great Valley Sequence (GVS), strata consisting of well-bedded mudstone, siltstone, sandstone, and conglomerate that range in age from Late Jurassic to Late Cretaceous (145 – 66 Ma). Locally, the GVS structurally overlies the Jurassic-aged Franciscan assemblage, an accretionary complex which consists of graywacke and metagraywacke units that are separated by zones of mélange.

The upland terrane to the west of the project is composed of Paleocene- to Pliocene-aged marine and terrestrial sedimentary rocks, mantled by Quaternary-aged alluvium, colluvium, and landslide material.

These younger units overlie the GVS, which in turn overlies the Franciscan assemblage, an accretionary complex which consists locally of graywacke and metagraywacke units that are separated by zones of mélange. Overall, the units in the upland terrane dip between 30°-60° downslope towards the east-northeast and increase in age with elevation.

Bedrock at the main dam embankments consists of units of mudstone, siltstone, and sandstone units of the 1900-m-thick (6200 feet), Paleocene- to Eocene-aged Tesla formation. Directly upslope, the Tesla formation unconformably overlies the Upper Cretaceous-aged Panoche formation, a marine sedimentary formation consisting of conglomerates, sandstones, siltstones, and claystones with occasional limestone beds, with a total thickness of 5,440 m (17,850 feet) (Bishop, 1970). The local geology, including landslides and a footprint of the proposed reservoir, are shown in Figure 5.

1.2.1. Mesozoic-Age Rocks

Coast Range Ophiolite (Middle-Late Jurassic)

Remnants of middle Jurassic oceanic lithosphere and Late Jurassic fine-grained extrusive and volcaniclastic sediments intruded by Late Jurassic mafic sheeted dikes, overprinted by hydrothermal metamorphism (Hopson, 2008). Localized, discontinuous outcrops of the CRO are mapped to the west and the southwest, beyond the Project.

Franciscan Formation (Late Jurassic)

The Franciscan is composed of metamorphosed Jurassic-age volcanic and sedimentary rocks and makes up the core of the Diablo Range. Locally, the Franciscan Formation is west and east of the proposed dam footprint and outside of the Project Area. Its eastern flank is bound by the Ortigalita fault which separates it structurally from both the Coast Range Ophiolite and the rocks of the Great Valley Sequence.

Panoche Formation (Late Cretaceous)

Interbedded fine-grained marine sandstone and siltstone containing prominent lenses of massive gray concretionary fine- to medium-grained conglomerate, sandstone, siltstone, claystone and interbedded silty sandstone. There are numerous landslides recorded in the Panoche within and near the project area. Figure 5 shows the location of mapped landslides in relation to the project and the geologic units in which these landslides occur.

Moreno Formation (Late Cretaceous)

Very fine-grained sandstone and siltstone, claystone, shale, micaceous sandstone. Shale units contain limestone concretions, thin sandstone interbeds. Locally abundant microfossils. Interbedded claystone and siltstone units commonly contain gypsum. The majority of the landslides that have been identified near the project area are located within units of the Moreno Formation (Figure 5).

Tesla Formation (Paleocene to Eocene)

Very fine-grained sandstone and siltstone, micaceous sandstone. Locally contains thin carbonaceous layers. Contains brackish-water megafauna fossils and marine microfossils ranging from Paleocene to Middle Eocene in age.

Valley Springs Formation (Late Oligocene and Early Miocene)
Clayey sandstone, sandy tuffaceous claystone, and light-gray vitric tuff. Locally shows crude irregular bedding and poorly developed prismatic structure.

Fanglomerate (Early Pliocene? and Late Miocene)
Conglomerate, sandstone, siltstone. Crossbedding and channeling and common in sandstone.

Alluvium of Los Banos (Middle to Late Pleistocene)
Gravel, sand, silt and minor clay in terraces, fans, and pediment gravels.

Alluvium of San Luis Ranch (Early to Late Holocene)
Gravel, sand, silt and minor clay in colluvium.

2. SOILS

The United States Department of Agriculture (USDA) classifies agricultural land according to soil quality and irrigation status. The Farmland Mapping and Monitoring Program updates maps every two years with the use of a computer mapping system, aerial imagery, public review, and field reconnaissance. There are over 700 distinct soil series used to identify unique soils within the state of California (Ferrari et el., 2002). These series are the base units of soil classification and are used in combination with other associated soil series to describe a soil association, which is implemented to map the locations, composition, and properties of soil formations throughout the state. (California Department of Conservation, Farmland Mapping & Monitoring Program: https://www.conservation.ca.gov/dlrp/fmmp).

Based on the University of California Davis Soil Resource Laboratory (SoilWeb: An Online Soil Survey Browser: https://casoilresource.lawr.ucdavis.edu/gmap/), there are 21 soil series (including rock outcrop, gullied land, and unnamed) within the Project Area which have been identified and grouped into 18 numbered USDA soil associations (Figure 6). These associations within our study area can be split broadly into two categories based on slope steepness, defined as follows:

Nearly level to gently sloping (0-8% slope) soils on hills, terraces, alluvial fans, footslopes and basin floors. Overall, these soils associations are well-drained, have low runoff potential, and slow to moderately-slow permeability, and fall into the farmland class of either *Farmland of Statewide Importance*, or *Prime if Irrigated*. The majority of these soil associations are located at and downslope of the proposed main dam.

Steep (8-75% slope) soils on mountain slopes, hills, terraces and backslopes. Overall, these soils associations are well-drained, have medium- to high runoff potential, and moderate- to moderately rapid permeability, and fall into the farmland class of *Not Prime Farmland.* The majority of these soil associations are found upslope of the proposed main dam.

Much of the low-lying area of central and eastern Stanislaus County is worked for agricultural purposes and is important farmland. Our study area is located in the most western portion of Stanislaus County along the margin of the Great Valley and the Coast Ranges. Although much of the project is in an area of significant topographical relief that is impractical for farming, there are locations downstream from the main dam and within the Del Puerto Creek channel itself that are designated as having potential for agricultural use based on their soil classification. It is an important detail that multiple soil associations that may have identical physical and chemical characteristics may be assigned different farmland use designations based solely on differences in slope gradient.

The California Department of Conservation (CDC) recognizes *Prime Farmland* as "…land which has the best combination of physical and chemical characteristics for the production of crops. It has the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops when treated and managed, including water management, according to current farming methods. Prime Farmland must have been used for the production of irrigated crops at some time during the two update cycles prior to the mapping date. It does not include publicly owned lands for which there is an adopted policy preventing agricultural use." (USDA-SCS, 2019) There are no Soil Associations within the Project Area that are categorized as Prime Farmland; however, there are seven Soil Associations in the Project Area that are classed as *Prime Farmland if Irrigated*. All of these Soil Associations are located at and/or downslope from the main dam with the exception of Soil Association #145, *Zacharias Clay Loam, 2-5% Slopes*, which occurs downslope of the main dam and also makes up the bed and bank material within the Del Puerto Creek channel upstream of the main dam. (University of California Davis Soil Resource Laboratory: SoilWeb: An Online Soil Survey Browser: https://casoilresource.lawr.ucdavis.edu/gmap/).

The CDC recognizes *Farmland of Statewide Importance* as "…land other than Prime Farmland which has a good combination of physical and chemical characteristics for the production of crops. It must have been used for the production of irrigated crops at some time during the two update cycles prior to the mapping date. It does not include publicly owned lands for which there is an adopted policy preventing agricultural use (USDA-SCS, 2019)". Soil Association #210, *Cortina Gravelly Sandy Loam, 0-5% Slopes, Rarely Flooded* is the single occurrence of a Farmland of State Importance area within our Project Area and covers an approximately 0.24 km^2 (0.1 mi^2) strip of land within and just north of Del Puerto Creek located between the California Aqueduct and the Delta-Mendota Canal. According to satellite imagery obtained using Google Earth, this area alongside the creek was being farmed as recently as August 31, 2018.

3. MINERALS

Construction and operation of the Del Puerto Creek dam and reservoir would not result in the inundation or other disturbance of active mineral development, nor would high-quality mineral resources be precluded from future development. No mineral resource zones are mapped in the Project Area.

4. SEISMICITY AND GEOLOGIC HAZARDS

This section describes the faults, seismicity, and seismic/geologic hazards for the project area. A summary of the regulatory framework is also provided.

4.1. Faults and Seismicity

4.1.1.Regulatory Framework

The State and Local regulatory requirements listed below are be applicable to the Project.

- *Alquist-Priolo Earthquake Fault Zone Act –* The Alquist-Priolo Earthquake Fault Zone Act (Public Resources Code Sections 2621 et seq.) was passed in 1972 to prevent buildings from being constructed astride active faults. The act is designed to mitigate surface fault rupture by preventing construction of buildings for human occupancy across an active fault. It requires State zoning of active faults, and local review and regulation of development within the defined zones. A-P zones are areas established along and parallel to the traces of active faults. The delineation of A-P zones on topographic maps is the responsibility of California Geological Survey (CGS; formerly the California Department of Conservation, Division of Mines and Geology). The purpose of A-P zones is to prohibit the location of structures for human occupancy on the traces of active faults, thereby mitigating potential damage from fault surface rupture.

- *Seismic Hazards Mapping Act –* The Seismic Hazards Mapping Act and related regulations establish a statewide minimum public safety standard for mitigation of earthquake hazards (CGS, 1994). According to this act, the minimum level of mitigation should reduce the risk of ground failure during an earthquake to a level that does not cause the collapse of buildings for human occupancy, but, in most cases, not to a level of no ground failure at all. Nothing in the act precludes public agencies from enacting more stringent requirements, or from requiring a higher level of performance.

- *Surface Mining and Reclamation Act –* The Surface Mining and Reclamation Act was enacted by the California Legislature to address the need for a continuing supply of mineral resources, and to prevent or minimize the negative impacts of surface mining to public health, property and the environment. The Department of Conservation's Office of Mine Reclamation and the State Mining and Geology Board are jointly charged with ensuring proper administration of the act's requirements. However, the act is administered at the local city and county level through adopted ordinance for land use permits with oversight from the State Mining and Geology Board. The act requires approval of a mining permit by the local land use agency, a reclamation plan for returning the land to a usable condition after mining, and financial assurances to guarantee costs for reclamation. The act's requirements apply to anyone, including government agencies, engaged in surface mining operations in California (including those on federally managed lands) which disturb more than one acre or remove more than 1,000 cubic yards of material.

- *California Building Code -* California Building Code, 2019 Edition (effective including Title 24 California Code of Regulations would be used to develop design criteria for the non-reservoir/dam facilities, such as the conveyance pipeline beyond the outlet works tunnel and pumping station at the Del Mendota Canal. California Building Code requires that (with very limited exceptions) structures for human occupancy be designed and constructed to resist the effects of earthquake motions. The Seismic Design Category for a structure is determined in accordance with either California Building Code Section 1613–Earthquake Loads, or American Society of Civil Engineers Standard No. 7-16, Minimum Design Loads for Buildings and Other Structures. Using the engineering properties and soil-type of soils at the proposed Project, the site is assigned a Site Class ranging from A to F. The Site Class is then combined with Spectral Response (ground acceleration induced by earthquake) information for the location to arrive at a Seismic Design Category ranging from A to D, of which D represents the least favorable conditions.

- *California Department of Water Resources Division of Safety of Dams (DSOD)* – DSOD reviews plans and specifications for the construction of new dams or for the enlargement, alteration, repair, or removal of existing dams. DSOD must grant written approval before construction can proceed on any dam under DSOD jurisdiction. Dams under the jurisdiction of DSOD are defined in the California Water Code (Division 3, Dams and Reservoirs; Part 1, Supervision of Dams and Reservoirs; Chapter 1, Definitions). The DSODs definition of a jurisdiction dam is described below.

  > "Dam" means any artificial barrier, together with appurtenant works, which does or may impound or divert water, and which either (a) is or will be 25 feet or more in height from the natural bed of the stream or watercourse at the downstream toe of the barrier, as determined by the DSOD, or from the lowest elevation of the outside limit of the barrier, as determined by the DSOD, if it is not across a stream channel or watercourse, to the maximum possible water storage elevation or (b) has or will have an impounding capacity of 50 acre-feet or more; and
  >
  > Any such barrier which is or will not be in excess of 6 feet in height, regardless of storage capacity, or which has or will have a storage capacity not in excess of 15 acre-feet, regardless of height, shall not be considered a dam; and

  The proposed dam and reservoir will be subject to State jurisdiction, a construction application, combined with plans, specifications and other requirements will be filed with DSOD. DSOD will approve the application after all dam safety related issues are resolved.

4.1.2. Fault Activity Classification

The California Geological Survey (CGS) categorizes faults in California based on the age of last displacement, as defined below (Jennings and Bryant, 2010):

- Historic faults have ruptured during historic time (approximately the last 200 years) and are associated with either a recorded earthquake with surface rupture, measurable surface displacement along a fault in the absence of notable earthquakes (e.g., aseismic creep), or displaced survey lines.
- Holocene age faults have ruptured within the past 11,000 years, as demonstrated by geomorphic or stratigraphic evidence of displacement of Holocene deposits or geomorphic features.
- Late Quaternary age faults have ruptured within approximately the last 700,000 years, as demonstrated by geologic and geomorphic evidence of displacement of Late Quaternary

deposits or geomorphic features. This category may include younger faults that lack deposits by which to differentiate younger displacements.

- Quaternary age faults show evidence of surface rupture younger than approximately 1.6 million years, revised to 2.58 million years ago (USGS, 2018), including faults that displace undifferentiated Plio-Pleistocene age deposits.
- Pre-Quaternary age faults lack recognized evidence of Quaternary displacement or show evidence of no displacement during Quaternary time. Also included in this category are known faults for which detailed studies have not determined fault activity, and those faults identified only in preliminary mapping (Jennings, 1999).

The classification of “active” is applied to historic and Holocene age faults; “potentially active” is applied to Quaternary and late Quaternary age faults; and “inactive” is applied to pre-Quaternary age faults. These classifications were developed by the CGS and were adopted by the Alquist Priolo Act (1972) to help delineate Special Studies Zones where detailed geologic investigations are required prior to development. These classifications are not meant to imply that inactive fault traces will not rupture, only that they have not been shown to have ruptured for some time and the probability of fault rupture is low.

The CGS classification approach defines only faults that displace the surface as well as near-surface concealed (or buried) faults in its fault activity map based on the above definitions (Jennings and Bryant, 2010). It is important to note that blind faults, faults that may terminate several kilometers below the surface also represent a seismogenic hazard. Blind faults with evidence of having ruptured and deformed surfaces or deposits of a certain age should also be included as active, potentially active, or inactive according to the age of deformation when considering ground-shaking hazard. The Alquist Priolo Special Studies Zones are limited to areas with the potential for surface rupture and do not consider the potential for surface rupture attributed to blind faults.

The California Department of Water Resources, Division of Safety of Dams (DSOD) uses a more stringent criteria on fault activity classification than CGS. DSOD uses the “Fault Activity Guidelines” of Fraser (2001). The Project will use the DSOD fault activity guidelines for the design and permitting of the reservoir facility. The DSOD fault activity criteria are as described below.

- Active fault as having ruptured within the last 35,000 years.
- Conditionally active fault is defined as having ruptured in the Quaternary, but its displacement history during the last 35,000 years is unknown.

Using DSOD criteria, fault inactivity is demonstrated by a confidently located fault trace that is consistently overlain by unbroken geologic materials older than 35,000 years. Faults that have no indication of Quaternary activity are presumed to be inactive, except in regions of sparse Quaternary cover. Some faults that are associated with historical seismicity but do not show geologic evidence of Late Quaternary faulting may also be considered as active or conditionally active seismic sources.

A comparison of the fault activity classification systems between the CGS an DSOD is provided in Table 1. The DSOD fault activity criteria will be used for the classification of fault activity for the reservoir and dam on this Project.

Table 1 Summary of Fault Activity Classification Systems of the California Geological Survey and Division of Safety of Dams

Period	Epoch	Years Before Present	Fault Activity Classification	
			CGS	DSOD
Quaternary	Holocene	0 to 11,700 years	**Active** (Up to 11,700 years)	**Active** (Up to 11,700 years)
	Pleistocene	11,700 to 2.58 million years	**Potentially active** (Up to 2.58 million years)	**Active** **(From 11,700 and up to 35, 000 years**
				Conditionally active (Greater than 35, 000 years up to 2.58 million years)
Pre-Quaternary		(Greater than 2.58 million years)	**Inactive**	**Inactive**

Note: The age of the Quaternary Period has been revised on multiple occasions since 1993. At the time the Quaternary Fault and Fold database was established (USGS, 1993), the Quaternary time period was defined as <1.6 Million Years before Present (Myr) in the 1983 Geologic Time Scale, published in 1983. In 1999, the USGS revised the geologic time scale to 1.8 Myr, and in 2009 the times scale was revised to 2.6 Myr. Most recently, in 2018 it was revised again to 2.58 Myr, see GSA Geologic Time Scale. The contemporary value established in 2018 is used in this document.

4.1.3 Earthquake Magnitude and Intensity

Earthquake magnitude is a quantitative measure of the strength and energy release of an earthquake, as determined by the seismographic or geologic observations. Several magnitude scales have been developed by seismologists. The original was the Richter magnitude, also known as “local magnitude (ML),” which is a function of the wave amplitude recorded by a seismograph. This scale was developed for specific circumstances for earthquakes in Southern California recorded by a specific type of seismograph but was adapted to use elsewhere. With appropriate distance corrections for a given amplitude, the magnitude value is constant regardless of location and provides an effective means of earthquake size comparison.

The most commonly used scale is the moment magnitude (Mw) scale. Moment magnitude is determined from seismic moment, which is a function of physical properties of the fault rupture, specifically the area of fault rupture, the displacement across the fault, and shear strength of the faulted rock. It is a more uniform measure of the strength of an earthquake because it is independent of the distance and site conditions of recording stations.

Earthquake intensity is a qualitative measure of the effects a given earthquake has on environment, including population, buildings/structures, and the ground at a specific location. The common scale for estimating earthquake intensity is the Modified Mercalli intensity scale. The most commonly used configuration spans the range of intensities from “I” (not felt except by very few, favorably situated), to “XII” (total damage, lines of sight disturbed, and objects thrown into the air).

Although an earthquake has only one magnitude, an earthquake will have many intensities. Intensity at a given site is a function of earthquake magnitude, increasing as magnitude increases; distance from the causative fault, decreasing as distance increases; and underlying site geology, generally increasing in areas with weak, unconsolidated materials (CGS, 2002). Table 2 presents the relationship between Richter magnitude (M2-M8+) and maximum expected intensity (I-XII) close to the epicenter.

Table 2 Comparison of Richter Magnitude and Modified Mercalli Intensity

Richter Magnitude	Expected Modified Mercalli Maximum Intensity (at epicenter)		
	Intensity	Shaking	Observations and Effects
2	I – II	None-Weak	Usually detected only by instruments. Felt only by a few persons at rest, especially on upper floors of buildings.
3	III	Weak	Felt indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake.
4	IV – V	Light-Moderate	Felt by most people. Some heavy furniture moved; a few instances of fallen plaster. Slight damage
5	VI – VII	Strong-Very Strong	Felt by all; many frightened and run outdoors; damage minor to moderate, considerable damage in poorly built or badly designed structures
6	VII – VIII	Very Strong to Severe	Damage moderate to major depending on type of structure. Fall of chimneys, columns, and walls.
7	IX – X	Violent	Damage considerable in specially designed structures. Buildings shifter off foundation.
8+	X – XII	Extreme	Total and major damage

Source: Modified from USGS, 2016

4.1.4 Seismic Setting

The Project Area will likely experience strong ground shaking in the future. In nearly every instance, an earthquake resulting strong ground shaking represents the most severe loading condition that a dam will experience within California. Evaluations of the proposed Project will need to focus on determining the presence or absence of surface deformation (e.g., fault rupture or deformations associated with buried tectonic structures) and strong ground shaking from nearby and distant seismic sources. Strong ground shaking can result in damage and instability of the dam embankment, strength loss of the foundation, instability of the natural reservoir rim, and reservoir overtopping the dam caused by a seiche. Additionally, active faults within the foundation of the dam have the potential to cause damaging displacement of the structure (Fraser, 2001). Strong ground shaking and potential surface fault rupture/tectonic deformation associated with the Coast Ranges-Sierran Block (CRSB) boundary zone or nearby faults may impact the Project. (Figure 7). Notable historic earthquakes that have occurred along the western boundary of the Central Valley include the 1892 M~6.5 Vacaville-Winters and 1983 M6.4 Coalinga earthquakes (AECOM, 2016). The region is characterized by a high level of seismicity with the preponderance of events occurring along the San Andreas fault system located west of the Project Area (Figure 8). Figure 8 shows the historic recorded seismicity for earthquakes between M >1.0 up to M6.9; a total of 95,020 events are shown, of which 50 events are M6 or greater with 8 events M7 or greater (ANSS ComCat, 2019). The most recent major earthquake in the Project Area is the 1989 M6.9 Loma Prieto event. The largest earthquake near the Project is believed to be the 1881 M6.1 earthquake. The estimated location of this event is about 10 km (6.2 mi) northwest from Del Puerto Canyon, the location is highly uncertain given its pre-instrumental age and is based on intensity estimates documented in the public record (AECOM, 2016).

4.1.5 Fault Sources Near the Project

Active faulting and tectonics of California are dominated by the transform plate boundary between the Pacific and North American plates. Much of the deformation along this boundary is accommodated by major strike-slip faults associated with the San Andreas fault system, which includes primary faults San Andreas, Hayward, and Calaveras all of which are located to the west of the Project Area. Locally, the Ortigalita fault exhibits strike slip displacement with normal and reverse mechanisms observed based on focal mechanism solutions (O'Connell et al, 2004).

Fault sources in the Project Area are controlled by local sources in the Eastern Diablo Range and distant, major, strike-slip faults associated with the Pacific-North America plate boundary. As described by O'Connell et al (2004), three main types of potentially active faults are documented near the Project Area: strike-slip faults associated with the Ortigalita fault zone; buried, west dipping blind-thrust faults associated with the uplifted eastern margin of the Diablo Range; and east-dipping bedding-plane reverse faults within the Great Valley sequence.

Faulting in the region is complex in that the area it contains faults of several types and the interaction of these geologic structures has resulted in a complex history of late Cenozoic tectonic deformation (O'Connell et al, 2004). Furthermore, interpretation of this history is difficult because of an absence of well-dated late Cenozoic stratigraphic units and the fact that the geometries and activity rates of the concealed blind thrust faults must be inferred from surface observations.

Table 3 lists selected potential fault sources located near the proposed Project Site. This table lists the active fault name, fault type, recency of movement, $\mathbf{M}_{max}$ value, and closest distance from the site and is based on USGS 2008 Update of the United States National Seismic Hazard Maps (Peterson et al, 2008). The values presented in the table below are provided for information of the ground motion levels that the Site Area may experience. A thorough and exhaustive evaluation of seismic sources and ground motion prediction equations, including uncertainties is needed to calculate site-specific ground motions will be completed as part of the engineering design for the Project facilities.

Table 3 Selected Potential Fault Sources Located Near the Proposed Project Site

Fault	Fault Type	Recency of Movement	M_{max} (M_w)	Approximate Closest Distance to the Reservoir Dam Km (Mi)
Great Valley 07/ Orestimba (San Joaquin)	Reverse	Late Quaternary	6.6 to 6.9	0.3 (0.2)
Great Valley 08/Quinto (San Joaquin)	Reverse	Late Quaternary	6.6 to 6.8	7.4 (4.6)
Great Valley 09/Laguna Seca (San Joaquin)	Reverse	Late Quaternary	6.6 to 6.8	46.88 (29.13)
Ortigalita	Strike Slip	Latest Quaternary	6.9 to 7.1	24.7 (15.4)
Greenville Connected	Strike Slip	undifferentiated Quaternary (<1.6 Ma)	6.8 to 7.0	29.5 (18.3)
Calaveras – North + Central + South	Strike Slip	Holocene	6.84 to 7.03	47.0 (29.2)
Calaveras – North + Central	Strike Slip	Holocene	6.8 to 7.0	47.0 (29.2)
San Andreas – North + Peninsula + South	Strike Slip	Holocene	7.8 to 7.9	71.9 (44.7)

4.1.6 Geologic and Seismic Hazards

Geologic and seismic hazards pose a substantial danger to property and human safety. Geologic hazards include landslides and slope failure, subsidence, shrink-swell of soils. Seismic hazards present in

California include ground rupture along faults, strong seismic shaking, liquefaction, ground failure, and slope failure. Man-induced or triggered seismic hazards include Reservoir-Induced Seismicity (RIS).

Landslides and Slope Failure

Landslides and other forms of slope failure form in response to the long-term geologic cycle of uplift, erosion, and disturbance of slopes. Landslides can be composed of soil, rock, or both. Varnes (1978) uses the type of movement (i.e., the displacement mechanism) and the type of material involved in a landslide. The classification of movement may comprise slides, spreads, flows, falls, and topples. These processes are commonly initiated by intense precipitation events in a natural setting. Strong shaking resulting from a nearby earthquake can also trigger landslides and rockfall.

Debris flows and earth flows are other types of landslides that are characterized by soil and rock particles in suspension with water, and which often move with considerable speed. Debris flows often refer to flows that contain coarser soil and rock materials, while earth flows frequently refer to slides that are composed of predominantly finer grained materials.

A significant number of landslides are found within and in the immediate vicinity of the reservoir inundation area, the majority of these landslides are located within units of the Cretaceous Moreno formation, upstream from the proposed main dam. At least seven landslides are mapped within the inundation area of the proposed reservoir – six are in the Moreno formation and one landslide occurs in the Panoche formation (Figure 5). It is expected that additional small landslides and movement of existing landslides would occur as a result of reservoir infilling and operations. These landslides would be expected to experience continuous deformation without some form of stabilization/mitigation. The rate of movement of these landslides would likely be slow. Stability of the reservoir rim, including potential for seismically triggered landslides would be required for design of the Project.

Subsidence

Subsidence is the gradual lowering of the land surface due to compaction of underlying materials. Subsidence can occur as a result of hydrocompaction; groundwater, natural gas, and oil extraction; or the decomposition of highly organic soils. The Project does not include elements such as extraction of subsurface resources that would potentially cause subsidence. Therefore, the hazard of subsidence is not plausible.

Shrink-Swell Potential

Expansion and contraction of expansive soils in response to changes in moisture content can cause differential and cyclical movements that can cause damage and/or distress to shallow founded structures and equipment. Issues with expansive soils typically occur near the ground surface where changes in moisture content typically occur. The potential for shrink-swell conditions are not considered significant and will be considered as part of the design of the proposed Project.

Fault Rupture and Potential for Ground Deformation

Fault rupture is a seismic hazard that affects structures sited above an active fault. The hazard from fault rupture is the movement of the ground surface along a fault during an earthquake. Typically, this movement takes place during the short time of an earthquake, but it also can occur slowly over many years in a process known as creep.

No faults of known Holocene age are mapped within the Study Area. The Orestimba fault, also referred to as the San Joaquin fault which in turn the Orestimba is considered Great Valley 7 (GV07) in the statewide hazard model, is mapped immediately east of the dam area. The timing of the most recent paleoevent is not well constrained. As noted by Bryant (2017), Sowers (1998) Sowers and Ludwig (2000) identified two deformed terraces surfaces and a younger, non-deformed surface. The youngest deformed terrace surface reported by Sowers (1998) and Sowers and Ludwig (2000) is the T5 surface from 29–47 ka. The undeformed T3 surface is 16-32 ka, and the older T 7 surface is 55–83 ka. Holocene displacement of the segment in the Project Area is uncertain. No Alquist-Priolo Act maps have been published for areas within the Study Area.

The Project Site is positioned on the hanging wall that overlies at least one of the west dipping active thrust faults associated with the Great Valley fault zone (e.g., Orestimba fault and possibly Vernalis fault), mapped to the east of the dam site. The potential for permanent surface deformation or surface fault rupture on these structures cannot be precluded.

Detailed geologic studies would be required to assess the presence or absence of faults underlying the site. Any evaluation would need to also evaluate the potential for and range of magnitudes of permanent surface deformation associated with blind fault structures.

Ground Shaking

The severity of ground shaking depends on several variables such as earthquake magnitude, epicenter distance, local geology, thickness, and seismic wave-propagation properties of unconsolidated materials, groundwater conditions, and topographic setting. Ground shaking hazards are most pronounced in areas near faults or with unconsolidated alluvium.
The most common type of damage from ground shaking is structural damage to buildings, which can range from cosmetic cracks to total collapse. The overall level of structural damage from a nearby large earthquake would likely be moderate to heavy, depending on the characteristics of the earthquake, the type of ground, and the condition of the building. Besides damage to buildings, strong ground shaking can cause severe damage from falling objects or broken utility lines. Fire and explosions are also hazards associated with strong ground shaking.

The dam facilities will be permitted and regulated by the DSOD. For engineering analysis, the DSOD requires a deterministic seismic hazard analysis (DSHA) for estimating ground motions for use in the design of the dam. A DSHA calculates estimates of the level of ground shaking due to an earthquake on a specific fault. To select the statistical level of the DSHA results to be used in the design, DSOD uses consequence hazard matrix that considers fault slip rate for the controlling seismic source and consequence classification associated with the dam (Fraser and Howard, 2002). The consequence classification is a function of the dam’s total class weight, which is a function of the dam and reservoir sizes and the hazard associated with the dam. The matrix shows that for extreme consequence dams, the statistical level of ground motion to be used for dam analysis is the 84th percentile level, unless the controlling fault can be assigned to the low slip rate category (i.e., the slip rate is less than 0.1 millimeter per year [mm/yr]). For example, the Orestimba fault (Great Valley 07) fault located east of the Project is considered a moderate slip rate (slip rate of 0.2 – 1.0 mm/yr) fault according to the USGS national seismic hazard model (Peterson, 2014). Using on a moderate slip rate for the Orestimba fault, the statistical level of ground motion required by the DSOD would be either 50th or 84th percentile depending on the determination of consequence level, high or extreme consequence, respectively.

For final design, the DSHA should be conducted incorporating site-specific information for the local seismic sources and site conditions including a comprehensive characterization of uncertainties.

Liquefaction and Lateral Spreading

Liquefaction is a process by which alluvium below the water table temporarily lose strength during an earthquake and behave as a viscous liquid rather than a solid. Liquefaction is restricted to certain geologic and hydrologic environments, primarily recently deposited alluvium (sand and silt) in areas with high groundwater levels. The process of liquefaction involves seismic waves passing through saturated granular layers, distorting the granular structure and causing the particles to collapse. This causes the granular layer to behave temporarily as a viscous liquid rather than a solid, resulting in liquefaction.

Liquefaction can cause the soil beneath a structure to lose strength, which may result in the loss of foundation-bearing capacity and which could cause a structure to settle or tip. Liquefaction can also result in the settlement of large areas due to the densification of the liquefied deposit. Where structures are buried within liquefied deposits, the liquefaction can result in the structure to rise as a result of buoyancy.

Lateral spreading is lateral ground movement, with some vertical component, as a result of liquefaction. In effect, the soil rides on top of the liquefied layer. Lateral spreading can occur on relatively flat sites with slopes of less than 2 percent under certain circumstances, and can cause ground cracking and settlement as a result of ground deformation.

The dam foundation would be founded upon bedrock and is not susceptible to liquefaction. Components of the conveyance system (e.g., pipeline and pump station) would be founded on alluvial deposits, the design of these features will be required to evaluate the potential for liquefaction and develop appropriate mitigation measures, as required.

Seiche and Tsunamis

Seiches are large waves that may form in an enclosed or semi-enclosed body of water that are produced by either wind or seismic activity. A tsunami (also referred to as a tidal wave), is a series of waves in a water body caused by the displacement of a large volume of water, generally in an ocean or a large lake.

The Project Area is not located within a coastal area and the hazard due to tsunamis does not exist. Active faults near the Project Area are not likely to produce significant surface offset underlie the proposed reservoirs. Therefore, the hazard due to seismically triggered tsunamis is negligible. Potential hazards associated with seiche are described below.

Earthquake-induced seiches (wave oscillations in an enclosed or semi-enclosed body of water) can be excited in natural lakes and reservoirs. Development of seiches and their wave height depend strongly on the shape of the reservoir and directivity of energy.

The proposed reservoir would inundate areas underlain by the Cretaceous Moreno and Panoche Formations. Landslides are found within and in the immediate vicinity of the Project Area, the majority of which are located within units of the Moreno formation, upstream from the proposed main dam. Movement of these landslides is expected as a result of infilling and seasonal operations of the reservoir. It is expected that additional landslides would form as well. Movement of existing and any newly developed landslides resulting from reservoir operation is expected, any deformation of the landslide would be relatively slow and at scale that would not form seiche waves of significant magnitude that would overtop the proposed dam.

An assessment of landslide potential and impacts to the Project would be needed for final design of the reservoir and dam.

Reservoir-Induced Seismicity

Reservoir-induced seismicity (RIS), also referred to as "Reservoir-Triggered Seismicity, is a phenomenon in which earthquakes are induced (or triggered) by the initial filling of a reservoir and subsequent seasonal fluctuations in the volume of water over the course of reservoir operation. RIS was first observed and studied following the impoundment of Lake Mead by the Hoover Dam beginning in the late 1930s. In the first decade following the completion of the Hoover Dam and the subsequent filling of Lake Mead, over 6000 earthquakes were recorded within a ten-mile radius of the Project; none had been recorded in the 15 years prior to the creation of Lake Mead. Whether RIS occurs and RIS characteristics are strongly dependent on local geologic properties, including reservoir rock type, fault and fracture characteristics, local and regional tectonics, regional stress orientations, and reservoir operation characteristics, including hydraulic height.

Loading of the crust with a large volume of water creates relatively instantaneous and drastic increase on the normal stress acting on the surface below the reservoir. Additionally, water infiltrating the subsurface increases pore pressure within rock units and faults below, accelerated by the increase of hydraulic head as the reservoir fills. Likewise, as the reservoir is brought to a stable elevation, diffusion of pore pressure may occur in the subsurface material leading to a change in the stresses acting on the material underlying the reservoir. Lastly, subsequent intentional, inadvertent, or naturally occurring changes in reservoir surface elevation will continue to induce these variations in the subsurface. Thus, the potential for RIS must be considered at all phases of operation, from the initial impoundment of the reservoir and over the course of the operation and maintenance of the system (Talwani, 1997).

Considering the seismotectonic setting of the site area, size of the proposed reservoir and dam, height of water combined with the operation of the facility (e.g., seasonal filling followed by drawdown), RIS potential is considered low to moderate and will need to be studied as part of the design and operation of the dam.

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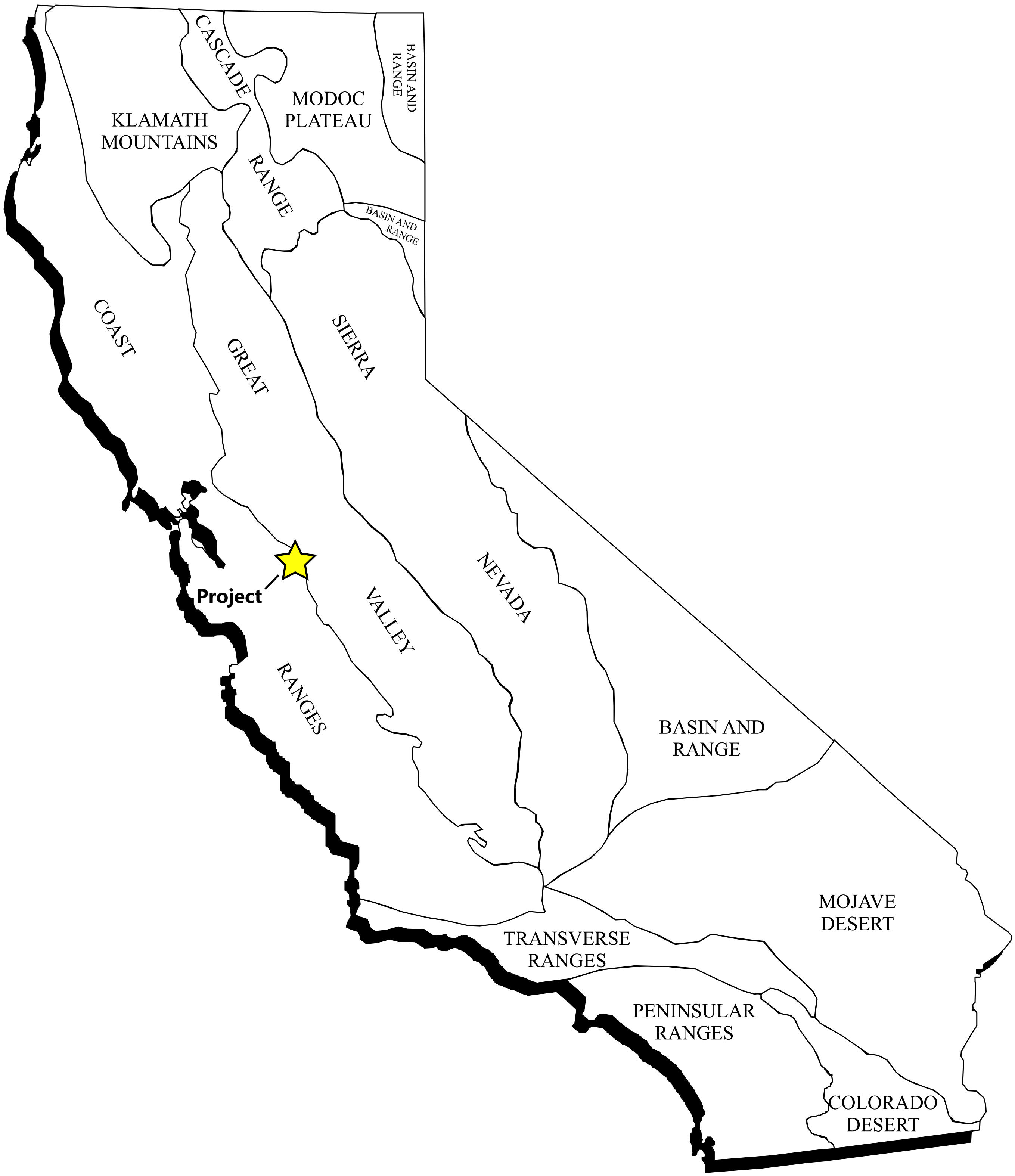
Attachments – Figures 1 through 8



Source: California Geological Survey, 2002

Gannett Fleming	CALIFORNIA GEOMORPHIC PROVINCES MAP Administrative Draft Environmental Impact Report Del Puerto Canyon Reservoir Project Stanislaus County, CA			FIGURE 1
	Date: 2019.07.31	By: J. HOEFT	Scale: AS SHOWN	Project No: 065294

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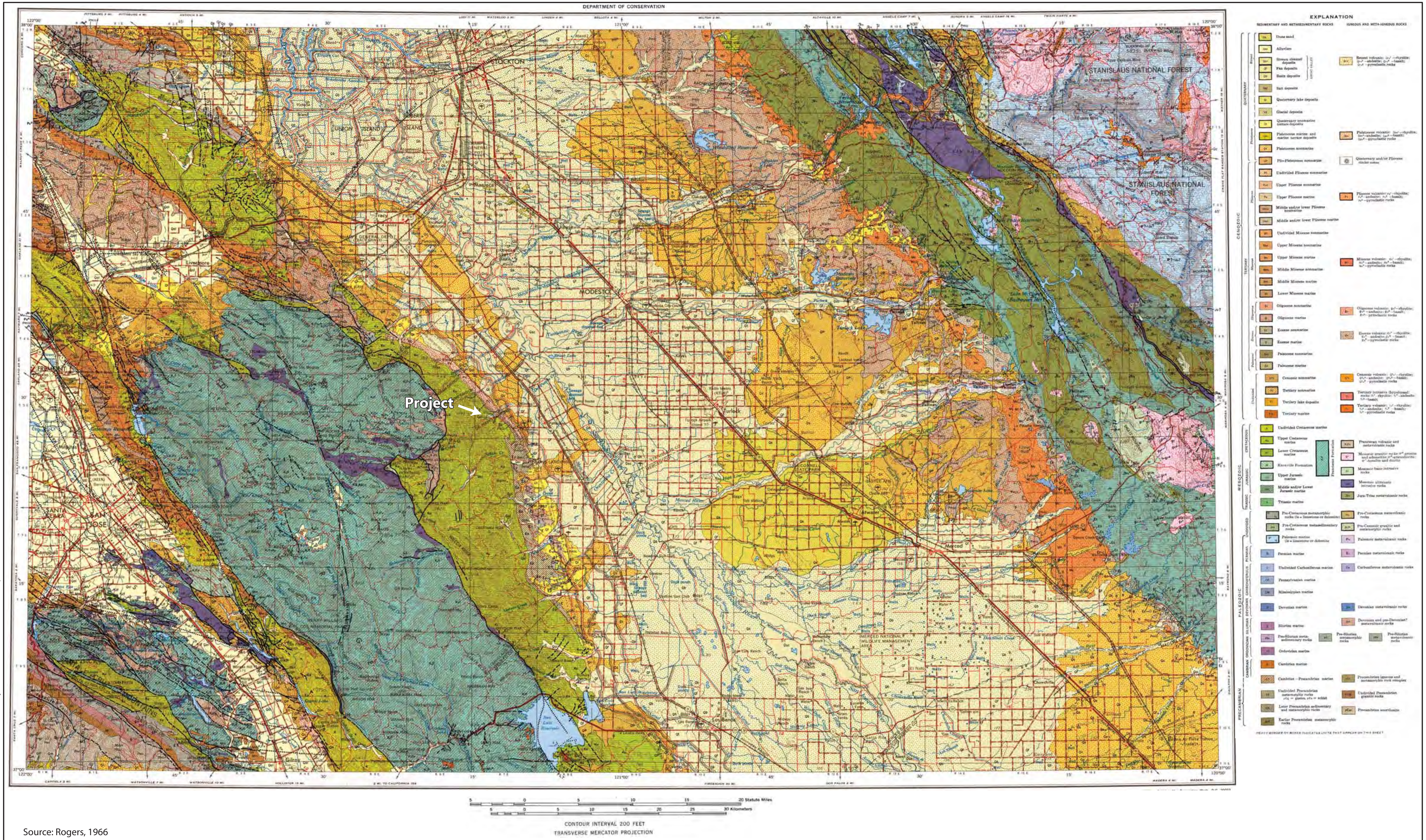

Source: Rogers, 1966

REGIONAL GEOLOGY MAP
Administrative Draft Environmental Impact Report
Del Puerto Canyon Reservoir Project
Stanislaus County, CA

FIGURE 2

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Date: 2019.07.31	By: J. HOEFT	Scale: AS SHOWN	Project No: 065294

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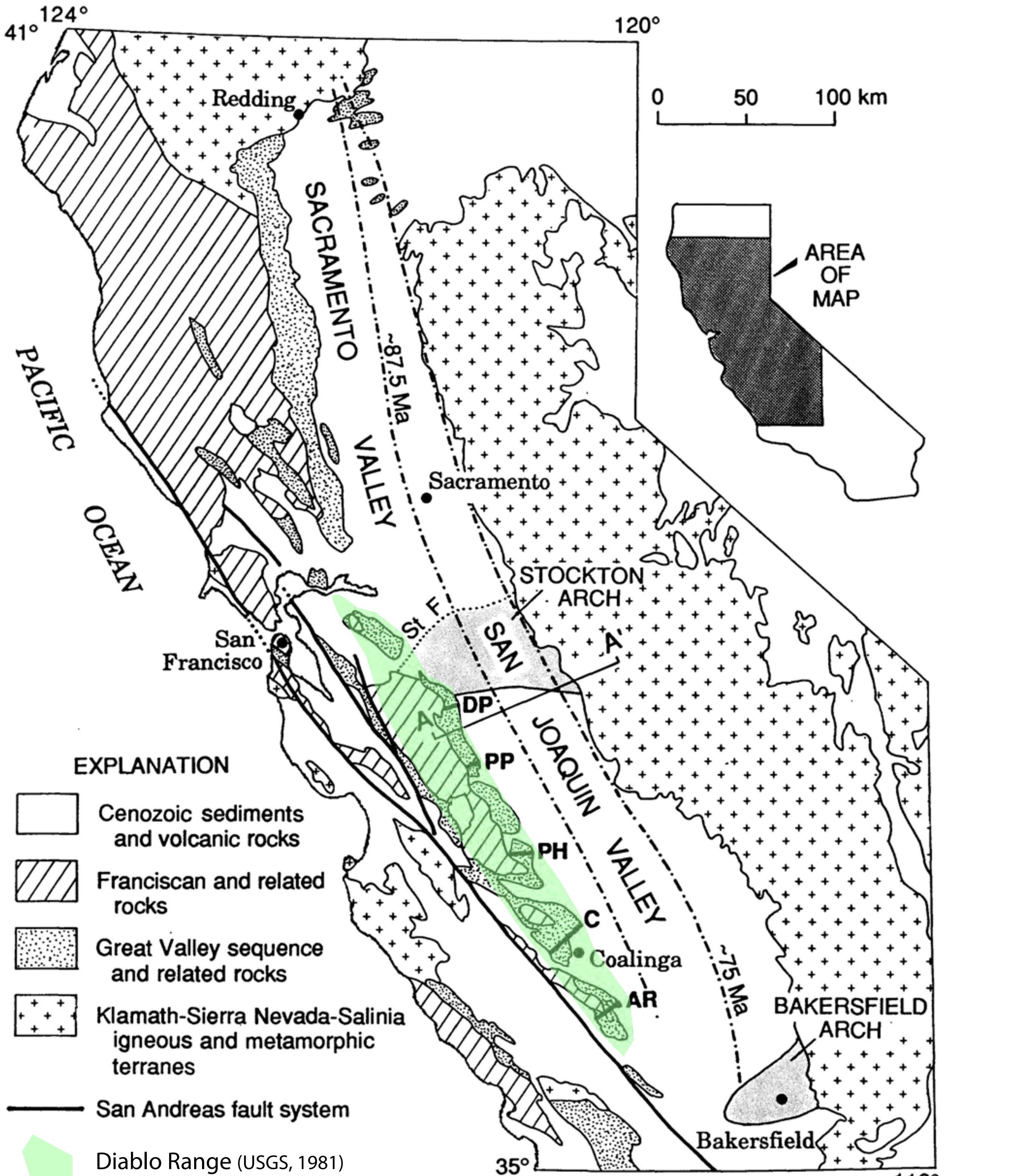

Index map of northern and central California showing principal components of the late Mesozoic arc-trench system and geographic locations. Approximate eastern limit of Great Valley sequence deposition, from Ingersoll (1982). shown for about 75 Ma and 87.5 Ma. Abbreviations: DP, Del Puerto Creek; PP, Pacheco Pass quadrangle; PH, Panoche Hills; C, Coalinga area; AR, Avenal Ridge-Reef Ridge area. Other abbreviations: StF. Stockton fault. Cross-hatching indicates area of Stockton and Bakersfield arches.

Modified from Bartow et al., 1990

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Gannett Fleming	INDEX GEOLOGIC MAP OF NORTHERN AND CENTRAL CALIFORNIA Administrative Draft Environmental Impact Report Del Puerto Canyon Reservoir Project Stanislaus County, CA	FIGURE 3
Date: 2019.07.31	By: J. HOEFT	Scale: AS SHOWN	Project No: 065294

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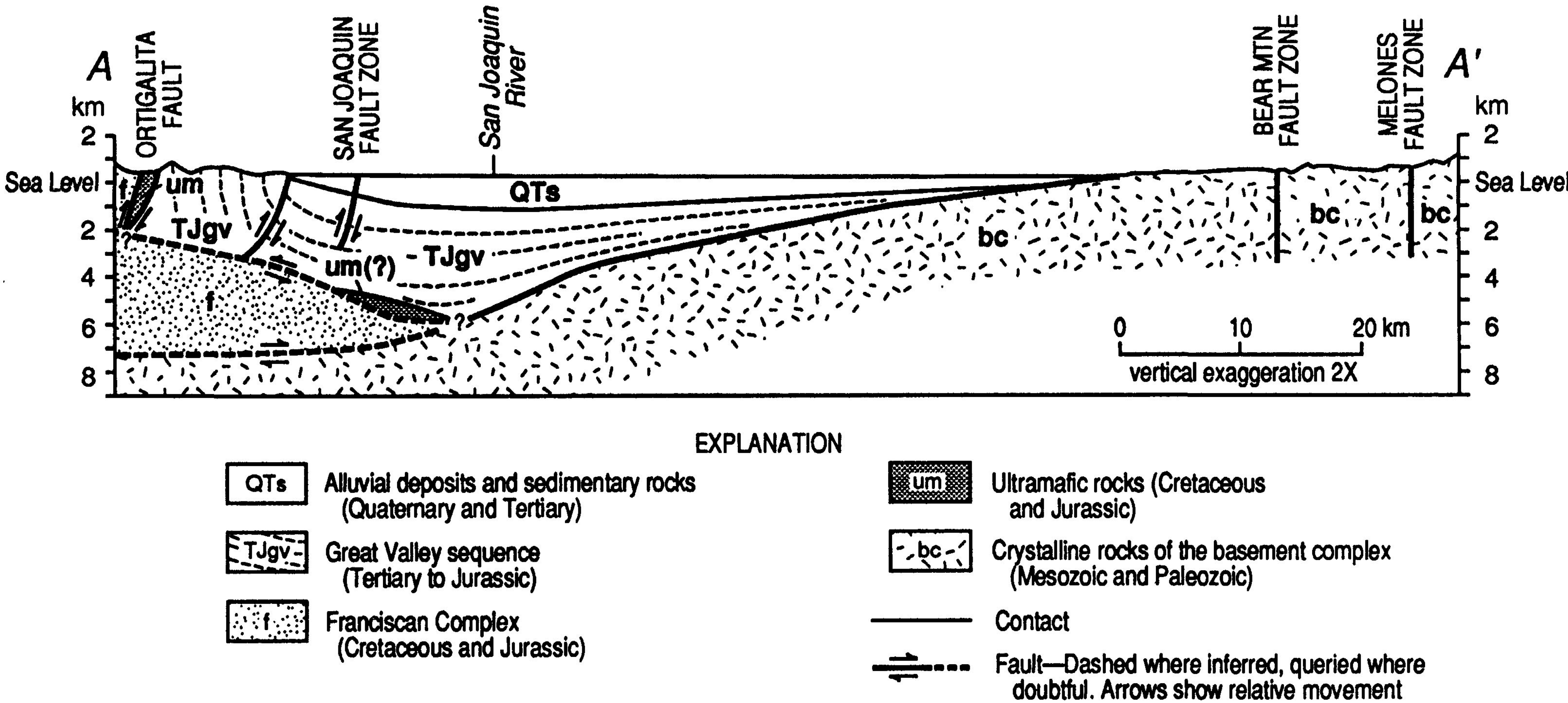


Generalized structure section of the northem San Joaquin Valley. Subsurface wedge of Franciscan rocks based on interpretation of Wentworth and others (1984). Location of section shown on Figure 3.

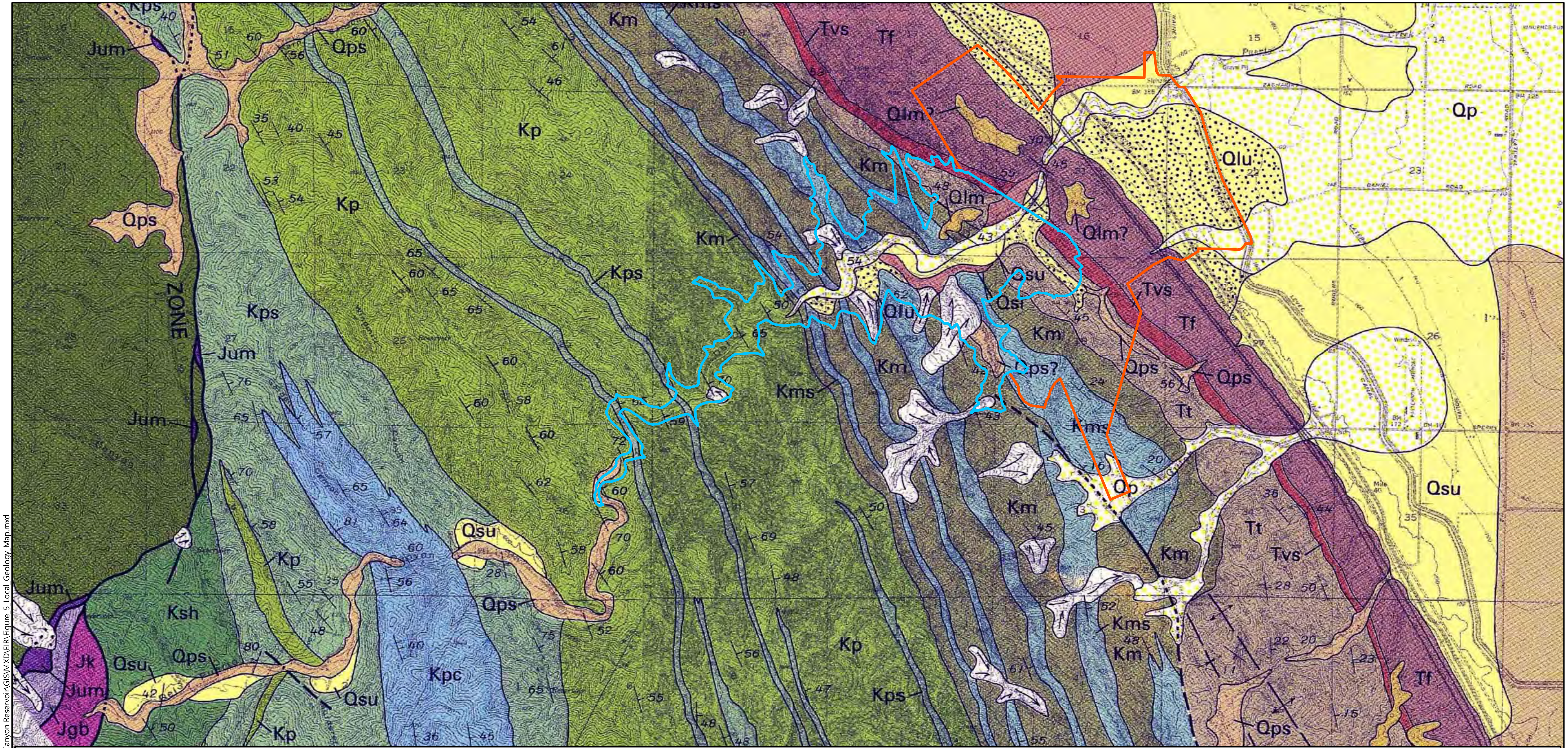
Source: Bartow et al., 1990

Gannett Fleming

STRUCTURAL CROSS SECTION ACCROSS SAN JOAQUIN VALLEY
Administrative Draft Environmental Impact Report
Del Puerto Canyon Reservoir Project
Stanislaus County, CA

FIGURE 4

Date: 2019.07.31	By: J. HOEFT	Scale: AS SHOWN	Project No: 065294



Explanation

Qp	Qp - Alluvium of Patterson (Holocene)
Qsu	Qsu - Alluvium of San Luis Ranch (Upper Pleistocene)
Qsl	Qsl - Alluvium of San Luis Ranch (Lower Holocene)
Qlu	Qlu - Alluvium of Los Banos (Upper Pleistocene)
Qlm	Qlm - Alluvium of Los Banos (Middle Pleistocene)
Tf	Tf - Fanglomerate (Lower Pliocene? and Upper Miocene)
Tvs	Tvs - Valley Springs Formation (Lower Miocene and Upper Oligocene)
Tt	Tt - Tesla Formation (Eocene and Paleocene)
Km	Km - Moreno Formation (Upper Cretaceous)
Kms	Kms - Moreno Formation Sandstone (Upper Cretaceous)
Kp	Kp - Panoche Formation (Upper Cretaceous)
Kps	Kps - Panoche Formation siltstone (Upper Cretaceous)
	Normal Pool Water Surface (El. 450 ft NAVD88)
	Extent of APE's

0 3,000 6,000 12,000 Feet

0 750 1,500 3,000 4,500 Meters

Source: Bartow et al., 1985

Gannett Fleming

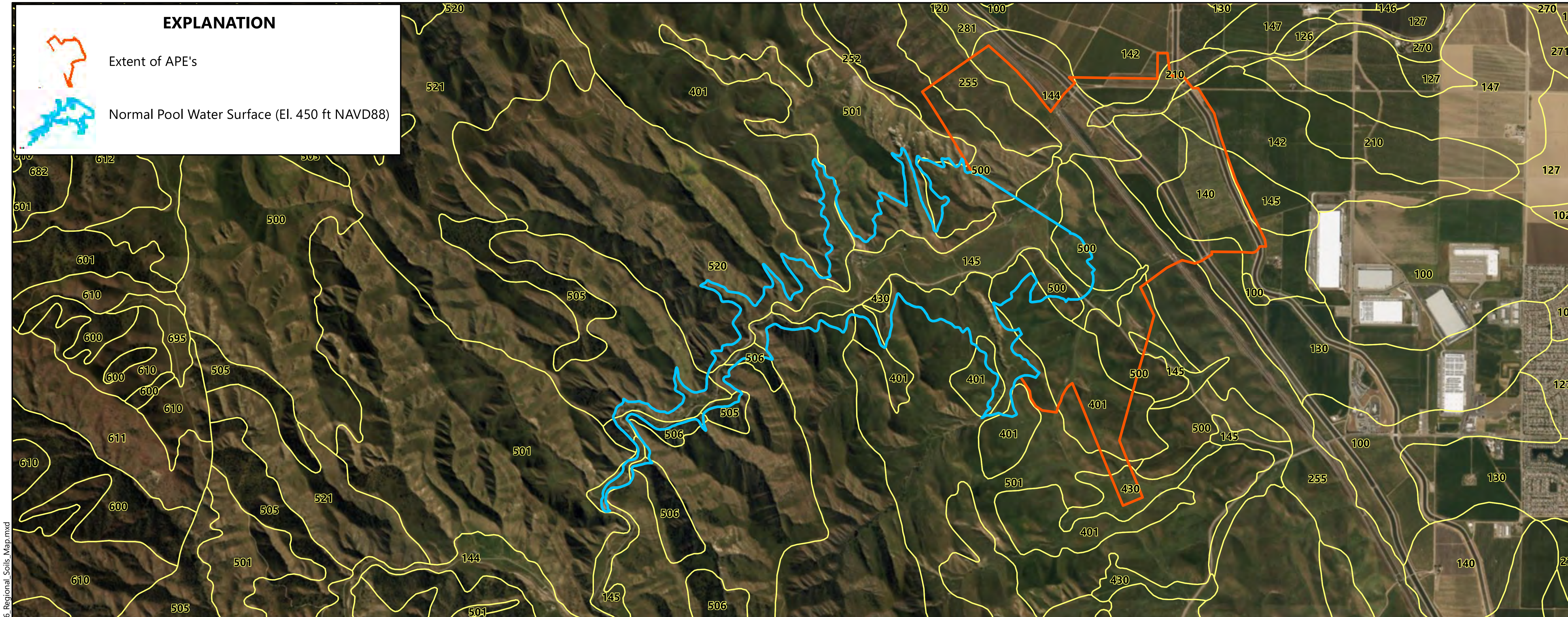
LOCAL GEOLOGY MAP

Administrative Draft Environmental Impact Report
Del Puerto Canyon Reservoir Project
Stanislaus County, CA

FIGURE 5

Date: 2019.08.01 | By: J. HOEFT | Scale: 1:36,000 | Project No: 065294

Document Path: O:\1-projects\2018\118-030.00_Del Puerto WD_Del Puerto Canyon Reservoir\GIS\MXD\EIR\Figure_5_Local_Geology_Map.mxd



SOIL UNITS

SOIL ID #	SOIL ASSOCIATION NAME	SOIL SERIES COMPOSITION (bold ≥ 85% of composition)	TYPICAL LANDFORMS	COMPOSITION	Slope %	Farmland Class	Drainage/Runoff/Permeability
130	Stomar Clay Loam, 0-2% slopes	**Stomar**-Capay-Vernalis-Zacharias	Alluvial fans/footslope/basin floor	clay loam	0-2%	Prime if Irrigated	well-drained/negligible-high/slow
140	Zacharias Clay Loam, 0-2% slopes	**Zacharias**-Capay-Stomar-Vernalis	Alluvial fans/footslope/stream terraces/basin floors	clay loam	0-2%	Prime if Irrigated	well-drained/negligible-medium/moderately slow
142	Zacharias Gravelly Clay Loam, 0-2% slopes	**Zacharias**-Capay-Stomar-Vernalis	Alluvial fans/footslope/stream terraces/basin floors	clay loam	0-2%	Prime if Irrigated	well-drained/negligible-medium/slow
144	Zacharias Gravelly Clay Loam, 2-5% slopes	**Zacharias**-Capay-Stomar-Vernalis	Alluvial fans/footslope/stream terraces/basin floors	clay loam	2-5%	Prime if Irrigated	well-drained/negligible-medium/moderately slow
145	Zacharias Clay Loam, 2-5% slopes	**Zacharias**-Alo-Cortina-Vernalis-Stomar-Vaquero	Alluvial fans/footslope/stream terraces/mountains	clay loam	2-5%	Prime if Irrigated	well-drained/negligible-medium/moderately slow
210	Cortina Gravelly Sandy Loam, 0-5% slopes, rarely flooded	**Cortina**-Xerofluvents-Xerorthents-Stomar-Zacharias	Alluvial fans/footslope	gravelly sandy loam	0-5%	Farmland of State Importance	excessively drained/negligible-low/rapid
252	Chaqua-Arburua Complex, 5-8% slopes	**Chaqua-Arburua**-San Timoteo-Wisflat-Zacharias	Backslope/hills/terraces/alluvial fans/mountains	fine-loamy	5-8%	Not Prime Farmland	well-drained/low-high/moderate
255	Calla-Carbona Complex, 30-50% slopes	**Calla-Carbona**-Arburua-San Timoteo-Wisflat	Terraces/backslope/hills/mountains	fine, loamy alluvium weathered from sandstone	30-50%	Not Prime Farmland	well-drained/low-high/moderately slow
270	Elsalado Fine Sandy Loam, 0-2% slopes, rarely flooded	**Elsalado**-Capay-Zacharias-Vernalis	Alluvial fans/footslope/basin floor	fine sandy loam	0-2%	Prime if Irrigated	well-drained/low/moderate
281	Carbona Clay Loam, 2-8% slope	**Carbona**-Stomar-Calla-Cortina-Vernalis	Alluvial fans/terraces/footslope	clay loam	2-8%	Prime if Irrigated	well-drained/low-very high/slow
401	Alo-Vaquero Complex, 30-50% slopes	**Alo-Vaquero**-Wisflat-Arburua-San Timoteo-Carbona	Montains/hills/backslope/terraces	Silty clay, weathered from sandstone	30-50%	Not Prime Farmland	well-drained/low-very high/slow
430	Vaquero-Carbona Complex, 8-30% slopes, MLRA 15	**Vaquero-Carbona**-Wisflat-Arburua-Gullied Land-San Timoteo	Mountain slopes/backslope/hillslope/terraces	clay loam	8-30%	Not Prime Farmland	well-drained/high-very high/slow
500	Wisflat-Arburua-San Timoteo Complex, 30-50% slopes	**Wisflat-Arburua-San Timoteo**-Ayar-Rock Outcrop	Hills/backslope	fine- to coarse-grained, loamy	30-50%	Not Prime Farmland	well-drained/medium-very high/moderately rapid
501	Wisflat-Arburua-San Timoteo Complex, 50-75% slopes	**Wisflat-Arburua-San Timoteo**-Rock Outcrop-Ayar	Mountains/mountain slope/backslope	fine- to coarse-grained, loamy	50-75%	Not Prime Farmland	well-drained/medium-very high/moderately rapid
505	Arburua-Contra Costa-Wisflat Complex, 30-50% slopes	**Arburua-Contra Costa-Wisflat**-Rock Outcrop-San Timoteo	Montains/hills/backslope	fine and coarse loamy clay	30-50%	Not Prime Farmland	well-drained/low-high/moderate
506	Arburua-Contra Costa-Wisflat Complex, 50-75% slopes	**Arburua-Contra Costa-Wisflat**-San Timoteo-Rock Outcrop	Montains/hills/backslope	fine and coarse loamy clay	50-75%	Not Prime Farmland	well-drained/low-high/moderate
520	Wisflat-Rock Outcrop Complex, 30-50% slopes	**Wisflat-Rock Outcrop**-Arburua-Unnamed-San Timoteo	Mountains/hills/backslope	Sandy loam	30-50%	Not Prime Farmland	well-drained/medium-very high/moderately rapid
521	Wisflat-Rock Outcrop Complex, 50-70% slopes	**Wisflat-Rock Outcrop**-Arburua-San Timoteo-Unnamed	Mountains/hills/backslope	Sandy loam	50-75%	Not Prime Farmland	well-drained/medium-very high/moderately rapid

N

0 3,000 6,000 12,000 Feet

0 750 1,500 3,000 4,500 Meters

Source:U.S. Department of Agriculture, 2017

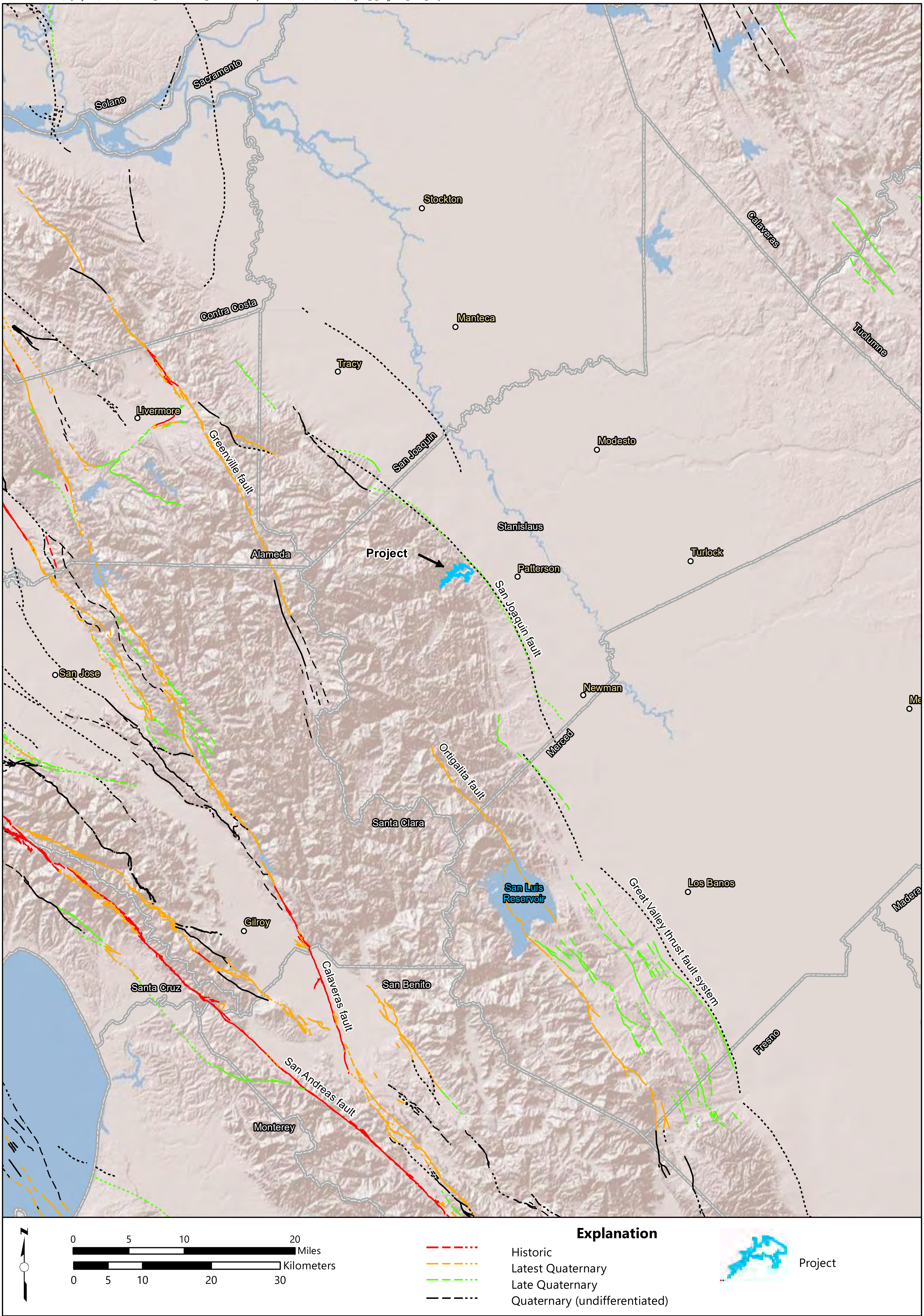
Gannett Fleming

REGIONAL SOIL MAP
Administrative Draft Environmental Impact Report
Del Puerto Canyon Reservoir Project
Stanislaus County, CA

FIGURE 6

Date: 2019.08.01 | By: J. HOEFT | Scale: 1:36,000 | Project No: 065294

Document Path: O:\1-projects\2018\118-030.00_Del Puerto WD_Del Puerto Canyon Reservoir\GIS\MXD\EIR\Figure_6_Regional_Soils_Map.mxd



Fault Source: USGS and CGS, 2018

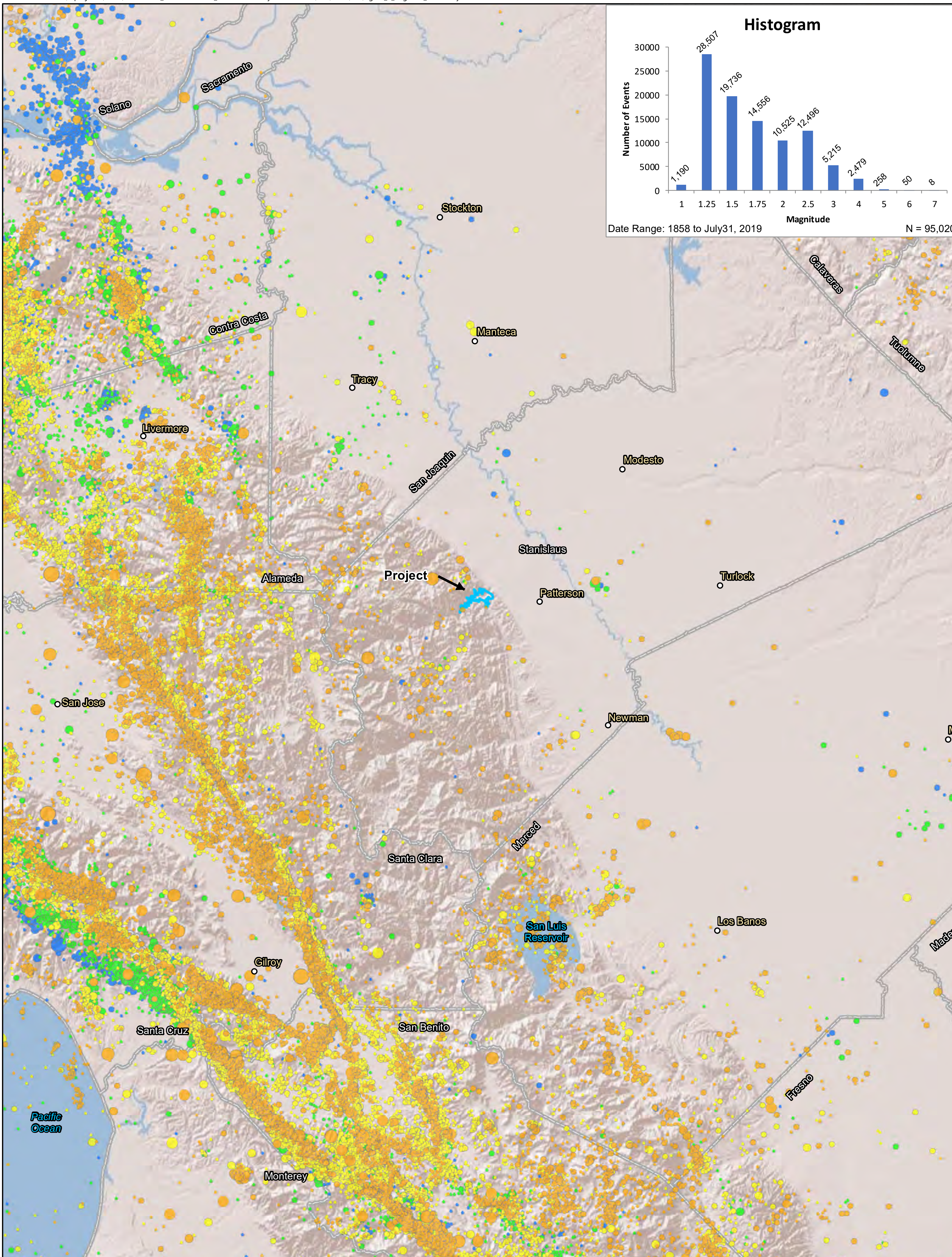
Gannett Fleming

REGIONAL FAULT MAP
Administrative Draft Environmental Impact Report
Del Puerto Canyon Reservoir Project
Stanislaus County, CA

FIGURE 7

Date: 2019.07.31 | By: J. HOEFT | Scale: 1:500,000 | Project No: 065294

Document Path: O:\1-projects\2018\118-030.00_Del Puerto WD_Del Puerto Canyon Reservoir\GIS\MXD\EIR\Figure_8_Regional_Seismicity.mxd



Miles: 0, 5, 10, 20

Kilometers: 0, 5, 10, 20, 30

Explanation

Depth
- 0 to 5 km
- 5 to 10 km
- 10 to 15 km
- > 15 km

Magnitude
- 1.0 - 1.9
- 2.0 - 2.9
- 3.0 - 3.9
- 4.0 - 4.9
- 5.0 - 5.9
- 6.0 - 6.9

Project

Seismicity Source: ANSS, 2019

Gannett Fleming

REGIONAL SEISMICITY MAP
Administrative Draft Environmental Impact Report
Del Puerto Canyon Reservoir Project
Stanislaus County, CA

FIGURE 8

Date: 2019.08.01	By: J. HOEFT	Scale: 1:500,000	Project No: 065294

APPENDIX **F**: **Reservoir Operations and CalSim Data - Revised**

TECHNICAL MEMORANDUM

Del Puerto Canyon Reservoir Operations Analysis

SUBJECT:	Operations Analysis and Results
PREPARED FOR:	Del Puerto Water District and San Joaquin River Exchange Contractors Water Authority
PREPARED BY:	Rachel Gross and Laney Nelson, Woodard & Curran
REVIEWED BY:	Brian Van Lienden and Lyndel Melton, Woodard & Curran
DATE	~~December 9, 2019~~ September 1, 2020
REFERENCE:	0011297.00

The purpose of this Operations Analysis and Results Technical Memorandum (TM) is to describe Woodard & Curran's (W&C) approach for the operations analysis for the proposed Del Puerto Canyon Reservoir (DPCR) as well as the results of this analysis. This analysis included the use of a model to simulate a potential operational scenario for the DPCR, including the use patterns of Del Puerto Water District (DPWD) and San Joaquin River Exchange Contractors Water Authority (Exchange Contractors) (together "Project Partners"), as well as operational assumptions to make water available for potential water transfers and for deliveries to CVPIA Refuges (Refuges).

1. BACKGROUND AND OBJECTIVES

W&C is assisting the Project Partners in conducting an operations analysis for the DPCR, which would be located on Del Puerto Creek in the foothills of the Coast Range mountains west of Patterson, CA. W&C developed a reservoir operations analysis tool to evaluate a potential operational scenario for DPCR. The technical analysis was developed and implemented in the systems modeling software GoldSim using output data from the CalSim 2 model[1] to appropriately simulate a potential operations scenario to:

1. Assess potential benefits and impacts of proposed DPCR operations
2. Identify potential environmental impacts associated with reservoir operations.

2. MODEL STRUCTURE

The operations analysis was conducted using systems modeling software to simulate potential Project Partner operations within the proposed reservoir.

---

[1] ~~2017 State Water Project Delivery Capability Report version of the CalSim 2 model (https://water.ca.gov/Library/Modeling-and-Analysis/Central-Valley-models-and-tools/CalSim-2/DCR2017)~~ Revised No Action Alternative (09/30/2019 version) developed by the U.S. Bureau of Reclamation for the EIS Administrative Draft Analysis for the Re-initiation of Consultation on the long-term operations of the Central Valley Project and State Water Project

2.1 Geographic and Temporal Scope and Resolution

The analysis focuses on inflows and outflows of the DPCR. Thus, the geographic scope of the analysis includes Del Puerto Creek, DPCR, Delta Mendota Canal (DMC) diversion to DPCR and diversions to demands for each agency. Outside the geographic domain but key variables in operations include Project Partner (specifically DPWD) operations within San Luis Reservoir (SLR), Central Valley Project (CVP) allocations, and Shasta Reservoir inflows.

The model simulates operations of the proposed DPCR under a scenario reflecting a “current” condition for Project Partner supplies and demands and CVP, State Water Project (SWP), and Sacramento-San Joaquin Delta operations. Consistent with CalSim 2, the GoldSim model operates on a monthly time step from October 1921 through September 2003. GoldSim model inputs include estimated historical runoff on Del Puerto Creek and CalSim 2 operational results for this period.

2.2 Modeling Software

GoldSim was selected as the modeling software for this analysis due to its functional ease and efficiency of modeling reservoir systems. GoldSim inherently captures mass-balance relationships in a reservoir system and is thus able to answer the prime questions in this analysis.

2.3 Model Features

The model is a simulation model built to meet the objectives stated in Section 1. It uses a time series of reservoir inflows and outflows (or “puts” and “takes”) to solve the mass balance of the reservoir, subject to constraints.

The model computes reservoir inflows, storage, and outflows as well as demand satisfied at every time step (one month). The main model outputs include the inflows, outflows, and storage for each of the Project Partners as well as for the reservoir as a whole.

2.4 Model Limitations

While the GoldSim model is adequate for planning-level simulation and project facility sizing, there are still some limitations to the model. First, the monthly timestep means that all monthly flows are assumed to be distributed evenly over the entire month when in reality flows are likely to vary throughout the month. Second, planning decisions in the model assume that project partners have perfect foresight for annual hydrological conditions. For example, the model assumes that ~~DPWD~~ the Exchange Contractors will know the total Shasta Inflow for the ~~how much to refill their stored supplies in March of each~~ year at the end of March when the model makes ~~based on~~ a ~~determination~~ decision about operational objectives for ~~the ability of available supplies to meet demand~~ that year, whereas~~.~~ ~~I~~in reality, ~~CVP allocations may change in subsequent months as more information is~~ the total Shasta inflow won’t be known until the end of the year. Finally, the Project Partner pools are modeled separately as individual pools, rather than part of a larger reservoir pool. Results for the whole reservoir are obtained by adding results for individual pools together, which is believed to be largely accurate but may have some limitations. For example, if DPWD’s pool is full and water from DPC flows into the pool, that will show up in the model as a “spill”. However, in reality, if there is room in other the Partners’ pool in the reservoir, that inflow from DPC would be stored and used.

2.5 Model Structure

The model includes system elements (objects) for:

- Reservoirs

- o DPCR
  - DPWD Pool
  - Exchange Contractors Pool
  - Water Transfer Pool
  - Refuges Pool
  - ~~SLR~~

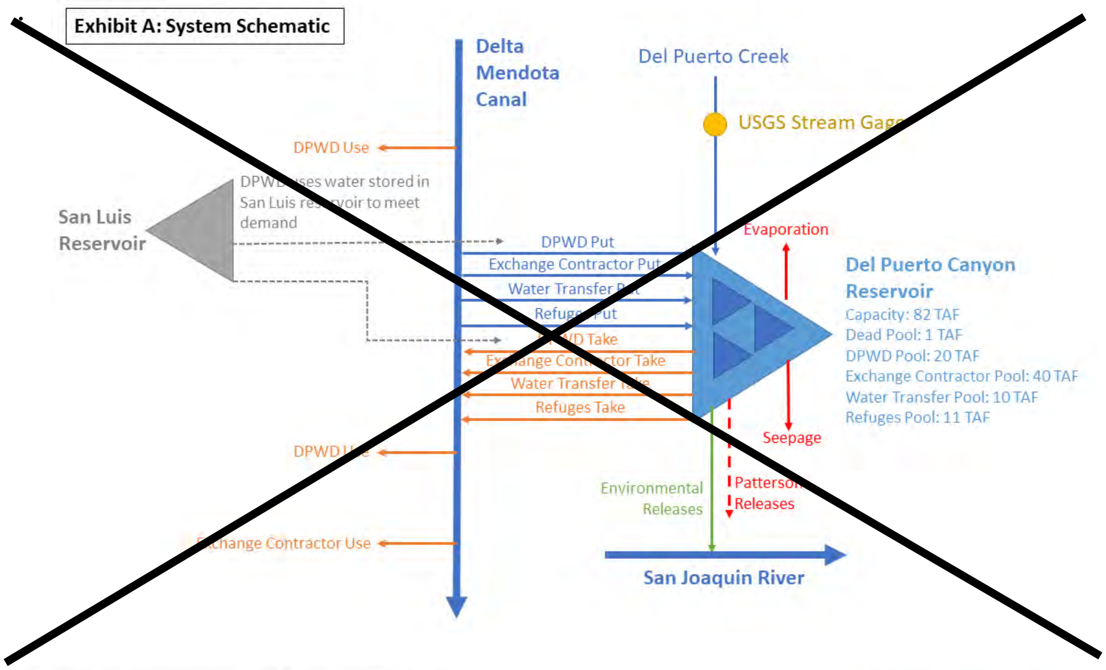
- Inflows
  - o Del Puerto Creek
  - o DPWD Put
  - o Exchange Contractors Put
  - o Water Transfer Put
  - o Refuges Put
  - o Shasta (not into DPCR)
- Outflows
  - o DPWD Take
  - o Exchange Contractors Take
  - o Water Transfer Take
  - o Refuges Take
  - o Environmental Flows
  - o Seepage
  - o Evaporation
  - o Patterson Releases ~~as Mitigation~~

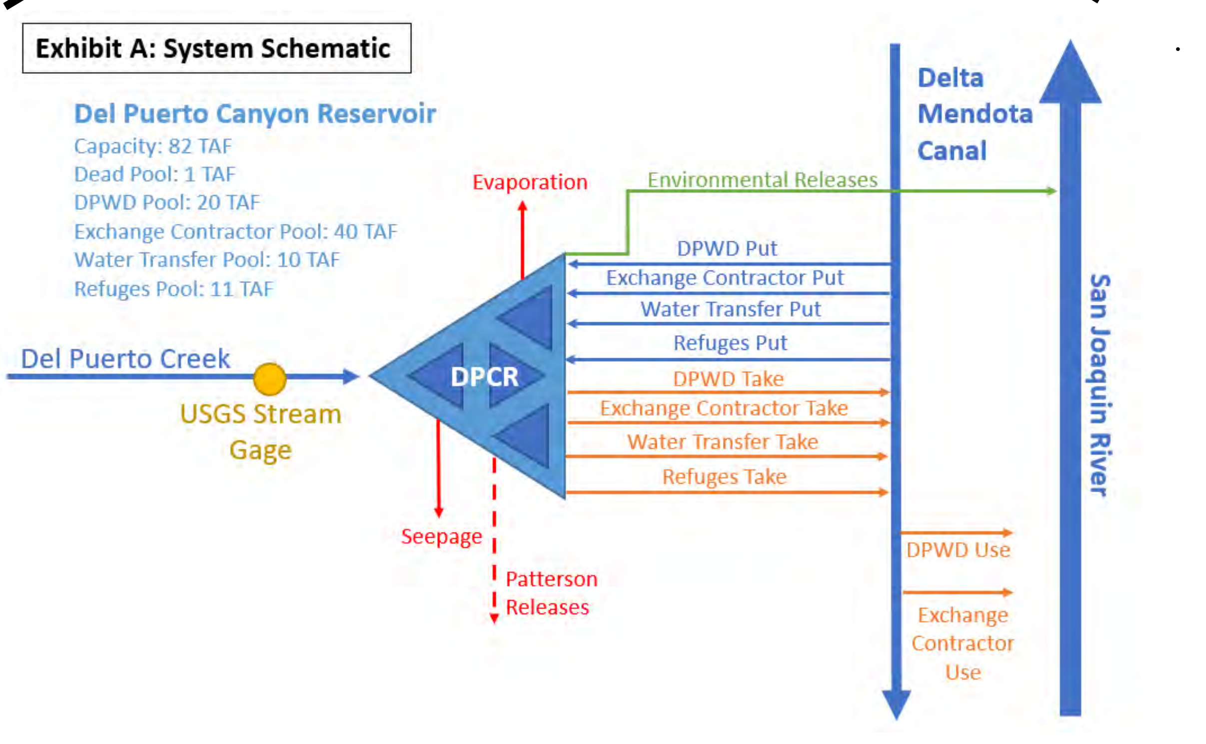
3. DATA INPUTS AND OPERATION RULES

This section describes the assumptions, rules, and data that have been input into the ~~operations~~ model.

3.1 System Overview

Exhibit A (revised) shows a system schematic of the reservoir and flows represented in the ~~operations~~ model.





3.2 Project Partners

For modeling purposes, the DPCR is divided into four operational pools:

- DPWD pool – 20 TAF
- Exchange Contractors pool – 40 TAF
- Water transfer pool – 10 TAF

- CVP Refuges pool – 11 TAF

The operational assumptions for each of these pools are described below.

3.2.1 DPWD

DPWD operates on a water year that runs from March through February.

Pool Size

For the purposes of this analysis, DPWD's portion of the available storage in DPCR is assumed to be **20 TAF**. ~~Additionally, DPWD has access to approximately **14 TAF** of storage in San Luis Reservoir (SLR), which has been included in this analysis to show a more complete picture of DPWD's available supplies and operational patterns.~~

~~**Supplies**~~

~~North Valley Regional Recycled Water Project~~

~~The North Valley Regional Recycled Water Project (NVRRWP) provides recycled water for DPWD. Even though this recycled water cannot be put into the DPCR, it is considered part of the total supply available to DPWD to satisfy its demand. The average annual NVRRWP supply is assumed to be **18,200 AFY**, delivered throughout the year according to the pattern shown in Table.~~

~~**Table 1: NVRRWP Supply**~~

~~Month~~	~~NVRRWP Supply (AF)~~
~~Mar~~	~~2,000~~
~~Apr~~	~~2,200~~
~~May~~	~~2,400~~
~~Jun~~	~~2,400~~
~~Jul~~	~~2,400~~
~~Aug~~	~~2,400~~
~~Sep~~	~~2,200~~
~~Oct~~	~~1,600~~
~~Nov~~	~~600~~
~~Dec~~	~~0~~
~~Jan~~	~~0~~
~~Feb~~	~~0~~
~~**Total**~~	~~**18,200**~~

~~CVP Supply~~

~~DPWD has a CVP agricultural water service contract amount of **140,210 AFY**. However, DPWD typically receives less than this full amount from the CVP due to limited supply availability. For this analysis, DPWD's annual allocation of CVP supply is determined by the total percent allocation for all CVP contractors each year as determined by CalSim 2. Annual allocations range from 0% to 100% with an average of 50%. With the additional storage provided by DPCR, DPWD's use of CVP supplies is likely to shift from historical patterns. For this operational analysis, it is assumed that DPWD can utilize CVP supplies when needed, subject to the Jones export as stored water constraint (see below).~~

~~Demand~~

~~Total DPWD demand is determined by water year type, as defined by the San Joaquin River (SJR) Index. The total DPWD demand is DPWD's target delivery in each year from NVRRWP, CVP deliveries and DPCR releases, and reflects the effects of demand management actions in drier year types. Total DPWD demand by water year type is shown in Table. Monthly demands follow the same pattern as supply.~~

~~Table 2: DPWD Demand by Year Type~~

~~Year Type~~	~~SJR Index~~	~~Demand (AFY)~~
~~Wet~~	~~1~~	~~87,000~~
~~Above Normal~~	~~2~~	~~78,000~~
~~Below Normal~~	~~3~~	~~78,000~~
~~Dry~~	~~4~~	~~64,000~~
~~Critically Dry~~	~~5~~	~~59,000~~

Put Rules

DPWD puts water into ~~its reservoirs (~~DPCR ~~and SLR)~~ at the end of each year (~~Nov~~ <u>Sept</u>ember through February) ~~with excess CVP supply. DPWD refills DPCR first, then SLR. If there is not enough supply to completely refill both reservoirs, DPCR is filled as much as possible, then SJR is filled as much as possible~~.

It is assumed that DPWD would never put water into DPCR during the same month when it is trying to withdraw water from DPCR. Additionally, it is assumed that DPWD does not put supply into DPCR when its pool is full. DPWD may be further constrained by the "Jones export as stored water" constraint, which is a water rights constraint as prescribed by the Bureau of Reclamation (USBR) that constrains the water available to be put into DPCR in each month to the volume of water that has previously been released from one of USBR's upstream reservoirs (Shasta, Folsom, Trinity, or Whiskeytown) and pumped at the Jones Pumping Plant in the same month.

Finally, DPWD's ability to put water into DPCR is constrained by the capacity of DPCR's conveyance infrastructure. This capacity has been optimized between size/cost and minimizing potential impacts on reservoir operations. The capacity for the total "put" into the reservoir is 300 cfs. Under the operations scenario in this analysis, DPWD is assumed to be entitled to use approximately ~~26~~ <u>25</u>% of this capacity, or about ~~77~~ <u>74</u> cfs. If other Partners are not using their allocation of the conveyance capacity, DPWD may use some additional capacity.

Take Rules

DPWD takes water from its reservoirs <u>from March to August of each year. DPWD attempts to fully exercise the reservoir with the goals of developing supply for delivery to DPWD landowners and transfer/exchange partners when supplies exceed District demands.</u> ~~starting in March of each year. DPWD demand is expected to be satisfied first by deliveries from NVRRWP, then by water stored in DPCR, then by water stored in SLR, then by deliveries from CVP. DPWD would leave enough CVP supply so that DPCR can be refilled up to at least 5 TAF from November to February.~~

The amount of water that DPWD can take from DPCR is constrained by the reservoir's conveyance capacity. The conveyance capacity sizing is driven by the amount that can be "put" into the reservoir since the amount that can be taken from the reservoir is generally larger since "takes" rely on gravity while "puts" must be pumped. The capacity for the total "take" from the reservoir is 380 cfs. Under the operations scenario in this analysis it is assumed that DPWD is entitled to use approximately ~~26~~ <u>25</u>%

of this capacity, or about ~~128~~ 94 cfs. If other partners do not utilize their entire allocation of conveyance capacity, DPWD may use some additional capacity.

Another constraint considered for DPWD takes is capacity in the DMC downstream of the reservoir where the water will be conveyed to landowners and transfer partners. The CalSim output for flows in the DMC was used to determine the capacity available in the DMC in each month. The takes for DPWD and each partner are spread out over the months which they would like to take in each year such that they do not exceed the available capacity in the DMC.

3.2.2 Exchange Contractors

Pool Size

For the purposes of this analysis, the Exchange Contractors' portion of the DPCR pool is assumed to be **40 TAF**.

Put Rules

Each year, the Exchange Contractors put as much water that is available to them into DPCR to fill up their 40 TAF pool from October through February. It is assumed that the Exchange Contractors would not put water into DPCR in excess of the capacity available in its pool. Like DPWD, the Exchange Contractors' "puts" are assumed to be constrained by the USBR Jones export as stored water constraint and the DPCR conveyance capacity constraint. See DPWD Put Rules for an explanation of these constraints.

Take Rules

~~Unlike DPWD, Exchange Contractors' operational rules are not structured around supply and demand. Instead, the~~ The Exchange Contractors ~~would~~ attempt to fully exercise the reservoir with the goals of developing transfer supply in most years and local water supply in critically dry years (as defined by the Shasta water year index).

If the current water year's inflow into Shasta Reservoir is greater than 4 MAF, then it is assumed that the Exchange Contractors would take water from DPCR from March through August ~~September~~ and makes it available for transfer to Level 4 refuge supply and other unidentified transfer partners.

If it is a Shasta Critical year, which is defined as a year in which the Shasta Reservoir inflow is less than 3.2 MAF, then it is assumed that the Exchange Contractors would take half of the water it has stored in DPCR to provide local water supply during April and May.

If Shasta Reservoir inflow is between 3.2 and 4 MAF, the Exchange Contractors would ~~not~~ take half of the water ~~from~~ it has stored in DPCR and make it available to unidentified transfer partners.

Like DPWD, the Exchange Contractors' "takes" are constrained by the DPCR conveyance constraint of 380 cfs and the DMC capacity constraint. See DPWD Take Rules for an explanation of this constraint.

3.2.3 Water Transfer

Pool Size

The DPCR will have available storage for an unidentified reservoir partner who will operate the Water Transfer portion of the DPCR. For the purposes of this analysis, the Water Transfer portion of the DPCR pool is assumed to be **10 TAF**.

Put Rules

In every year except San Joaquin River Index critically dry years, the Water Transfer pool will be filled from October to February ~~by taking~~ with as much water as possible, limited only by the Jones ~~USBR Jones~~ export as stored water constraint and the DPCR conveyance capacity constraint. See DPWD Put Rules for an explanation of these constraints. No water is put into the DPCR water transfer pool during San Joaquin River Index critically dry years.

Take Rules

In every year except San Joaquin River Index critically dry years, all available water is taken from the water transfer pool ~~spread evenly~~ taking as much as possible from ~~March~~ April through August, constrained by the DPCR conveyance constraint of 380 cfs and the DMC capacity constraint. See DPWD Take Rules for an explanation of this constraint. No water is taken from the water transfer pool during San Joaquin River Index critically dry years.

3.2.4 CVP Refuges

Pool Size

For the purposes of this analysis, the CVPIA Refuges portion of the DPCR pool is assumed to be **11 TAF**.

Put Rules

The Refuges fill their pool each year from October to February by taking as much water as possible, limited only by the Jones USBR Jones export as stored water constraint and the DPCR conveyance capacity constraint. See DPWD Put Rules for an explanation of these constraints.

Take Rules

The Refuges take all available water in their pool from ~~March~~ April through August, draining ~~it~~ as ~~quickly~~ much as possible within the DPCR conveyance constraint of 380 cfs and the DMC capacity constraint. See DPWD Take Rules for an explanation of this constraint.

3.3 Other Modeling Considerations

3.3.1 Reservoir Topography

The DPCR storage-area-elevation curve was developed using a Digital Terrain Model of Del Puerto Canyon. The Digital Terrain Model is based on NAVD88 and consists of a USGS 1/3 arc second 3D Elevation Program DEM raster, refined with drone-collected terrain elevations. The drone refinement covered approximately 59% of the reservoir extent, and primarily refined the southern wall and mouth of the canyon. The USGS DEM raster has a horizontal resolution of approximately 33 feet and a vertical resolution of approximately 3 feet in the project area. The drone terrain model has a horizontal resolution of less than 1 foot, and a vertical resolution of less than 1 foot. The drone terrain model was calibrated by Landpoint, LLC under contract by Woodard & Curran. The stage-capacity curve was developed in ArcGIS by calculating the fill volume of the reservoir at 10-foot increments. The volume of the dam was then removed from this calculated volume, since the Digital Terrain Model did not include preliminary dam designs. The reservoir's estimated storage-area-elevation curve is shown in Table 1 ~~3~~. Modeling was completed assuming that the reservoir could be filled to 450 ft, but actual capacity may be slightly less due to freeboard requirements. The storage-area-elevation curve and reservoir capacity is expected to evolve as higher resolution topography is completed for the entire inundation area.

Table 1 ~~3~~: Reservoir Storage-Area-Elevation Curve

Elevation (ft)	Storage Capacity (AF)	Surface Area (acres)
200	0	0
210	0	3
220	55	11
230	230	25
240	553	42
250	1,127	73
260	2,001	105
270	3,236	144
280	4,825	177
290	6,750	208
300	8,973	238
310	11,515	270
320	14,347	299
330	17,483	329
340	20,911	358
350	24,646	390
360	28,697	423
370	33,097	459
380	37,845	492
390	42,932	527
400	48,379	564
410	54,211	604
420	60,449	647
430	67,153	695
440	74,331	742
450	81,977	786

3.3.2 Evaporation

Total reservoir evaporation for each month is calculated using the storage-area relationship (Table 1~~3~~), and pan evaporation data (Table 2 ~~4~~), ~~and~~ which is divided by a pan evaporation constant of 1.538. The pan evaporation model input for each month is the monthly average of pan evaporation data from Modesto from 1987 through 2018.

Table 2 ~~4~~: Pan Evaporation Data

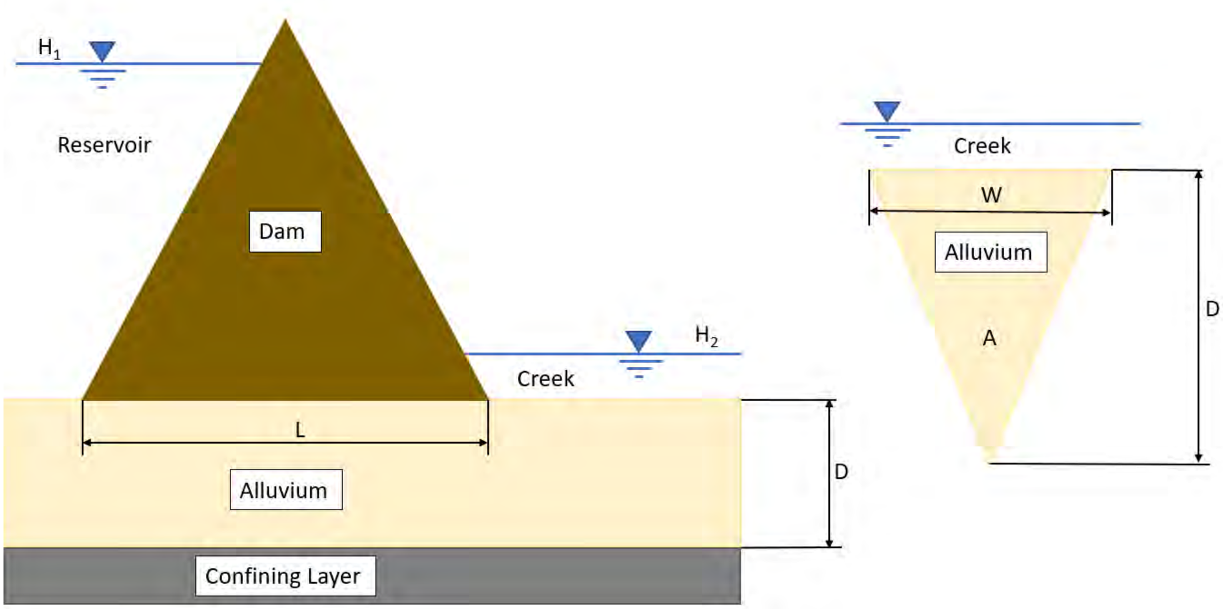
Month	Pan Evaporation (mm/mon)
Jan	28.09
Feb	48.60
Mar	92.66
Apr	131.65
May	175.13
Jun	198.98
Jul	202.32
Aug	175.36
Sept	131.21
Oct	88.11
Nov	44.51
Dec	28.10

After the total reservoir evaporation is calculated for each month, that evaporation loss is allocated to each partner proportionally to each partner's stored water relative to the total water stored in DPCR. For example, if DPWD has 10 TAF stored in DPCR and total reservoir storage is 40 TAF, DPWD will incur 25% (10/40) of the total evaporative loss for that month.

3.3.3 Estimated Reservoir Seepage

Total reservoir seepage for each month is calculated using the storage-area relationship (Table 1 ~~3~~), estimated geometry of the dam and alluvial layer under the creek, and hydraulic conductivity of the alluvial layer (Figure 1).

Figure 1: Reservoir Seepage



Darcy's Law was used to calculate seepage from the reservoir (Q) at any given reservoir elevation (H_1).

Equation 1: Darcy's Law

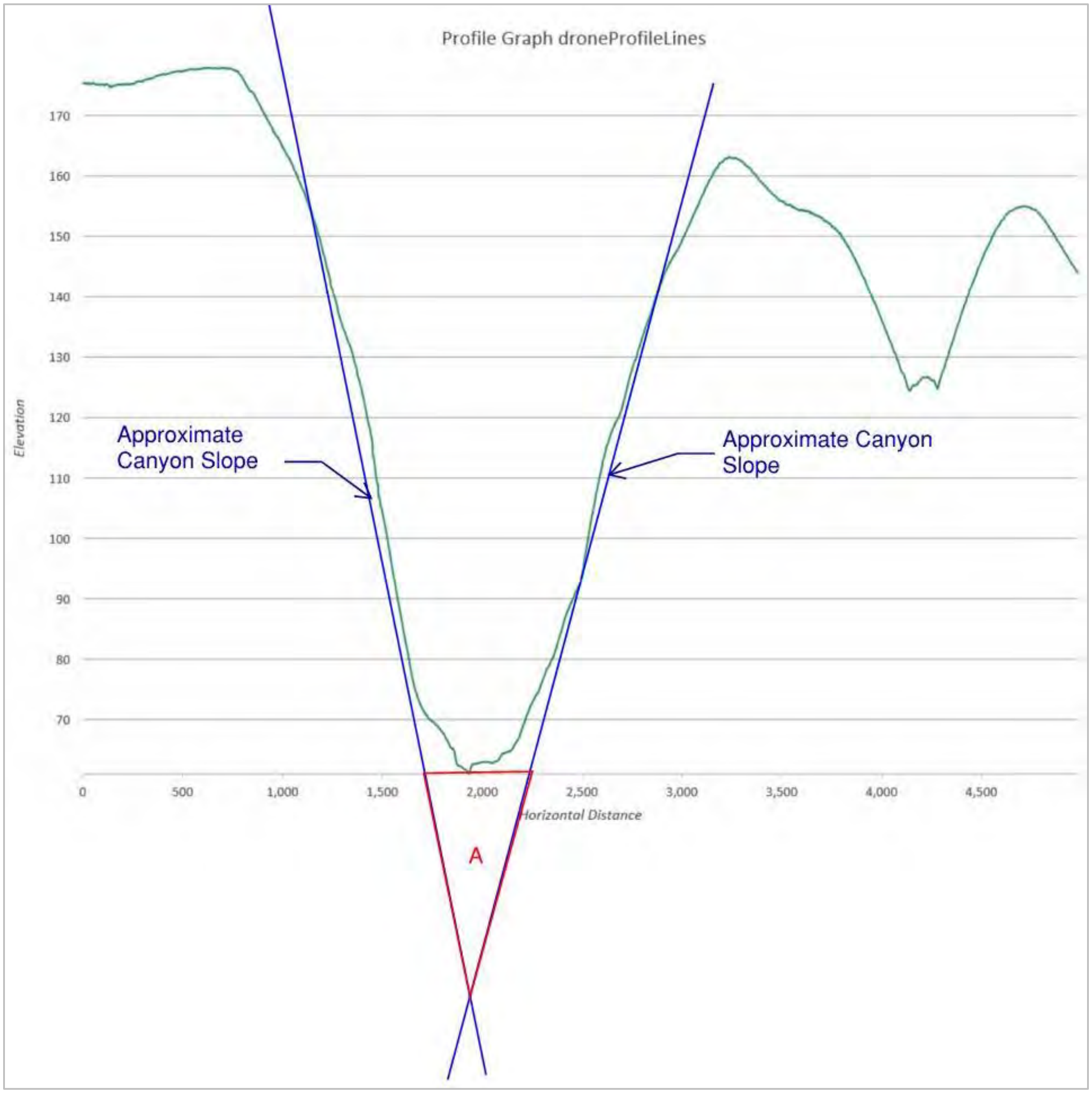
$$Q = \frac{dh}{dx} * A * K$$

Where:

- Q = flow (cf/day)
- dh = $H_1 - H_2$, change in head (ft)
- dx = L, change in distance (ft)
- A = cross sectional area of alluvium (ft^2)
- K = hydraulic conductivity of alluvium (ft/day)

The distance (L) is based on the estimated distance the water would seep from toe to toe under the dam. The cross-sectional area was estimated based on contours of the Del Puerto Canyon developed using the Digital Terrain Model. It was assumed that the slope of the canyon walls at the mouth of Del Puerto Canyon followed the slope of bedrock in the area. Linearly extrapolating this slope below the alluvial floor of the canyon produced a semi-triangular cross section approximately 50 ft tall, and 1,000 feet wide. Figure 2 shows the Digital Terrain Model surface contour, as well as the cross section for underflows under the main dam. The total area of the cross section is approximately 9,400 square feet.

Figure 2: Alluvial Cross Section at Mouth of Canyon



The depth and hydraulic conductivity of the alluvium were determined from the Central Valley Hydrologic Model Version 2[1] (CVHM2). Horizontal hydraulic conductivity (used in the dam underflow calculation) was evaluated at the dam location, using values from the first 4 layers in CVHM2. Specific yield (used in the creek seepage calculation) was evaluated near hydrograph wells in the top layer of the model.

The seepage rate from the reservoir ranges anywhere from 200 AFY for the minimum Deadpool storage of 1 TAF to 1,200 AFY for the maximum reservoir storage capacity of 82 TAF. The actual

[1] Faunt, C.C., Central Valley Hydrologic Model Version 2 Beta. July 2018. US Geological Survey.

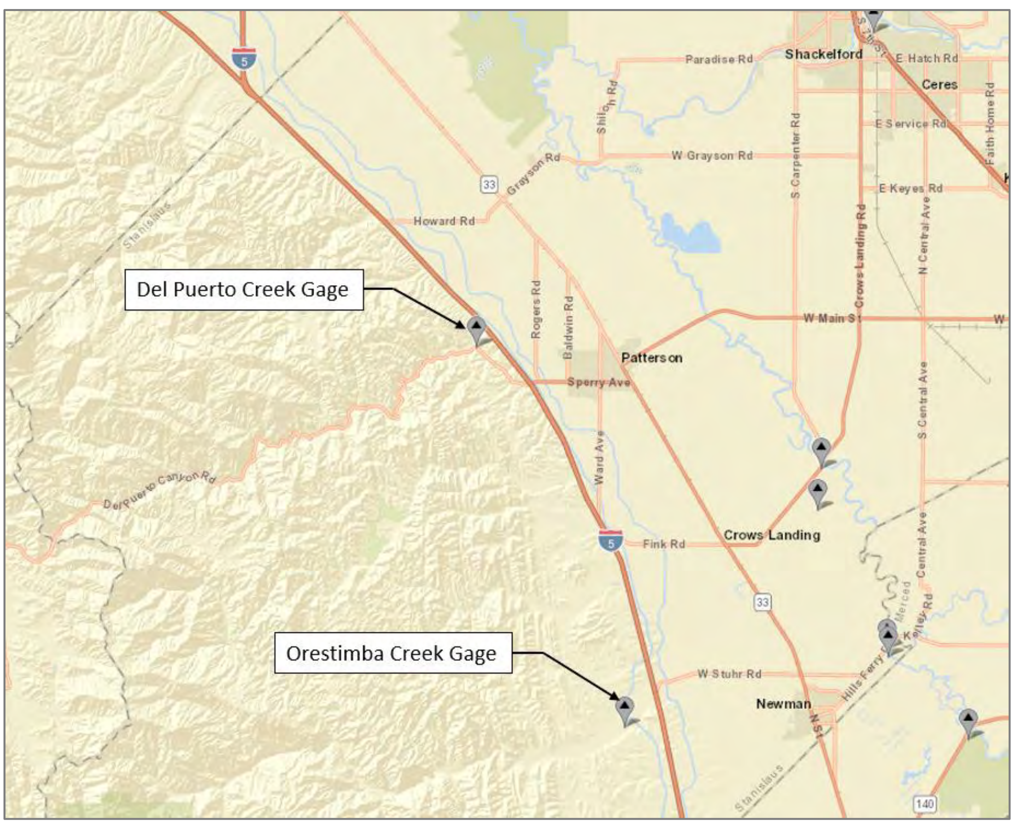
dam design will include a grout curtain to try and mitigate for seepage from the dam. To be conservative, the effects of this were not examined in this analysis.

3.3.4 DPC Inflows

Inflows from Del Puerto Creek (DPC) are modeled using a hydrograph developed from data from the USGS Del Puerto Creek stream gage. The USGS Del Puerto Creek stream gage has recorded streamflow data starting in 1965 and is located near the proposed dam location (Figure 3). The hydrologic record for the model starts in 1921, which leaves a gap of 44 years in the streamflow data. A synthetic hydrograph was developed for these missing years. The USGS stream gage for the Orestimba Creek has record streamflow starting in 1932. Orestimba Creek is located near Del Puerto Creek, approximately 13 miles away (Figure 3). Flow data from Orestimba was compared to DPC flows using regression analysis. The correlation between the two creeks was used to reconstruct DPC flows for the years of 1932-1965. The remaining 11 years of data (1921-1932) were synthesized by using average monthly flows for each water year type as defined by the San Joaquin River (SJR) Index.

Average annual inflow into the reservoir from DPC is approximately ~~6.4 cfs or 4,630~~ 4,550 AFY. The maximum monthly inflow is 340 cfs. The inflow from DPC is split between the project partners proportionally to each partner's storage allocation. For example, if DPWD has a storage allocation of 20 TAF out of the total usable reservoir storage of 81 TAF, it receives 25% of the inflows from DPC. This split in flows occurs consistently regardless of how full the reservoir and each operational pool is. During summer months (June through August), DPC inflows are not impounded into the reservoir due to water right and water availability considerations and are therefore allowed to flow downstream.

Figure 3: USGS Del Puerto Creek Stream Gage



3.3.5 Environmental Releases

Environmental releases are modeled based on specified magnitudes of daily peak flows from DPC to capture the frequency, magnitude, and recession characteristics of the natural hydrograph in a monthly time step. The historical DPC flow daily time series from June 1965 to June 2019 was used in this analysis to analyze peak events and determine an average peak recession rate to mimic the natural hydrograph. An event was considered a peak event if the average daily flow was greater than 500 cfs. This criterion was chosen in order to preserve peak flow events consistent with the “functional flow” approach of managing flows in regulated rivers to mimic the natural patterns of flow variability. These environmental flows are intended to preserve key characteristics of the natural flow regime that drive key geomorphic and ecological processes, including the delivery of gravels that contribute to the maintenance of white sturgeon habitat in the San Joaquin River. Short, periodic high flow releases would mimic the natural intermittent flashy flows on the DPC, which are important for conveying gravels from the creek into the SJR.

Between 1965 and 2019, there were 12 different events with peak flows greater than 500 cfs. These events were analyzed to determine their recession rates over a seven-day period; the first day being the peak flow of that event, and the subsequent flows occurring over the next six days. See the example for the first event that occurred in the series in February of 1980 in Table ~~5~~ below.

Table 3 ~~5~~: February 1980 Flow Recession Analysis

Date	DPC Daily Average Flow (cfs)	Recession Day	Recession Curve as Percent of Peak (%)
2/19/1980	767	1	100%
2/20/1980	304	2	40%
2/21/1980	457	3	60%
2/22/1980	149	4	19%
2/23/1980	110	5	14%
2/24/1980	90	6	12%
2/25/1980	70	7	9%

This analysis was performed for each event and an average recession curve based on the percent of peak was calculated. The final rounded recession curve is shown in Table 4 ~~6~~ below.

Table 4 ~~6~~: Peak Flow Recession Curve

Recession Day	Recession Curve as Percent of Peak (%)
1	100%
2	50%
3	25%
4	12.5%
5	12.5%
6	12.5%
7	12.5%

This curve was applied to each event in the daily time series, up to a maximum daily release of 600 cfs limit based on the hydraulics of the reservoir system. For example, the peak daily flow for an event in March 1995 was 1,230 cfs, and the day 2 recession flow would be calculated as 50% of 1,230, or 615 cfs. In this case, the day 2 recession flow would be 600 cfs due to the system hydraulic limit. This limit was used for flow releases because the flow release is controlled mechanically, and higher flows result in more complicated and expensive systems. The 600 cfs limit is an optimal flow rate to benefit the creek without unnecessarily increasing the complexity and costs of the system. The daily time series with the environmental flow events was then converted to monthly average flows to determine the environmental releases on a monthly pattern. These releases were modeled from 1965-2003 based on historical daily data. A regression analysis was conducted for the modeled monthly environmental releases for 1965-2019 and the actual monthly DPC flows to develop a linear relationship that could be applied to the modeled years before 1965.

Environmental releases average approximately ~~0.74 cfs or 540~~530 AFY. These environmental releases were modeled by reducing the inflow into DPCR by the amount released to simulate the pass-through nature of environmental releases.

3.3.6 Del Puerto Creek Downstream Impacts

The proposed Del Puerto Canyon reservoir will capture flows from the Del Puerto Creek and therefore reduce flow in the creek downstream of the proposed reservoir site. The potential impacts of this flow reduction include:

1. Reduced seepage from the creek into the groundwater basin downstream of the proposed reservoir site.
2. Reduced flow contributed to downstream surface water systems, including the San Joaquin River.

These potential impacts were quantified in the analysis described below.

Methodology for Stream Seepage Estimation – High Flow Events

Creek seepage between the proposed reservoir site and the San Joaquin River was estimated for two creek flow scenarios. The first flow scenario represented existing flows without any reservoir. Del Puerto Creek is a seasonal creek and creek flows are highly dependent on precipitation events. These flows were estimated using observed data from the USGS Del Puerto Creek gage (discussed in Section 3.3.5 of this TM). The second flow scenario represented the flows through the creek under expected reservoir operations. These flows would include releases from the reservoir during large storm events, as well as any environmental or Patterson ~~mitigation~~ releases occurring due to the required operations of the reservoir. These operations are discussed in detail in Section 3.3.5. The difference in seepage between these two scenarios was used to quantify the effect of the reservoir on downstream seepage.

In order to determine the difference in seepage between the two scenarios, the relationship between the creek flows and the change in storage in the aquifer had to be estimated controlling for factors other than seepage. The change in volume of the aquifer can be estimated using the following mass balance:

$$Change\ In\ Storage = Inflow - Outflow$$

Where $Inflow$ is estimated by:

$$Inflow = Creek\ Seepage + Precipitation\ Seepage + Irrigation\ Seepage$$

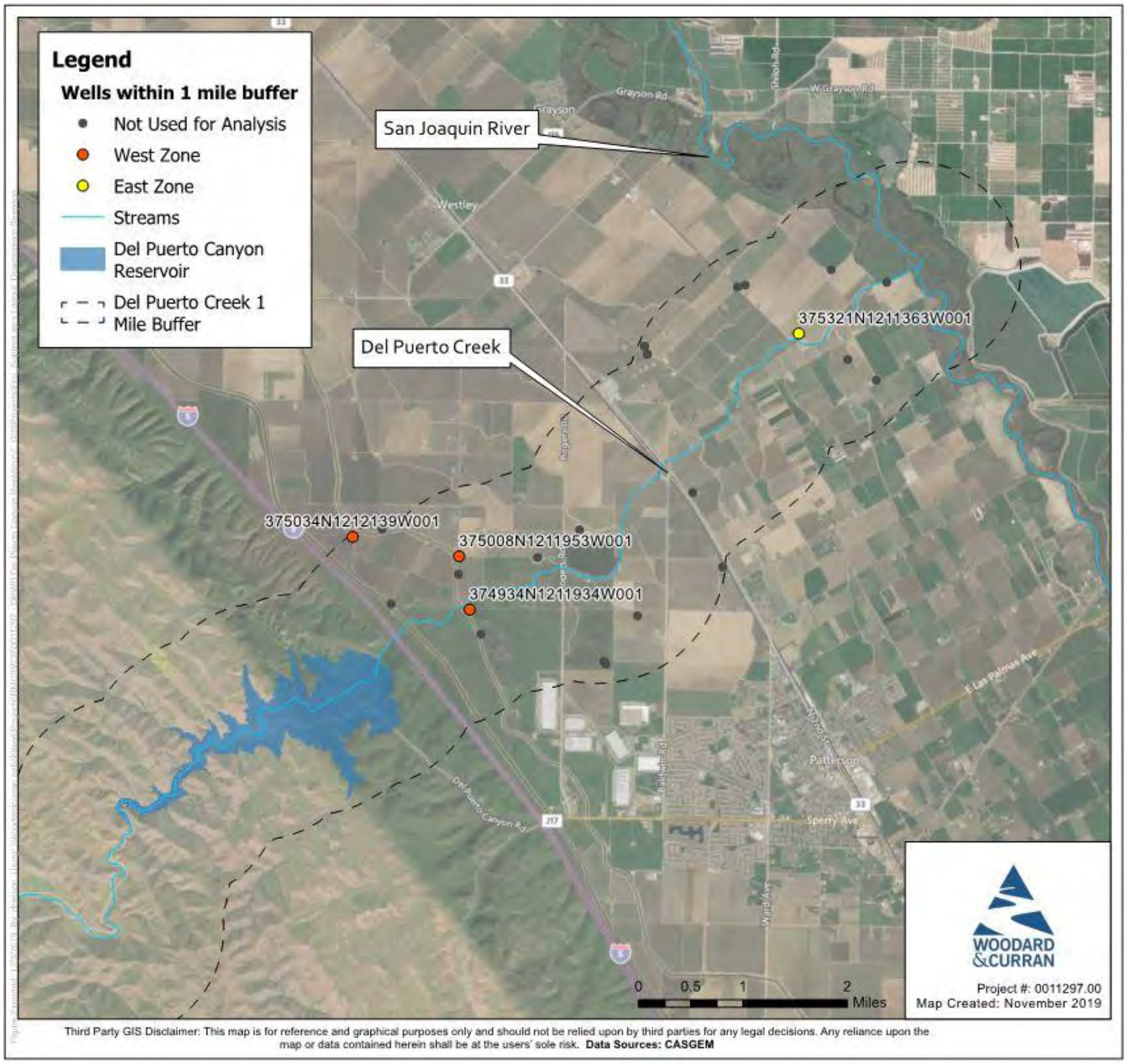
So:

$$Change\ In\ Storage = Creek\ Seepage + Precipitation\ Seepage + Irrigation\ Seepage\ - Outflow$$

A number of assumptions were made to further simplify this mass balance. $Creek\ Seepage$ primarily occurs during larger storm events. During large storm events it can be assumed that $Irrigation\ Seepage$ is negligible. Thus its contribution can be ignored during these time periods. Additionally, since we are looking at the aquifer response over a limited amount of time, the $Outflow$ from the area will be negligible compared to the other volumes.

The $Change\ In\ Storage$ was estimated by evaluating well hydrographs in the area. The hydrographs could be used to determine the rise in water surface elevations. These changes in surface water elevations could be combined with soil porosity data to estimate the volume of water going into aquifer storage. Since the aquifer is unconfined, porosity is well approximated by specific yield. Well hydrographs were collected for wells in a 1-mile buffer around Del Puerto Creek. A total of 28 wells from the CASGEM database were examined in this analysis (Figure 4).

Figure 4: CASGEM Wells Downstream of DPCR



Specific yield values were taken from the MODFLOW based USGS Central Valley Hydrologic Model version 2 (CVHM2) datasets. The specific yield of the soil was determined to be approximately 8.59%. Using this approximation, where the change in water surface elevations is Δh and specific yield is θ, the mass balance becomes:

$$\Delta h * \theta \ = Creek\ Seepage + Precipitation\ Seepage$$

The $Creek\ Seepage$ and $Precipitation\ Seepage$ were assumed to be constant portions of the total volume of creek flow and precipitation respectively. The portion of precipitation was determined using model results from the CVHM2 model and observed precipitation volumes from the Patterson CIMIS station. Modeled volumes of seepage coming from precipitation were compared against the observed volume of precipitation to get the appropriate portion. The percolation data spans from August 1999 to September 2015. A representative storm from 2004 was used to estimate that approximately 34% of precipitation volume percolated into the groundwater basin. If Vol_{precip} is the observed volume of precipitation falling over the 1-mile buffer zone, and α is the portion of precipitation becoming seepage, the following is assumed:

$$Precipitation\ Seepage = \alpha * Vol_{precip}$$

The portion of creek flow the becomes seepage can be found in a similar manner. If β is the portion of creek flows that become seepage, and $Vol_{creek\ flow}$ is the volume of water flowing through the creek, the following is assumed:

$$Creek\ Seepage = \beta * Vol_{creek\ flow}$$

Using these assumptions, the mass balance becomes:

$$\Delta h * \theta = \left(\beta * Vol_{creek\ flow}\right) + \left(\alpha * Vol_{precip}\right)$$

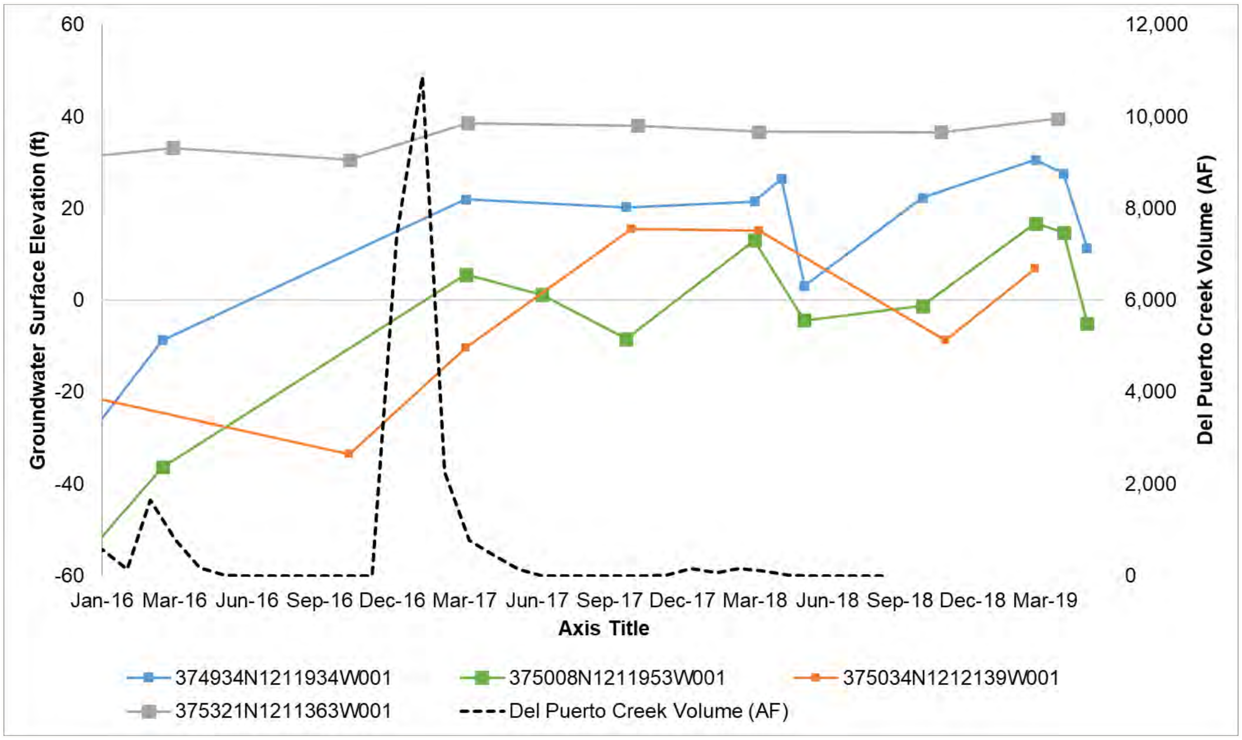
This can be rearranged to solve for the portion of creek flows that become seepage (β):

$$\beta = \frac{(\Delta h * \theta) - \left(\alpha * Vol_{precip}\right)}{Vol_{creek\ flow}}$$

Since observed values for Δh, Vol_{precip}, and $Vol_{creek\ flow}$were available, and estimations from CVHM2 were available for θ and α, the parameter β could be calculated.

Rise in groundwater levels (Δh) was only able to be distinguished for multiple wells for very large streamflow events within a 1-mile buffer of the creek. The largest streamflow event with the most available groundwater surface elevation data from multiple wells occurred in the spring of 2017. There were a total of 28 wells within the 1-mile buffer, of which 4 wells had data for months both before and after the 2017 storm. The groundwater hydrographs and the streamflow during the 2017 event are shown in Figure 5.

Figure 5: Historical Groundwater Surface Elevations for 2017 Storm Event



The change in groundwater surface elevation was multiplied by the area of influence and the specific yield of the soil to determine the change in storage in the groundwater basin during the 2017 storm (Table 5 ~~7~~). The area of influence is based on the zone (east or west) within the 1-mile buffer where the well is located (Figure 4).

Table 5 ~~7~~: Groundwater Volume Change Calculation for 2017 Storm

Well Site Code	Change in Groundwater Surface Elevation (ft)	Volume (Soil+Water) (AF)	Volume Water (AF)
West Zone			
375034N1212139W001	23.0	81,000	7,000
375008N1211953W001	42.0	148,100	12,700
374934N1211934W001	30.7	108,200	9,300
		Average	**9,700**
East Zone			
375321N1211363W001	8	20,200	1,700
	Total Volume Groundwater Change during Storm		**11,400**

The volume of seepage from precipitation was estimated for the 2017 storm using the proportion α. An approximate volume of 2,500 AF of recharge was attributed to precipitation for this storm. Additionally, during the 2017 storm event, the USGS Del Puerto Creek gauge observed 21,900 AF of flow. Using the above volumes, the mass balance above becomes:

$$\beta = \frac{11{,}400\ AF - 2{,}500\ AF}{21{,}900\ AF}$$

$$\beta = 41\%$$

This analysis is also tabulated in Table 6 ~~8~~.

Table 6 ~~8~~: 2017 Storm Characteristics and Calculations

Precipitation Volume	7,200 AF
Estimated % Precipitation Recharged to Groundwater	34%
Groundwater Volume Attributed to Precipitation	2,500 AF
Total Volume Groundwater Change	11,400 AF
Groundwater Volume Attributed to Streamflow	8,900 AF
Streamflow Volume	21,900 AF
Estimated % Streamflow Recharged to Groundwater	**41%**

The estimation of 41% streamflow recharged to the groundwater described above considers a high flow event and is only accurate for high flow events. The relationship between DPC flow and creek seepage for low flow events was estimated for low flow events using a different method described below.

~~Quantification of Reduced Seepage and Flow into the San Joaquin River~~

~~This estimate proportion β was applied to the entire Del Puerto Creek hydrograph for the modeled period of 1921 to 2003 in order to estimate an annual average streamflow seepage downstream of the reservoir of 1,900 AFY under current conditions. With the proposed reservoir, the flow in Del Puerto Creek is decreased. Using this same proportion on these reduced flows, the expected seepage is decreased to approximately 200 AFY (Table 9). Del Puerto Creek flow into the San Joaquin River is calculated as the difference between the Del Puerto Creek flow and Del Puerto Creek seepage, and equals 2,7600 AFY under current conditions and 300 AFY with the proposed project (also shown in Table 9).~~

~~Table 9: Del Puerto Creek Annual Stream Flow and Seepage (AFY)~~

	~~Current~~	~~Proposed Project~~
~~Del Puerto Creek Flow~~	~~4,600500~~	~~500~~
~~Seepage from Del Puerto Creek~~	~~1,900~~	~~200~~
~~Del Puerto Creek Flow into San Joaquin River~~	~~2,700600~~	~~300~~

~~Quantification of Reduced Creek Flows to the San Joaquin River~~

~~As discussed above, the reduction in streamflow downstream of the reservoir before the San Joaquin River confluence will reduce the contribution of flow to the San Joaquin River from about 2,7600 AFY to about 300 AFY. Since the average annual flow in the San Joaquin River is about 3,137,000 AF under current conditions (based on CALSIM output), the total Del Puerto Creek contribution to San Joaquin River flow represents about 0.09% of total San Joaquin River flow under current conditions and about 0.01% of total San Joaquin River flow with the proposed project (see Table 10).~~

~~Table 10: Del Puerto Creek and San Joaquin River Average Annual Flow (AFY)~~

	~~Current~~	~~Proposed Project~~
~~Del Puerto Creek Flow into San Joaquin River~~	~~2,700600~~	~~300~~

~~San Joaquin River (SJR) Flow[1]~~	~~3,137,000~~	~~3,135,000~~
~~Percentage of Del Puerto Creek flow into SJR~~	~~0.09~~08~~%~~	~~0.01%~~

~~1. CalSim modeling results for San Joaquin River at Vernalis.~~

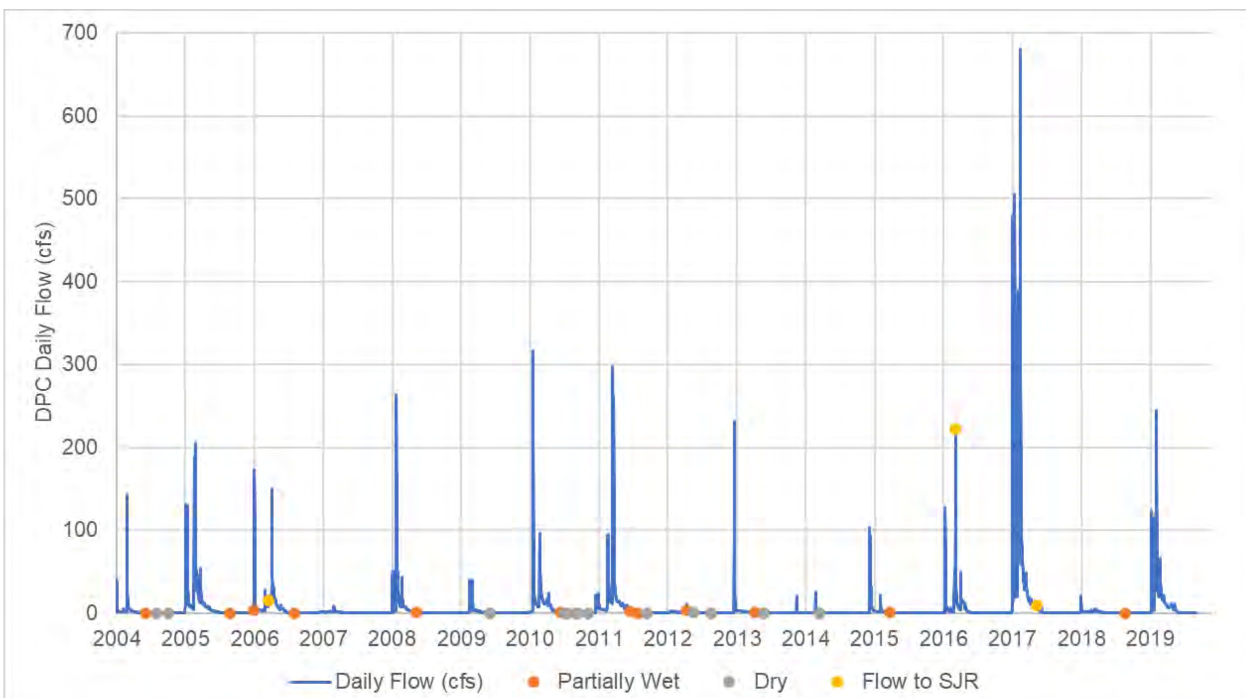
Methodology for Stream Seepage Estimation – Low Flow Events

The relationship between DPC flow and creek seepage for low flow events was estimated using imagery from Google Earth to determine the distance downstream of the dam site at which water is observed in the creek before it infiltrates into the ground.

There are 28 days with unique imagery from 2004 to 2018 on Google Earth. On each of these days, the creek was observed from the dam site at the mouth of the canyon to a confluence point with an irrigation canal at Rodgers Road (shown in Figure 6). Due to agricultural runoff into the creek, flow was observed in DPC in all Google Earth images downstream of Rodgers Road. Therefore, only if continuous flow was observed from the DPC gage location to Rodgers Road (approximately 2 miles from the gage) it was assumed that natural creek flow reached the SJR. Figure 7 shows the DPC daily flow compared with each of these observation days, distinguishing between days where the creek was dry, partially wet, or was assumed to flow to the SJR.

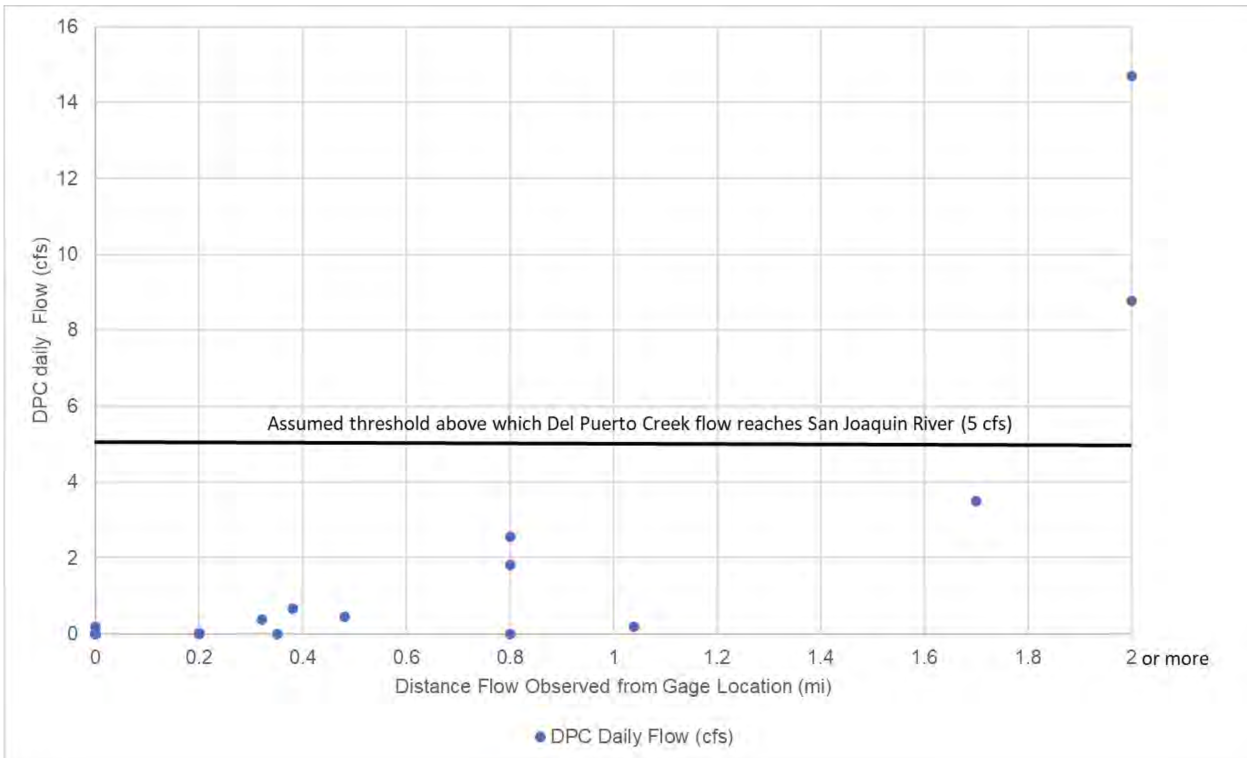
Figure 6: Observed Google Earth Imagery (Imagery Date: August 31, 2018)

Figure 7: Observed Del Puerto Creek Flow from Google Earth Imagery



The distance from the DPC stream gage location to where the creek ran dry was measured on each day. The distance of observed creek flow for all dry and partially wet observations was compared to the daily flow at the stream gage, located west of I-5 near the proposed dam site, to understand the relationship between daily DPC flows and stream seepage and determine a threshold flow below which any flow will fully seep and not reach the SJR (Figure 8). There were 12 days with non-zero flow on the DPC where a Google image was available, all of which had daily flows either less than 4 cfs or greater than 8 cfs. Among these observations, all days with flows greater than 8 cfs had water visual in the DPC for at least 2 miles (and therefore it is assumed that water reached the San Joaquin River), while none of the days with flows less than 4 cfs had flow visual in the DPC for 2 miles. Therefore, the available data indicates that the threshold in daily DPC flow below which all water results in seepage is between 4 and 8 cfs, and a threshold of 5 cfs was selected as a the most reasonable estimate to use for the analysis.

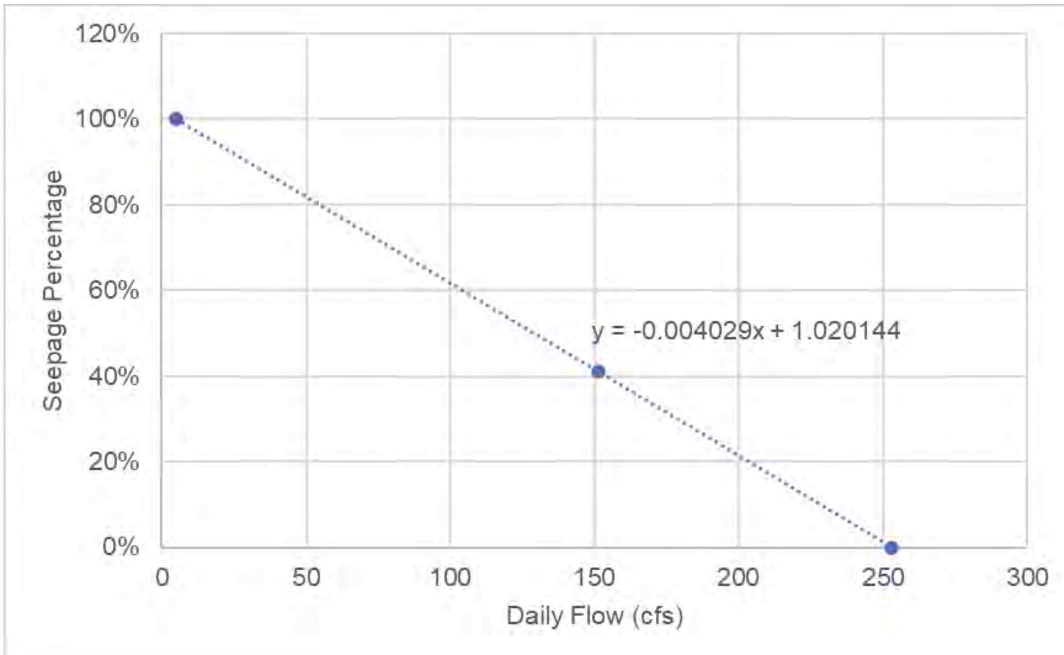
Figure 8: Relationship Between Distance and Del Puerto Creek Flow



Relationship of Del Puerto Creek Flow to Flow Reaching the San Joaquin River

To compare with modeled results that are on a monthly time step, the 5 cfs daily threshold for full (100%) seepage was converted to a monthly time step. Stream seepage as a percentage of creek flow was previously calculated as approximately 41 percent for high flow events. This calculation was based on the 2017 storm, which had an average daily flow of approximately 151 cfs over the course of the storm event. These two data points were extrapolated linearly to estimate the average daily flow corresponding to 0% (i.e., negligible) seepage, or all flowing to the SJR, which was 253 cfs (Figure 9).

Figure 9: Relationship Between Daily DPC Flow and Seepage Percentage



This relationship was applied to the entire historical DPC daily flow time series to estimate daily seepage and flow to SJR, which were then summarized into monthly average values. The monthly cutoff point associated with 5 cfs daily cutoff found previously was determined based on the relationship of calculated monthly flow to the SJR and DPC monthly flow. Based on a review of the available data. a monthly flow of 12 cfs was assumed to be the point where DPC monthly flow is fully seeping and therefore flow to the SJR is 0 cfs (Figure 10). It was therefore assumed that monthly DPC flows of 12 cfs or less will fully seep into the groundwater and none will reach the SJR. A linear curve (Figure 11) was then applied to the historical DPC flows and the modeled DPCR releases to estimate the proportion of DPC flow that results in seepage and the proportion that flows to the SJR in each month for “No Project” and “With Project” scenarios in Section 3.4.

Figure 10: Threshold of Full Seepage from DPC

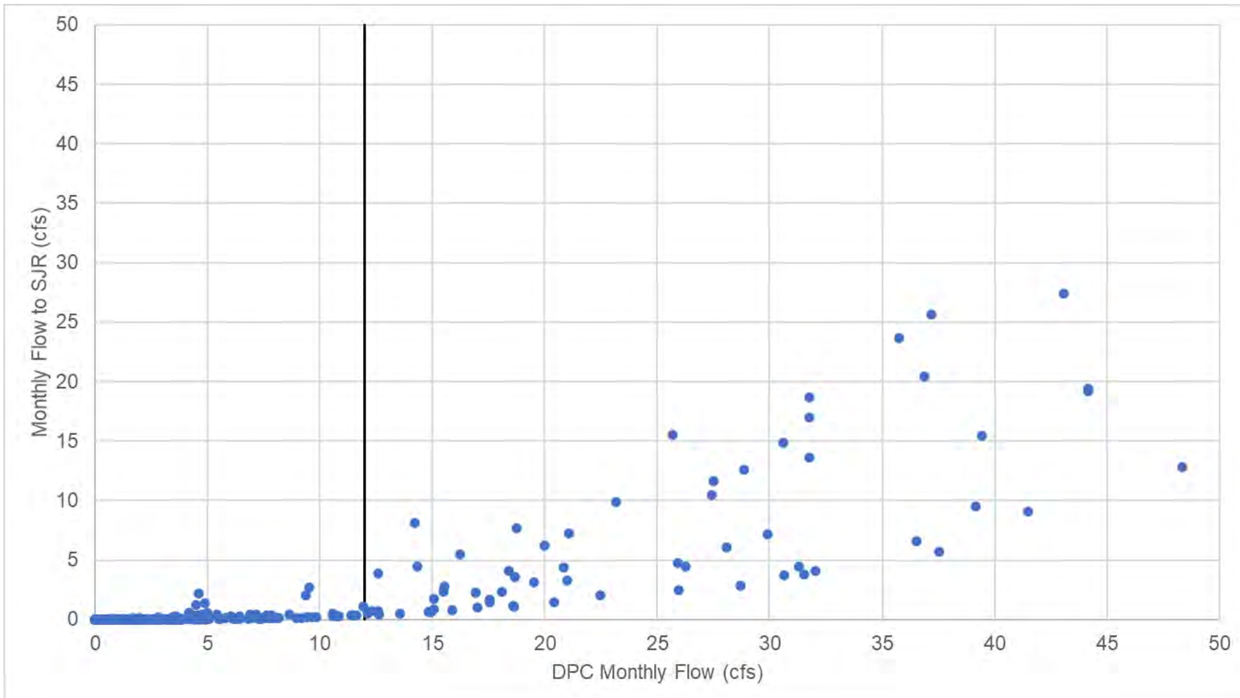
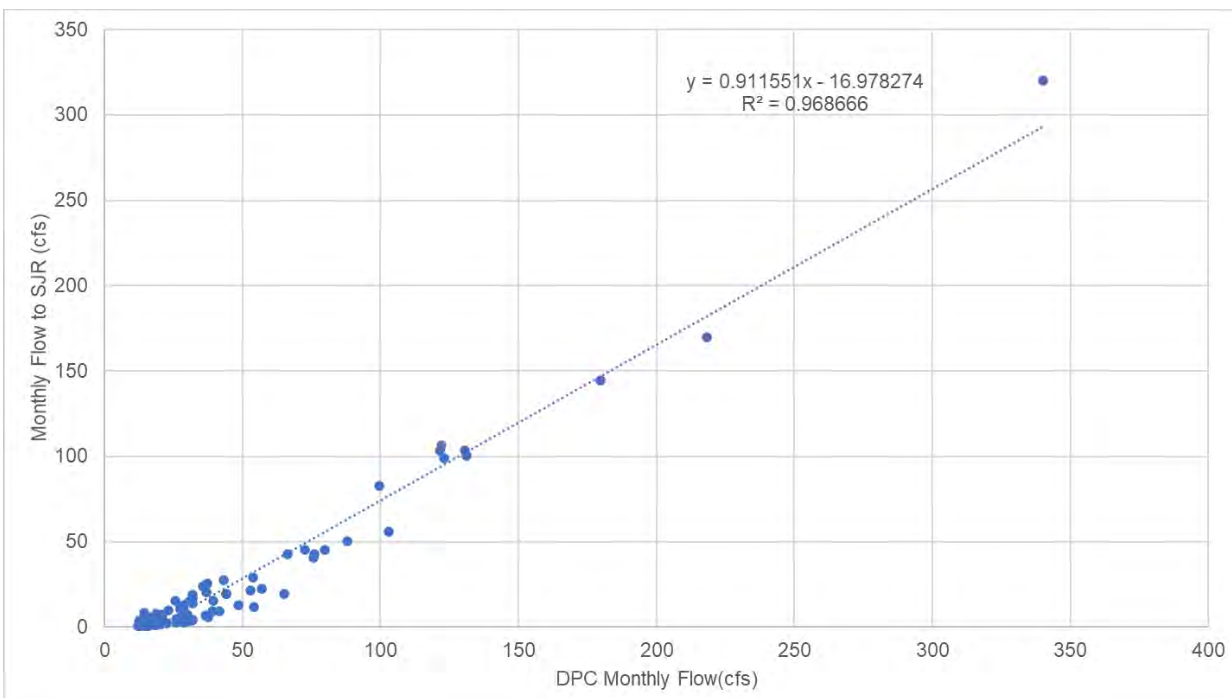


Figure 11: Relationship Between Monthly Flow to SJR and Monthly DPC Flow



3.4 Quantification of Downstream Impacts

The following describes the estimated stream seepage and flow to SJR for the for "No Project" and "With Project" scenarios using the analytical approach described above. The results of the analysis show a reduction in both the downstream seepage and the flow to the SJR in the “With Project” scenario. Table 7 shows a direct comparison of these flows by water year. The streamflow would be reduced by an average 3,800 AFY, downstream seepage would be reduced by an average 2,100 AFY, and the flow to the SJR would be reduced by an average of 1,700 AFY.

Table 7: Annual Average Summary (AFY)

-	No Project Conditions			With Project Conditions		
Year Type (Sac Index)	**DPC Flow**	**Downstream Seepage**	**Flow into SJR**	**DPCR Releases**	**Downstream Seepage**	**Flow into SJR**
1 - Wet	9,600	4,700	4,900	2,100	1,000	1,100
2 - Above Normal	5,900	3,500	2,400	500	300	200
3 - Below Normal	1,500	1,000	600	-	-	-
4 - Dry	1,000	900	100	-	-	-
5 - Critical	800	700	100	-	-	-
Average	**4,500**	**2,500**	**2,100**	**700**	**400**	**400**

3.4.1 Reduction of Flow to SJR

With the proposed project, there will be a reduction in flow to the SJR. With the project, a portion of the DPC flows will be diverted and stored for beneficial use in the DPCR, a portion would be set aside for potential diversion by the City of Patterson for beneficial use, and the rest would flow through and either seep into the groundwater or flow to the SJR. The breakdown of these flows compared to the No Project scenario is shown in Table 8 below. Table 9 shows the average monthly flows to the SJR under the No Project and With Project conditions. These estimations show that approximately 0.07% of the SJR flow is from the DPC in current conditions, which is decreased to 0.01% with the project. Almost all of the change in flow into the SJR occurs in wet and above normal years.

Table 8: Average Annual DPC Flow, Seepage and SJR Flow (AFY)

	No Project	**With Project**
Original DPC Flow	4,500	4,500
DPC Diverted Flow to DPCR	n/a	2,700
DPC Flow to Patterson	n/a	1,100
DPC Flow Released from DPCR	n/a	700
Downstream Seepage	2,500	400
Flow into SJR	2,100	400
SJR Flow[1]	3,137,000	3,135,300
Percentage of DPC flow into SJR	0.07%	0.01%

1. CalSim2 Flow at Vernalis for 1921-2003 period.

Table 9: Monthly Average DPC Flow and Flow to SJR (AF)

Flow to SJR	**OCT**	**NOV**	**DEC**	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**
Without Project	-	-	50	370	920	540	150	10	10	-	-	-
With Project	-	-	-	110	130	80	50	10	10	-	-	-
Reduction	-	-	50	260	790	460	100	-	-	-	-	-

3.4.2 Reduction of Seepage to Groundwater

The impact of reduction in seepage to the groundwater basin must consider both the seepage from the stream downstream of the reservoir, as well as the seepage from the dam itself. The seepage from the reservoir was estimated using the methodology described in Section 3.3.3. The results of this analysis show that an average of 900 AFY seep from the dam to the groundwater basin. Without the reservoir, this seepage would not occur. The comparison of total seepage with project versus no project is shown in Table 10. The project would reduce the total seepage to groundwater basin by approximately 1,300 AFY. This is approximately equal to the amount of water being supplied to the City of Patterson by the project, resulting in no net negative change in water supply for groundwater pumpers downstream of the DPCR.

Table 10: Average Annual Total Seepage (AFY)

	No Project	With Project		
Year Type (Sac Index)	**Seepage**	**Downstream Seepage**	**Dam Seepage**	**Total Seepage**
1 - Wet	4,700	1,000	800	1,800
2 - Above Normal	3,500	300	800	1,100
3 - Below Normal	1,000	-	900	900
4 - Dry	900	-	900	900
5 - Critical	700	-	1,000	1,000
Average	**2,500**	**400**	**900**	**1,200**

3.4.3 Patterson Releases ~~as Mitigation~~

The City of Patterson has planned to use stormwater flows from Del Puerto Creek as a future water supply, as described in their most recent Water Master Plan (RMC, 2018). The City planned on a stormwater capture yield of 1,700 AFY under average year conditions, 1,275 AFY in a dry year, and 0 AFY in a sustained drought. If available, the model simulates the release of these quantities for the City of Patterson in each year ~~as mitigation~~ under the assumption that ~~the City would capture these~~ Del Puerto Creek flows would be allowed to pass through the reservoir so that the City could capture them in the future with their proposed project.

The rules applied to implement this requirement in the model are:

- In Wet, Above Normal, and Below Normal water years (using the SJR Index), up to 1,700 AFY will be released ~~as mitigation~~
- In Dry and Critically Dry years, up to 1,275 AFY will be released ~~as mitigation~~, unless the previous year was a Dry or Critically Dry year, in which case there will be no releases.
- Releases to the City of Patterson only occur in the months of September through May.

In years in which the DPC inflow is not sufficient to supply both environmental releases and Patterson releases ~~as mitigation~~, environmental releases take priority. There are approximately 27 of the 82 modeled years in which there is not sufficient natural DPC flow to meet both environmental and Patterson release requirements. Based on the availability of natural DPC flows, Patterson releases ~~as mitigation~~ average approximately 1,~~470~~400 AFY in wet, above normal, and below normal years, and 1,~~070~~000 AFY with all year types considered (using the SJR Index).

3.5 System Summary

Table 11 summarizes the system information used in the operations model, including capacities, flows and other relevant information.

Table 11: System Information and Inputs for Model

DPWD Operations	
Total Storage	20,000 AF in DPCR (25% of total available storage). End of February storage in DPCR should always be at least 5,000 AF. 14,000 AF in SLR. It is assumed that the project would not affect DPWD's operation of SLR.
Put	Refill as much as possible Sept-Feb
Take	Take as much as possible starting in March. ~~Take first from DPCR, then SLR.~~
~~Supply (CVP)~~	~~Contract Amount * CVP SOD Ag allocation in each year, taken from CalSim 2~~ ~~100% CVP Allocation = 140,210 AFY~~
~~Supply (NVRRWP)~~	~~18,200 AFY~~
~~Demand~~	~~Monthly demand pattern based on average of 17 years of data provided by DPWD. Assumed to be the same for all year types.~~ ~~Annual demand ranges from 59,000 AFY to 87,000 AFY and is dependent on water year type (SJR Index)~~
Exchange Contractors Operations	
Total Storage	40,000 AF (49% of total available storage)
Put	Refill pool during Oct – Feb period, as early as possible given capacity & water rights constraints
Shasta Critical Year Take	Shasta Critical Year: Half of stored water Take split evenly between April and May
Transfer Take	If current water year Shasta inflow < 4.0 MAF inflow or previous year was Shasta critical year: Transfer 0 AF If current water year Shasta inflow > 4.0 MAF inflow: Transfer 20,000 AF Take distributed evenly Mar – ~~Sept~~ Aug
Water Transfer Operations	
Total Storage	10,000 AF in DPCR (12% of total available storage)
Put	Put as much as possible to fill the reservoir Oct-Feb except in SJR Index critically dry years. No put in SJR Index critically dry years.
Take	Take as much as possible to drain the reservoir spread evenly Mar-Aug except in SJR Index critically dry years. No take in SJR Index critically dry years.
Refuges Operations	
Total Storage	11,000 AF (14% of total available storage)
Put	Put as much as possible Oct-Feb to fill the reservoir. Only constrained by the Jones export as stored water constraint.
Take	Take as much as possible Mar-Aug to drain the reservoir.

Operational Constraints	
Conveyance Capacity	300 cfs for put 380 cfs for take Conveyance capacity is allocated to project partners based on their storage allocation. If one partner is using less than its allocation of the conveyance capacity, they get to use all that they want. The other partners split the remaining available capacity if they are attempting to use more than their allocations.
DMC Capacity Constraint	The takes for each Project Partner are spread out over the months which they would like to take in each year such that they do not exceed the available capacity in the DMC where the water will be conveyed to landowners and transfer partners
Jones Export as Stored Water Constraint	Puts are limited by estimated portion of Jones pumping that originated from a storage withdrawal in each month
Put Rules	Can't put and take water in the same month Can't put water in pool if there is no storage capacity available
Del Puerto Canyon Reservoir	
Design Capacity	82,000 AF
Emergency Storage (Dead Pool)	1,000 AF
Flood Pool	0 AF (based on the results of flood analysis in support of the project. it is assumed that pre-releases made in response to flood forecasting allow the project to fully capture all flood flows without the need for a dedicated flood pool)
Other Outflows	
Environmental Releases	Based on 7-day recession curve for peak events to match natural hydrology of DPC Average ~~540~~530 AFY. Maximum 600 cfs.
Patterson Releases~~ as Mitigation~~	Based on yield of up to 1,700 AFY in wet, above average, and below average water years and up to 1,275 AFY in dry and critically dry years (reduced to 0 AFY if the previous year was also a dry or critically dry year) using the SJR Index for water year types Average 1,~~070~~000 AFY (all years, SJR Index). Maximum 600 cfs.
Evaporation	Calculated using monthly Modesto pan evaporation data (1987-2018), storage-surface area curve, and pan evaporation constant (1.538)
Dam Seepage	200-1,100 AFY
Excess Flows (Transferable Storage or Spills)	Occur when Del Puerto Creek inflows exceed available space in DPCR storage pools
Flood Releases	None
Hydrology – Del Puerto Creek	
Peak Month Average Flow	340 cfs
Monthly Average Flow	6.4 cfs
Seasonal Pattern	Typically Flows Nov – July Typically Dry Aug - Oct
Nearest USGS Stream Gage	USGS 11274630

	DEL PUERTO C NR PATTERSON CA
Data Available	1965-2019
Hydrology – Other	
Water Year Type Designations	Shasta Index used for Exchange Contractors Operations SJR Index used for ~~DPWD~~ Water Transfer Operations and Patterson releases Sacramento River Index (Sac Index) used to report results for consistency with typical reporting of CVP/SWP operational results

3.6 Summary of CalSim 2 Data Used in the DPCR Operations Analysis

The DPCR operations model has been simulated using monthly input and output data from the ~~2017 State Water Project Delivery Capability Report version of the CalSim 2 model (https://water.ca.gov/Library/Modeling-and-Analysis/Central-Valley-models-and-tools/CalSim-2/DCR2017).~~Revised No Action Alternative (09/30/2019 version) CalSim 2 model developed by the U.S. Bureau of Reclamation for the EIS Administrative Draft Analysis for the Re-initiation of Consultation on the long-term operations of the Central Valley Project and State Water Project. In addition, a sensitivity analysis reviewing the results with the Revised Project Alternative (10/04/2019) version of the CalSim 2 model is in Section 4.6. The following CalSim 2 input and output data is used in the DPCR operational analysis.

- ~~Annual CVP contractor allocations:~~
  - ~~The South-of-Delta CVP agricultural contractor allocation (CVPAG_S) and CVP exchange contractor allocation (CVPEX_S) is used to determine the quantity of CVP contract water available to each project partner in each year~~
- ~~Monthly CVP San Luis Reservoir storage (S12) is used to determine the available storage space for CVP contractor storage in San Luis Reservoir~~
- Lake Shasta inflow (I4) is used to determine the take rules in each year for the Exchange Contractors' DPCR storage pool.
- The annual San Joaquin River index water year type (included in the wytypes file in CalSim 2) is used to ~~set the annual water demands for water delivery for DPWD~~ determine takes for the Water Transfer Partner and the annual Sacramento index water year type (also included in wytypes in CalSim 2) is used for reporting of results~~ and potential participant A~~.
- The Jones export as stored water constraint is calculated for each month using monthly inflows and releases for Whiskeytown, Shasta, and Folsom Reservoirs and the monthly pumping at Jones pumping plant. The following calculations are used:
  - Whiskeytown storage withdrawal = max (D3 + C3 – I3, 0.0)
  - Shasta storage withdrawal = max (C4 – I4, 0.0)
  - Folsom storage withdrawal = max (D8+D9+C9-I8-C300, 0.0)
  - Jones pumping = D418
  - Jones export as stored water constraint = min (Jones pumping, Sum of Whiskeytown, Shasta, and Folsom storage withdrawal)

- San Joaquin River flow at Vernalis (C639) is used to estimate the percent contribution of Del Puerto Creek flow to total San Joaquin River flow.
- DMC flow arc C700 and intertie flow arc C700A are used to determine the available capacity in the DMC to convey supply taken from the DPCR.

3.6.1 CalSim 2 Model Limitations

CalSim 2 is a monthly model developed for planning-level analyses. The model is run for an 82-year historical hydrologic period and uses a projected level of hydrology and demands and an assumed framework of regulations. The simulation does not provide information about historical conditions, but it does provide information about variability of conditions that would occur at the assumed level of hydrology and demand with the assumed operations, under the same historical hydrologic sequence. CalSim 2 is not physically based model and is therefore not calibrated. It is intended to be used in a comparative manner appropriate for a planning level analysis.

In CalSim 2, operational decisions are made on a monthly basis, based on a set of pre-defined rules that represent the assumed regulations. CalSim 2 results differ from real-time operations because the model is unable to make unique real-time policy decisions such as actual human operators do. Results should not be interpreted to reflect literally what would occur in the future. In real-time operations, stressed water supply conditions would be avoided by making policy decisions on requirements in prior months. In actual future operations, operators would work in real time to satisfy legal and contractual obligations given current conditions and hydrologic constraints.

4. ANALYSIS RESULTS

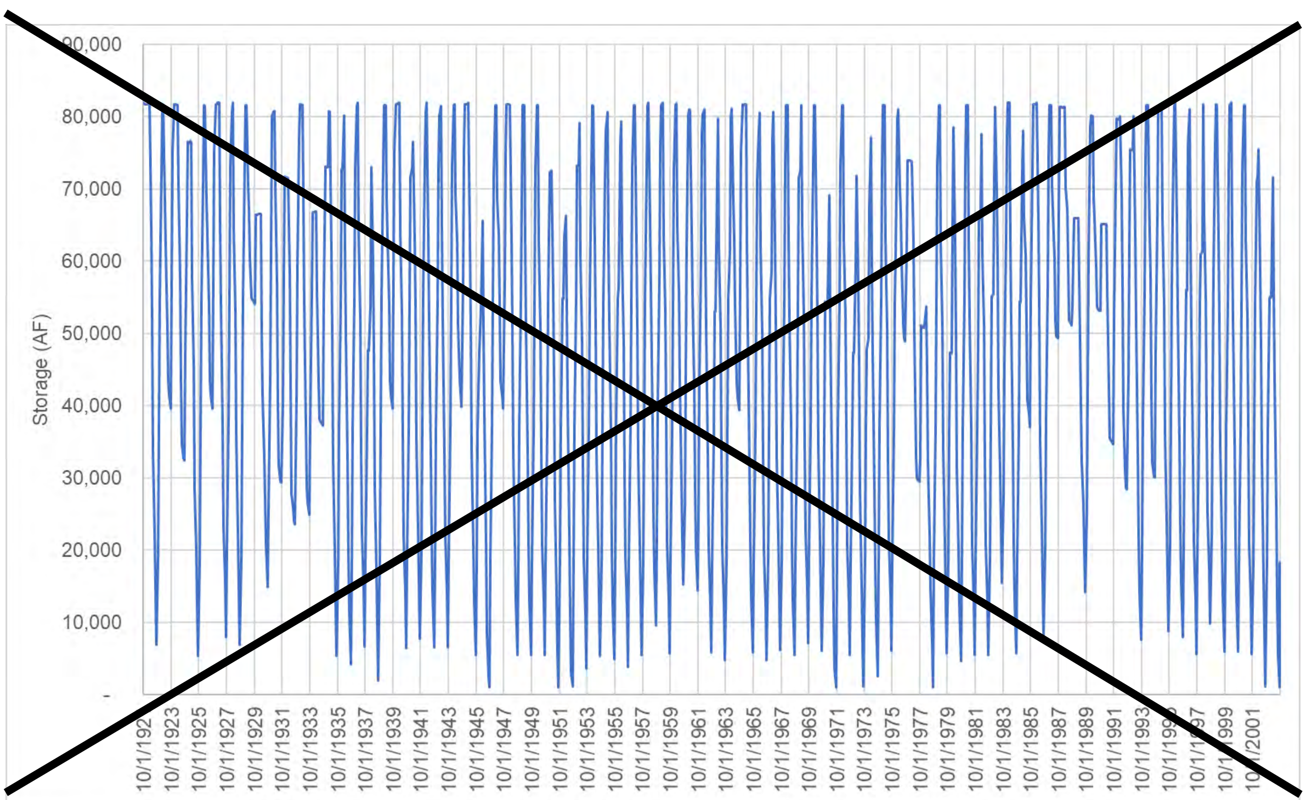
4.1 Environmental Considerations

The modeled results relevant to environmental considerations are shown in Tables 12-17 and Figures ~~6-11~~12-17. For consistency with typical reporting of CVP/SWP operational results, all results are reported using the Sacramento River Index.

Total DPCR Storage and Elevation
storage.

Figure 12 ~~6~~ shows total DPCR Storage or the total storage from all four partner pools. The reservoir is regularly drained and refilled in most years. Figure 13 ~~7~~ ~~shows~~ and Table 12 show the reservoir is full or mostly full January through March and then starts to drain until ~~September~~ October, when it then starts to refill. Storage is slightly greater in dry years since some project partners are assumed to hold their water in the reservoir during dry years as an emergency reserve. The modeled elevation for DPCR ~~is~~ are shown in Figures 14 ~~8~~ and 15 ~~9~~ and Table 13. Given that elevation is a direct function of storage, these figures show the same trends as storage.

Figure 12 ~~6~~: Total DPCR Storage (Oct 1921 - Sept 2003)



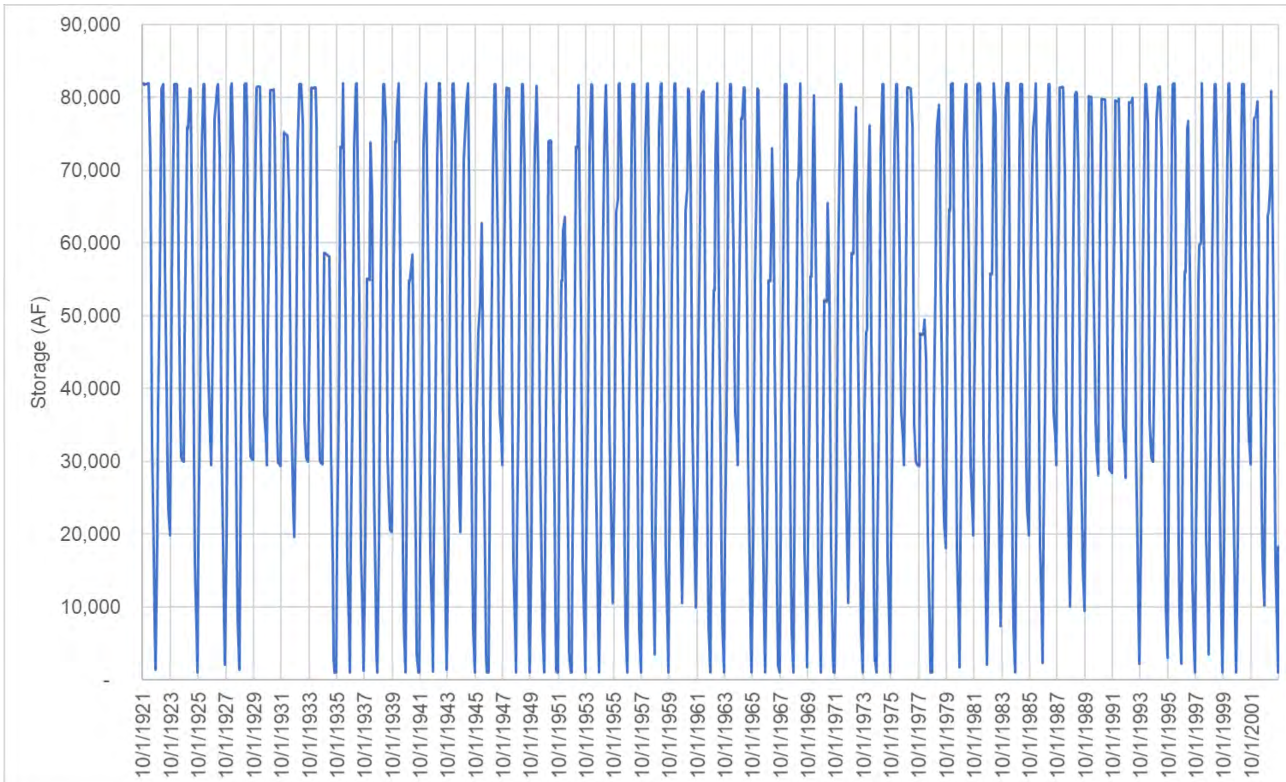
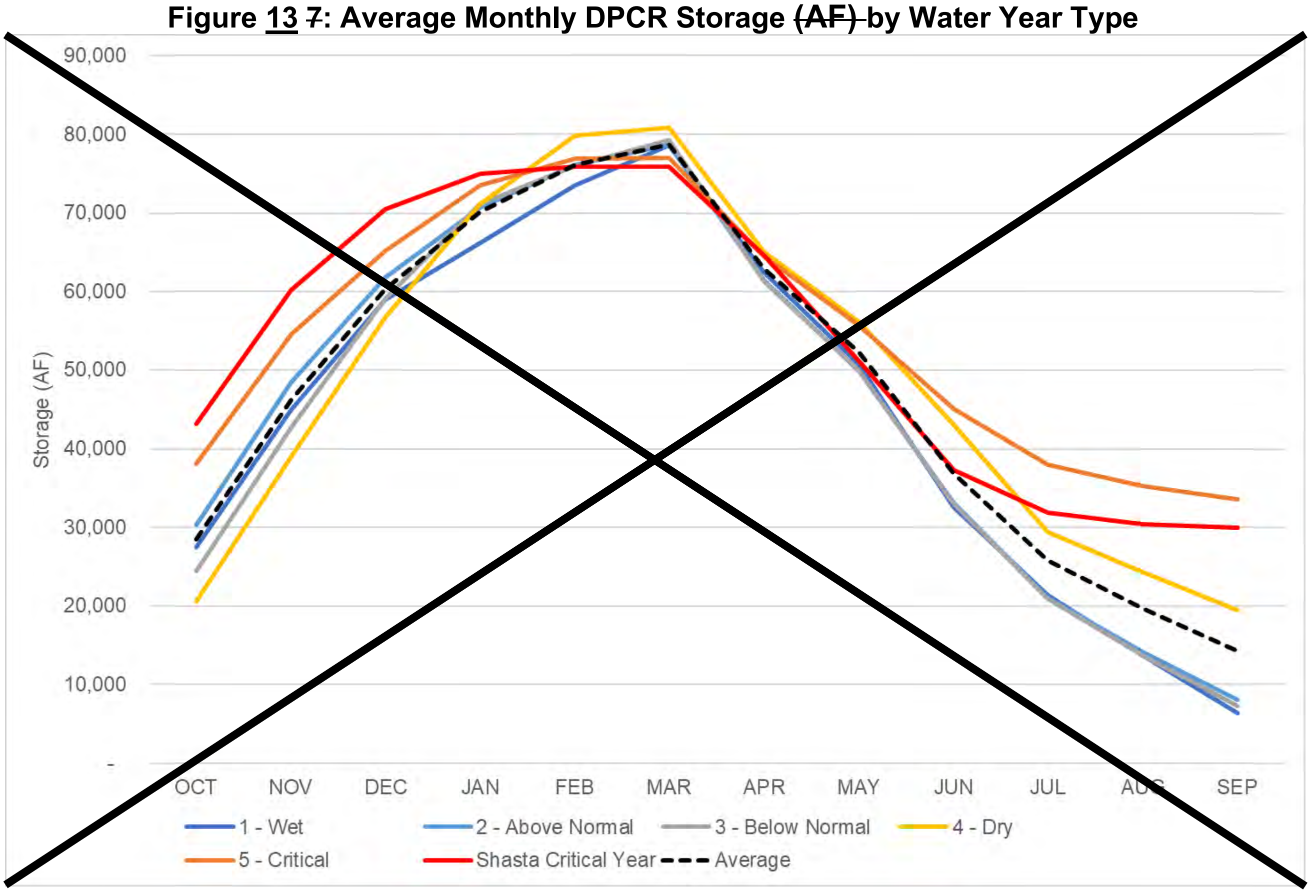


Figure 13 ~~7~~: Average Monthly DPCR Storage ~~(AF)~~ by Water Year Type



~~Year Type (SJR Index)~~	~~OCT~~	~~NOV~~	~~DEC~~	~~JAN~~	~~FEB~~	~~MAR~~	~~APR~~	~~MAY~~	~~JUN~~	~~JUL~~	~~AUG~~	~~SEP~~
~~1 - Wet~~	~~27,468~~	~~45,008~~	~~58,944~~	~~66,238~~	~~73,544~~	~~78,641~~	~~62,508~~	~~50,682~~	[illegible]	~~21,390~~	~~13,672~~	~~6,386~~
~~2 - Above Normal~~	~~30,292~~	~~48,471~~	~~61,793~~	~~70,739~~	~~76,153~~	~~78,656~~	[illegible]	~~49,882~~	~~33,131~~	~~21,088~~	~~14,191~~	~~8,115~~
~~3 - Below Normal~~	~~24,450~~	~~42,714~~	~~59,038~~	[illegible]	[illegible]	~~79,216~~	~~61,359~~	~~49,892~~	~~33,036~~	~~20,932~~	~~13,661~~	~~7,341~~
~~4 - Dry~~	~~20,647~~	~~38,971~~	~~56,705~~	~~71,172~~	~~79,828~~	[illegible]	~~65,055~~	~~56,163~~	~~43,065~~	~~29,412~~	~~24,345~~	~~19,524~~
~~5 - Critical~~	~~38,072~~	[illegible]	~~65,120~~	~~73,558~~	~~76,867~~	~~76,964~~	~~64,513~~	~~55,745~~	~~45,097~~	~~37,932~~	~~35,295~~	~~33,597~~
~~Shasta Critical Year~~	~~43,214~~	~~60,151~~	~~70,466~~	~~75,008~~	~~75,905~~	~~75,923~~	~~64,622~~	~~51,192~~	~~37,267~~	~~21,886~~	~~30,428~~	~~30,019~~
~~**Average**~~	~~**28,528**~~	~~**46,233**~~	~~**60,365**~~	~~**70,106**~~	~~**76,095**~~	~~**78,751**~~	~~**62,921**~~	~~**52,258**~~	~~**36,862**~~	~~**25,758**~~	[illegible]	~~**14,267**~~

~~**DPCR Elevation**~~

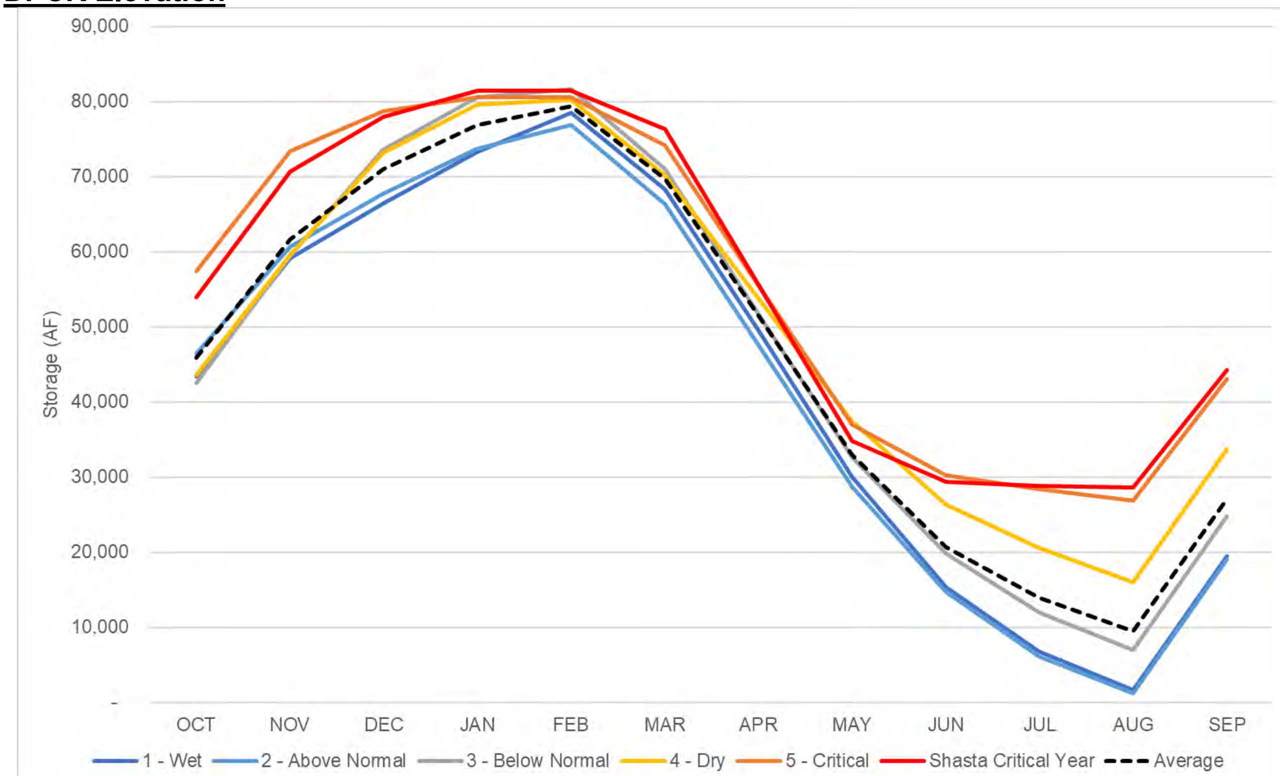
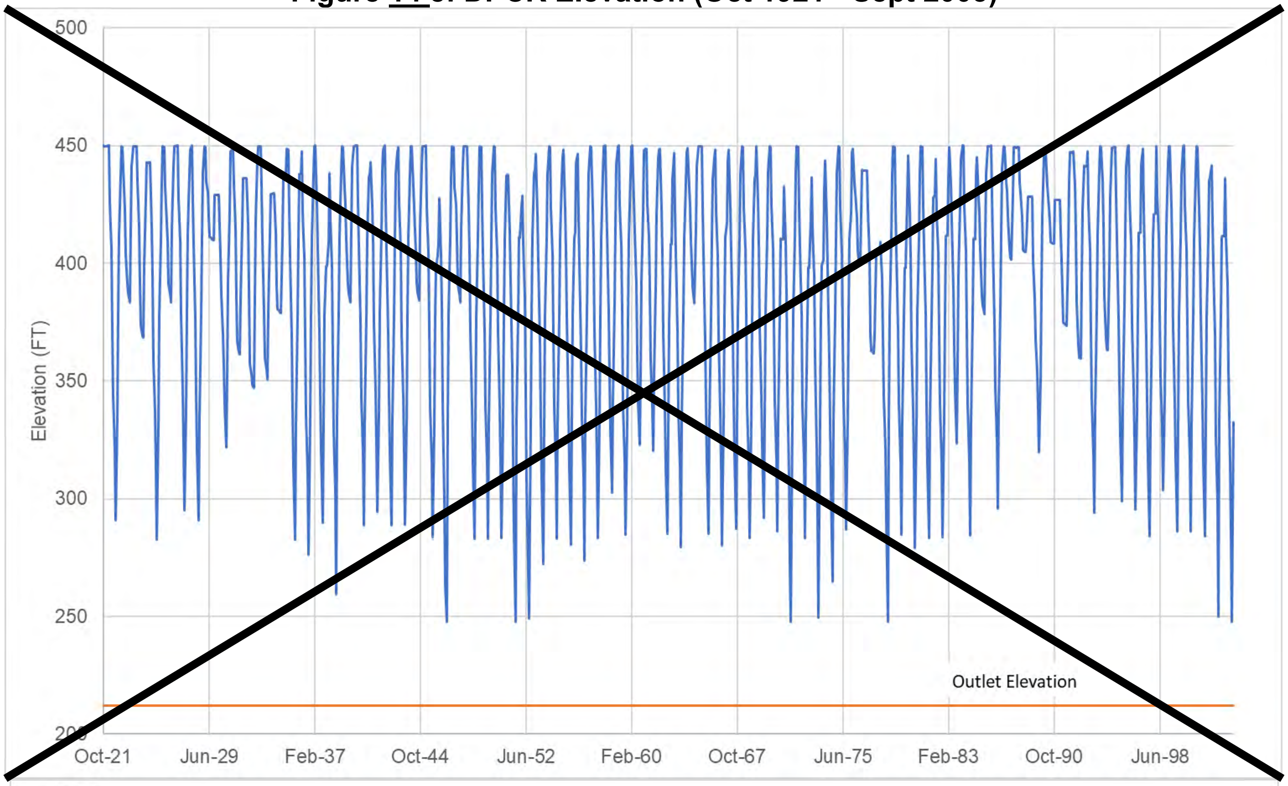


Table 12: Average Monthly DPCR Storage (AF) by Water Year Type

Year Type (Sac Index)	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1 - Wet	43,360	59,190	66,460	73,280	78,540	68,270	49,640	30,070	15,370	6,820	1,710	19,540
2 - Above Normal	46,470	60,680	67,750	73,680	76,890	66,330	47,650	28,690	14,710	6,150	1,260	19,050
3 - Below Normal	42,530	59,490	73,660	80,540	81,680	71,040	51,800	32,590	19,840	12,040	7,040	24,850
4 - Dry	43,590	59,590	73,130	79,620	80,270	70,170	53,800	37,470	26,390	20,550	16,040	33,780
5 - Critical	57,410	73,430	78,750	80,610	80,620	74,130	55,630	36,970	30,260	28,440	26,890	43,120
Shasta Critical Year	53,930	70,730	78,000	81,440	81,450	76,350	55,700	34,770	29,360	28,840	28,620	44,320
Average	**45,860**	**61,650**	**71,050**	**76,940**	**79,420**	**69,660**	**51,510**	**33,000**	**20,730**	**13,930**	**9,540**	**27,100**

Figure 14 ~~8~~: DPCR Elevation (Oct 1921 - Sept 2003)



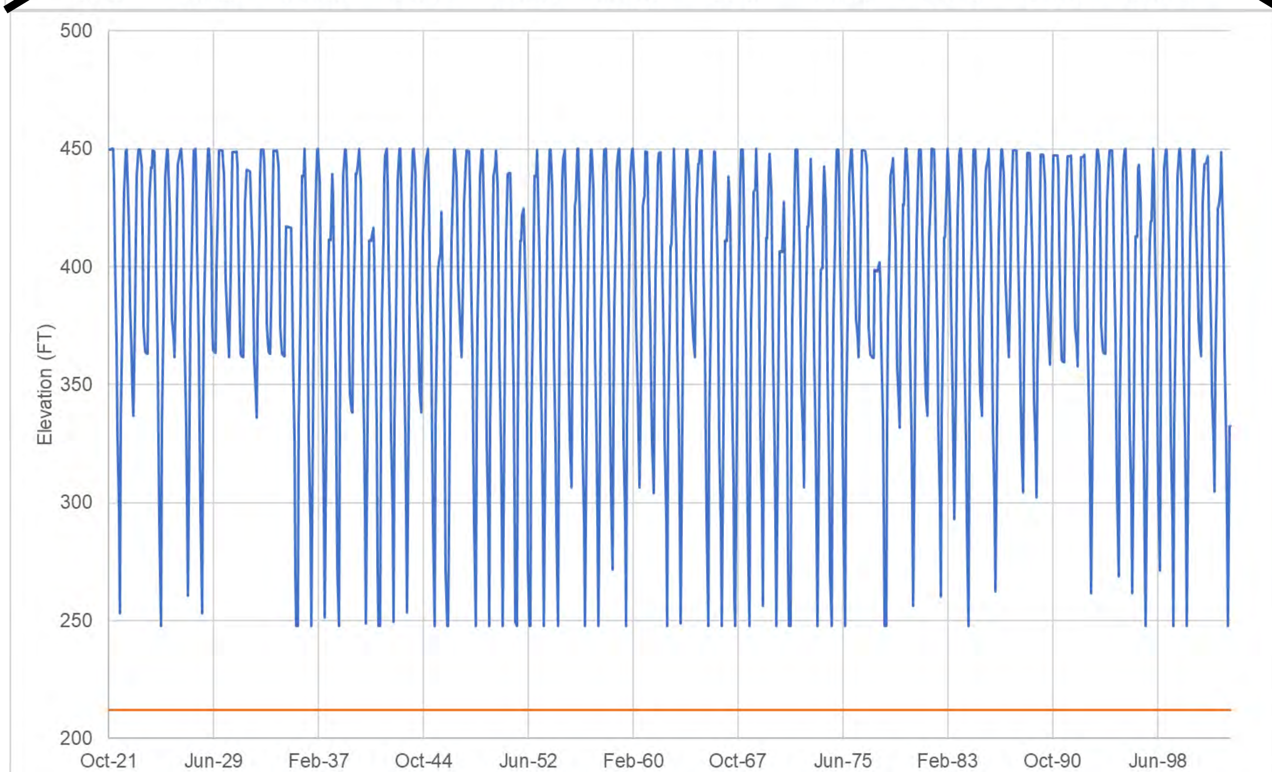
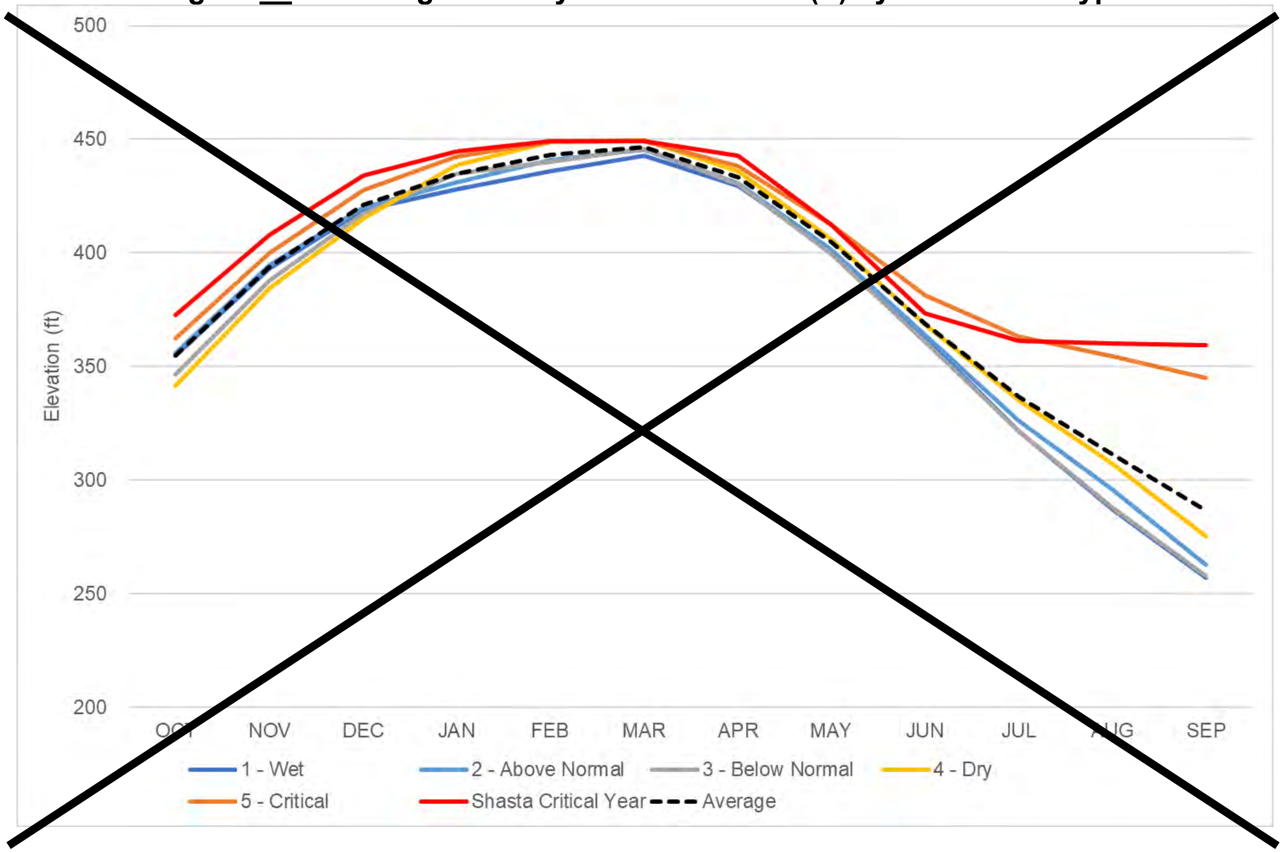


Figure <u>15</u> ~~9~~: Average Monthly DPCR Elevation ~~(ft)~~ by Water Year Type



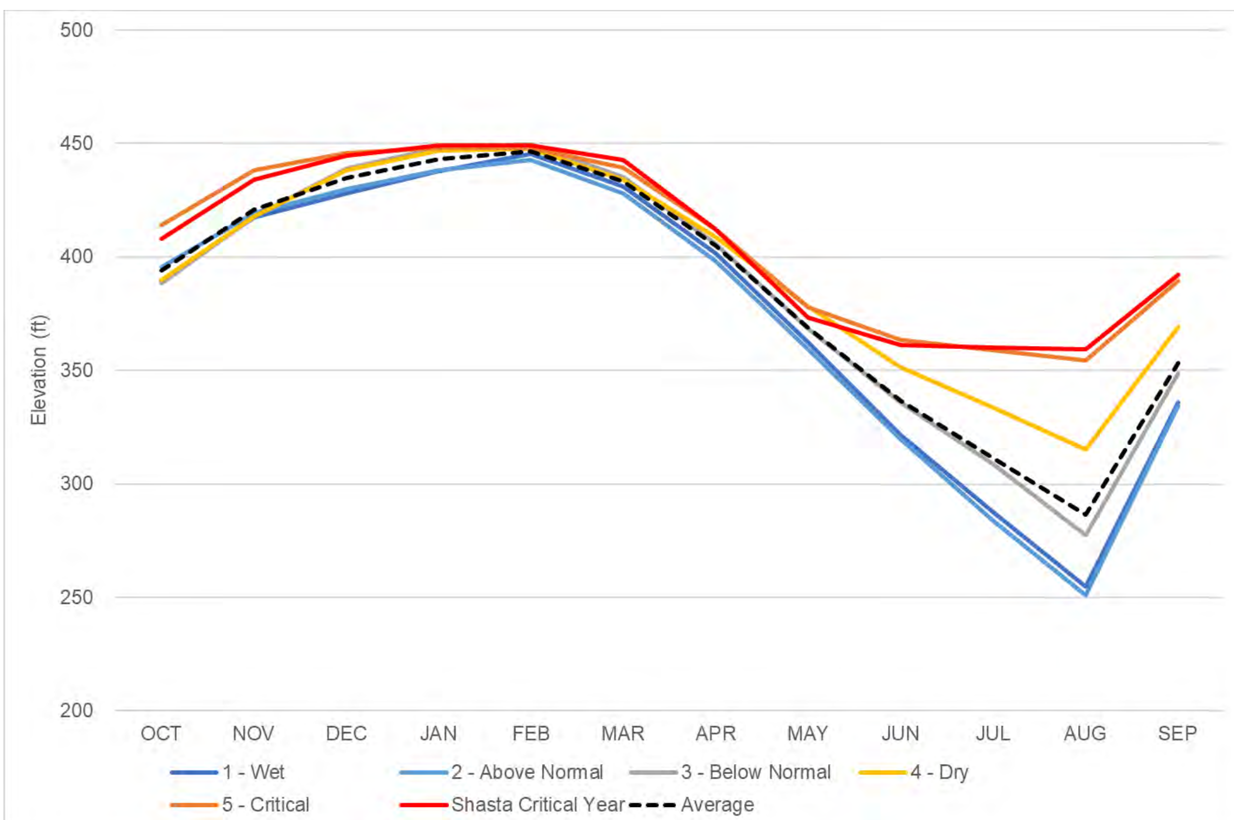


Table 13: Average Monthly DPCR Elevation (FT) by Water Year Type

Year Type (Sac Index)	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1 - Wet	390	420	430	440	450	430	400	360	320	290	250	340
2 - Above Normal	400	420	430	440	440	430	400	360	320	280	250	330
3 - Below Normal	390	420	440	450	450	440	410	370	340	310	280	350
4 - Dry	390	420	440	450	450	430	410	380	350	330	320	370
5 - Critical	410	440	450	450	450	440	410	380	360	360	350	390
Shasta Critical Year	410	430	450	450	450	440	410	370	360	360	360	390
Average	**390**	**420**	**440**	**440**	**450**	**430**	**410**	**370**	**340**	**310**	**290**	**350**

DPCR Evaporation

Table 14 shows the modeled average monthly evaporation from DPCR by year type. Generally, more evaporation occurs in warm months (March through August) than the rest of the year. Evaporation is also slightly greater in dry years than in wet years since the reservoir is more full and has more surface area in these years. Evaporation ranges from ~~43~~10 AF/mon to ~~221~~230 AF/mon, with an average monthly evaporation of ~~118~~110 AF.

Table 14: Average Monthly Evaporation (AF) by Water Year Type

Year Type (SJR Index)	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1 - Wet	[illegible]	51	38	41	76	151	186	217	[illegible]	156	108	53
2 - Above Normal	80	54	[illegible]	43	78	151	[illegible]	215	194	154	107	54
3 - Below Normal	72	50	38	43	[illegible]	152	184	215	194	153	106	51
4 - Dry	67	47	[illegible]	43	80	[illegible]	191	231	224	183	141	88
5 - Critical	[illegible]	58	41	44	78	149	190	[illegible]	230	211	175	127
Shasta Critical Year	99	61	43	45	78	148	190	218	207	[illegible]	163	121
Average	**78**	**52**	**39**	**43**	**78**	**151**	**187**	**221**	**205**	**170**	**126**	[illegible]

Year Type (Sac Index)	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1 - Wet	80	50	40	40	70	150	190	220	180	130	70	20
2 - Above Normal	80	50	40	40	70	150	190	210	180	130	70	10
3 - Below Normal	70	50	40	40	80	160	200	220	190	150	100	30
4 - Dry	80	50	40	40	70	160	200	230	200	170	130	80
5 - Critical	100	60	40	50	80	160	200	230	200	190	160	110
Shasta Critical Year	90	60	40	50	80	160	210	230	200	190	160	120
Average	**80**	**50**	**40**	**40**	**70**	**160**	**200**	**220**	**190**	**150**	**100**	**50**

DPCR Seepage

Table 15 shows the modeled average monthly seepage from DPCR by year type for each scenario. Seepage is fairly consistent between months and year types, and ranges from ~~40~~10 AF/mon to ~~98~~100 AF/mon, with an average monthly seepage of ~~75~~70 AF. Seepage is greater in winter months when the reservoir is more full.

Table 15: Average Monthly Seepage (AF) by Water Year Type

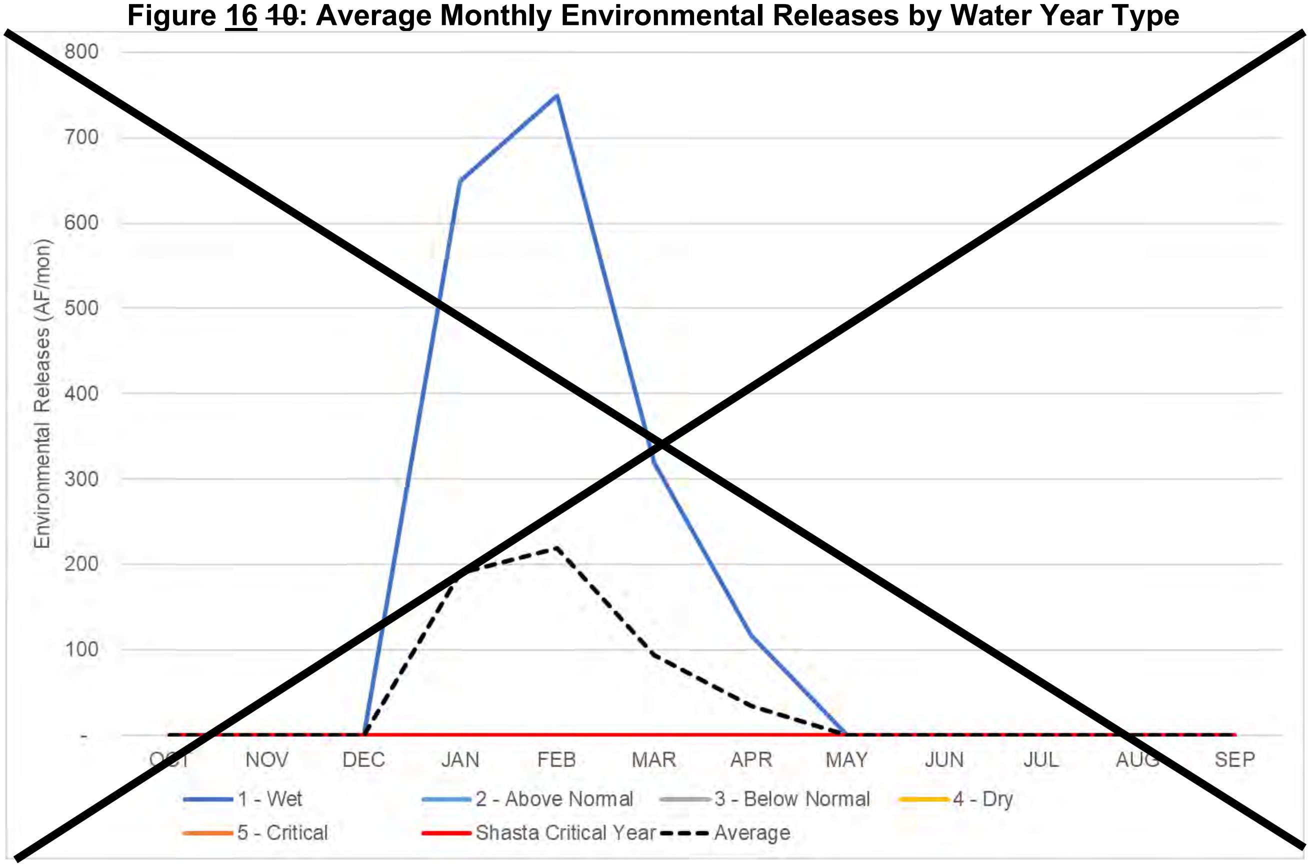
Year Type (SJR Index)	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1 - Wet	59	75	86	90	95	98	88	80	66	[illegible]	44	31
2 - Above Normal	62	[illegible]	88	93	96	98	88	[illegible]	66	54	44	30
3 - Below Normal	57	74	86	[illegible]	96	[illegible]	88	80	66	53	43	29
4 - Dry	53	71	85	[illegible]	98	[illegible]	90	84	74	62	56	47
5 - Critical	69	[illegible]	90	95	97	97	89	[illegible]	76	70	67	65
Shasta Critical Year	74	86	93	96	96	96	90	81	70	65	64	63
Average	**60**	**76**	**87**	**93**	**96**	**98**	**89**	**81**	**69**	**58**	[illegible]	**40**

Year Type (Sac Index)	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1 - Wet	60	70	90	90	90	100	90	80	60	50	30	10
2 - Above Normal	60	80	90	90	90	100	90	80	60	50	30	10
3 - Below Normal	60	70	90	100	90	100	90	80	60	50	40	20
4 - Dry	60	70	90	100	90	100	90	80	70	60	50	40
5 - Critical	70	80	100	100	90	100	90	90	70	60	60	60
Shasta Critical Year	70	80	100	100	90	100	100	90	70	60	60	60
Average	60	**80**	**90**	**100**	90	100	90	80	**70**	50	40	**30**

Environmental Releases and Excess Flows

Figure 16 ~~10~~ ~~shows~~ and Table 16 show the average monthly environmental releases by water year type. Environmental releases occur exclusively in January through April in wet years. Figure 17 ~~11~~ ~~shows~~ and Table 17 show the average monthly excess flows by water year type. Excess flows are modeled as "spills" in GoldSim. They occur when a project partner's pool is full and water flows into the pool from DPC. In reality, the reservoir would be operated to minimize any potential "spill." The model-simulated spills would either be released downstream into DPC, stored in the reservoir if another partner's allocation is not full, or used by a project partner. Excess flows occur in ~~January~~ December through March primarily in wet years.

Figure 16 ~~10~~: Average Monthly Environmental Releases by Water Year Type



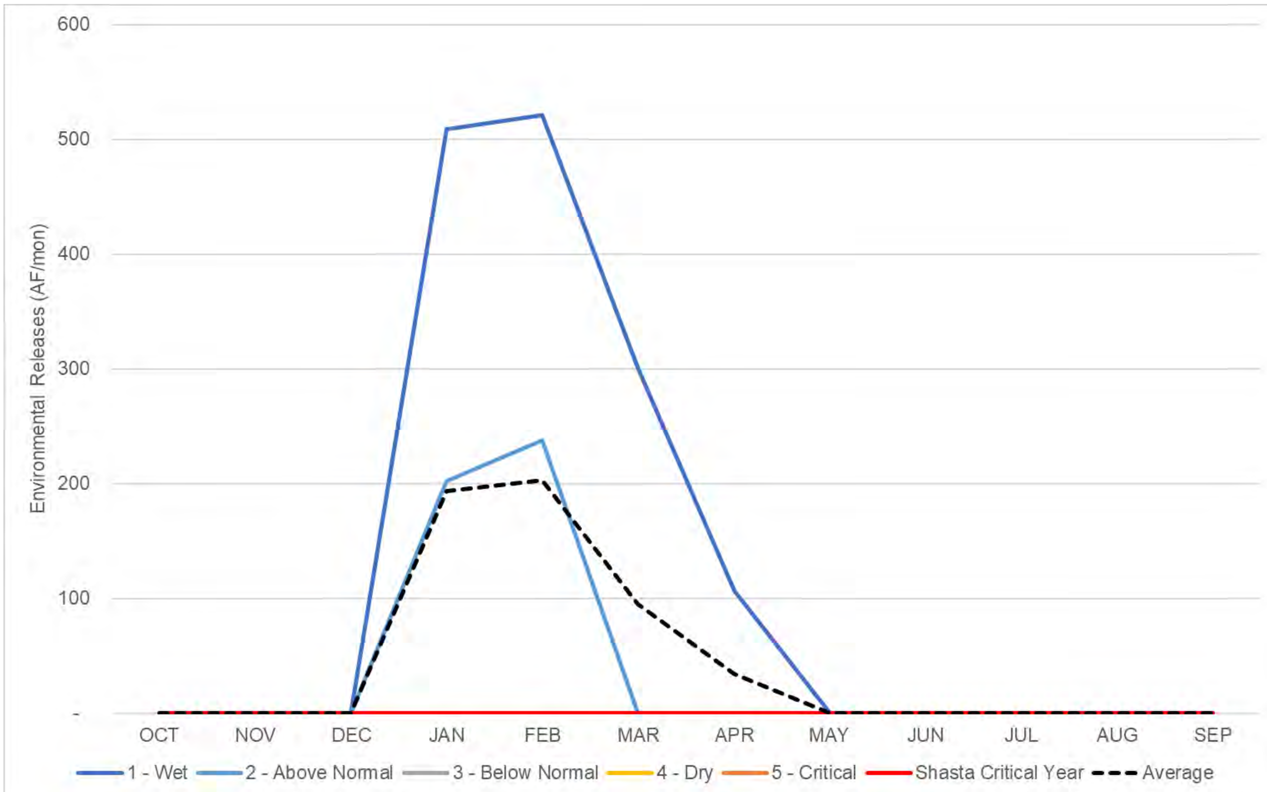
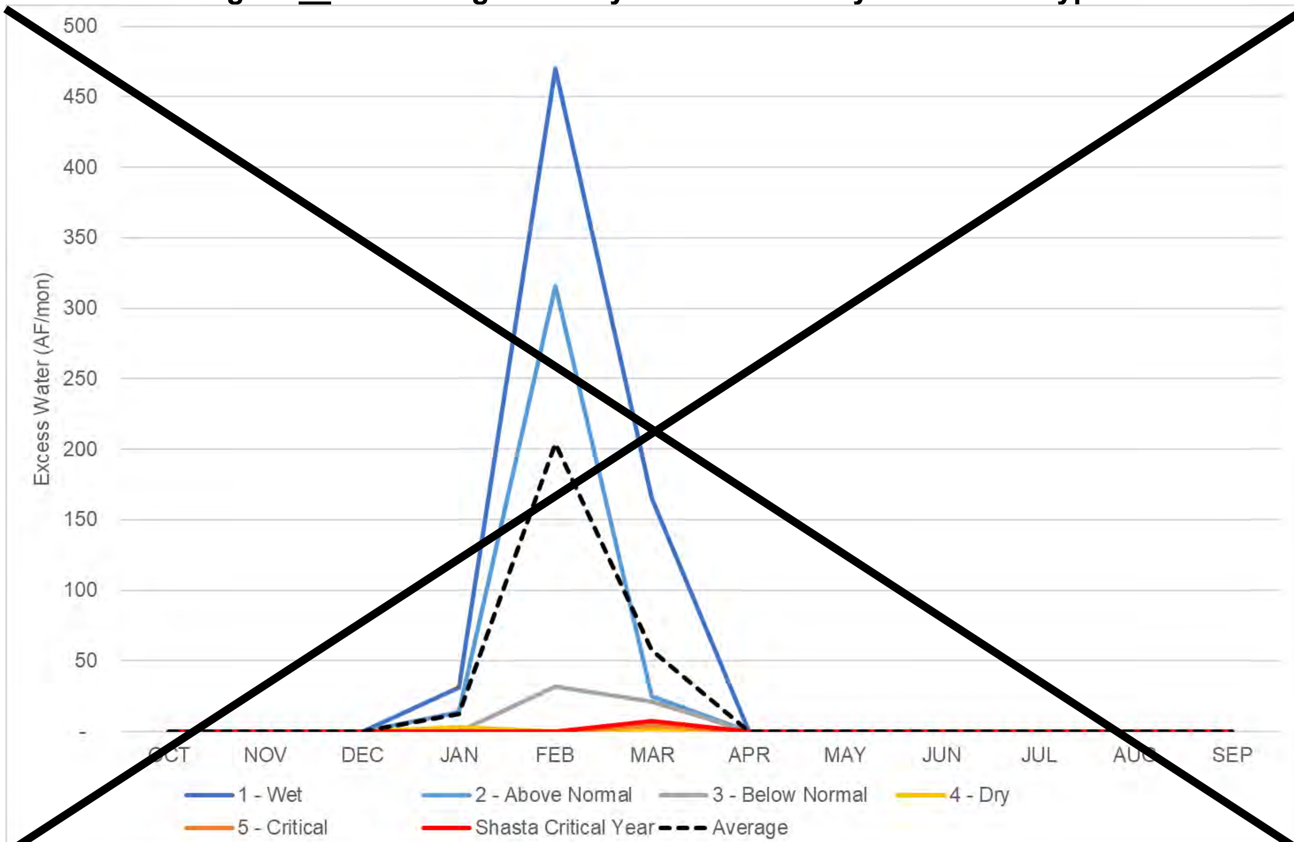


Table 16: Average Monthly Environmental Releases (AF) by Water Year Type

Year Type (SJR Index)	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1 - Wet	-	-	-	649	749	320	117	-	-	-	-	-
2 - Above Normal	-	-	-	-	-	-	-	-	-	-	-	-
3 - Below Normal	-	-	-	-	-	-	-	-	-	-	-	-
4 - Dry	-	-	-	-	-	-	-	-	-	-	-	-
5 - Critical	-	-	-	-	-	-	-	-	-	-	-	-
Shasta Critical Year	-	-	-	-	-	-	-	-	-	-	-	-
Average	**-**	**-**	**-**	**190**	**219**	**94**	**34**	**-**	**-**	**-**	**-**	**-**

Year Type (Sac Index)	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1 - Wet	-	-	-	510	520	300	110	-	-	-	-	-
2 - Above Normal	-	-	-	200	240	-	-	-	-	-	-	-
3 - Below Normal	-	-	-	-	-	-	-	-	-	-	-	-
4 - Dry	-	-	-	-	-	-	-	-	-	-	-	-
5 - Critical	-	-	-	-	-	-	-	-	-	-	-	-
Shasta Critical Year	-	-	-	-	-	-	-	-	-	-	-	-
Average	**-**	**-**	**-**	**190**	**200**	**100**	**30**	**-**	**-**	**-**	**-**	**-**

Figure <u>17</u> ~~11~~: Average Monthly Excess Flows by Water Year Type



Year Type (SJR Index)	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1 - Wet	[illegible]	-	-	31	470	165	-	-	-	[illegible]	-	-
2 - Above Normal	-	-	-	14	316	25	-	[illegible]	-	-	-	-
3 - Below Normal	-	-	-	-	32	21	-	-	-	-	-	-
4 - Dry	-	-	-	3	-	2	-	-	-	-	-	-
5 - Critical	-	-	-	-	-	4	-	[illegible]	-	-	-	-
Shasta Critical Year	[illegible]	-	-	-	-	7	-	-	-	-	-	-
Average	**-**	**-**	**-**	**12**	**204**	**58**	**-**	**-**	**-**	**-**	**-**	**-**

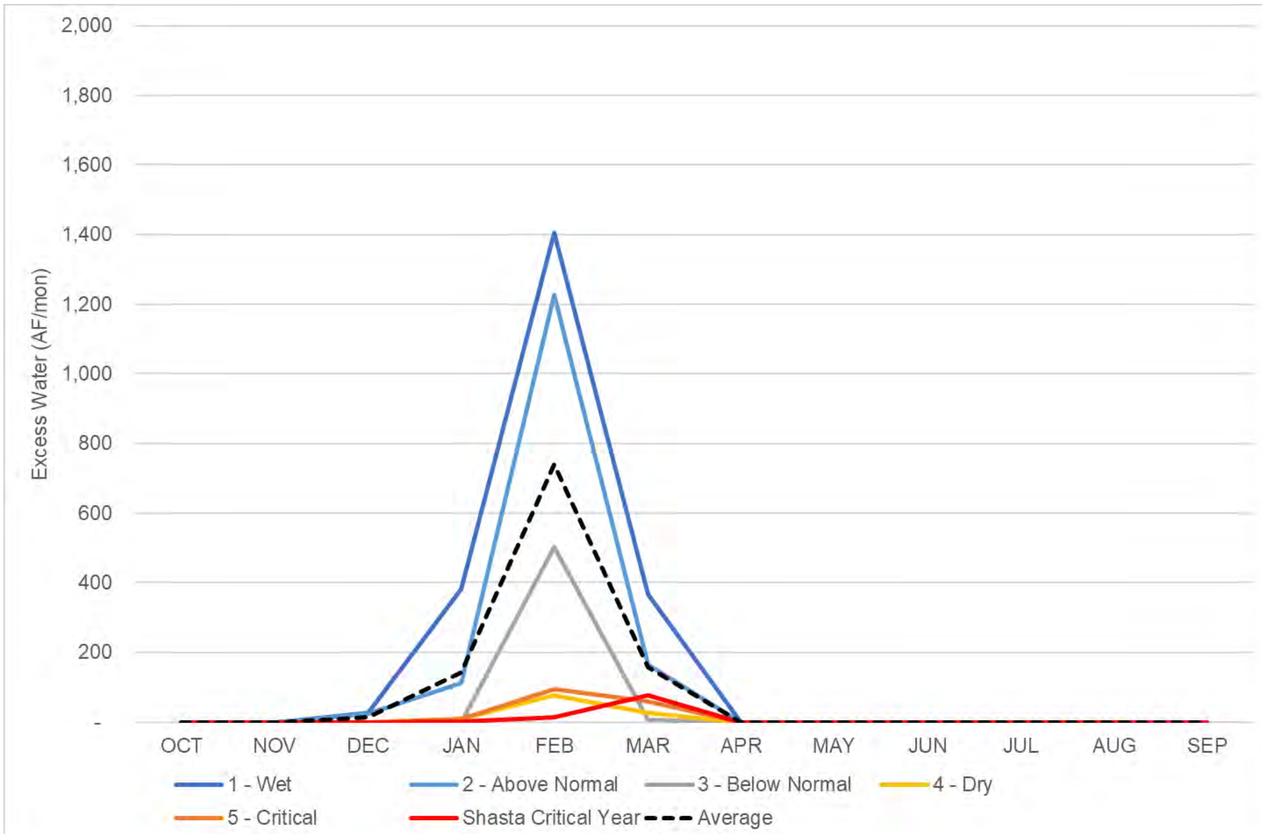


Table 17: Average Monthly Excess Flows (AF) by Water Year Type

Year Type (Sac Index)	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1 - Wet	-	-	30	380	1,410	370	-	-	-	-	-	-
2 - Above Normal	-	-	30	110	1,230	160	-	-	-	-	-	-
3 - Below Normal	-	-	-	-	500	10	-	-	-	-	-	-
4 - Dry	-	-	-	10	80	30	-	-	-	-	-	-
5 - Critical	-	-	-	10	90	60	-	-	-	-	-	-
Shasta Critical Year	-	-	-	-	10	80	-	-	-	-	-	-
Average	**-**	**-**	**10**	**140**	**740**	**160**	**-**	**-**	**-**	**-**	**-**	**-**

4.2 DPWD Operational Results

Figures ~~19 and 13~~ and Tables ~~14 through~~ 18 and 19 show the modeled operational results for DPWD. For consistency with typical reporting of CVP/SWP operational results, all results are reported using the Sacramento River Index.

~~Figure shows DPWD's modeled total demand, supply sources, and unmet demand for each CVP operational year (March to February) from 1922 through 2002. Unmet demand occurs during dry periods in the 1920s and 1930s as well as in the late 1970s and late 1980s through early 1990s. Supply stored in DPCR is utilized in every year and supply stored in SJR is utilized in almost every year. SJR supply is not available in the driest years.~~

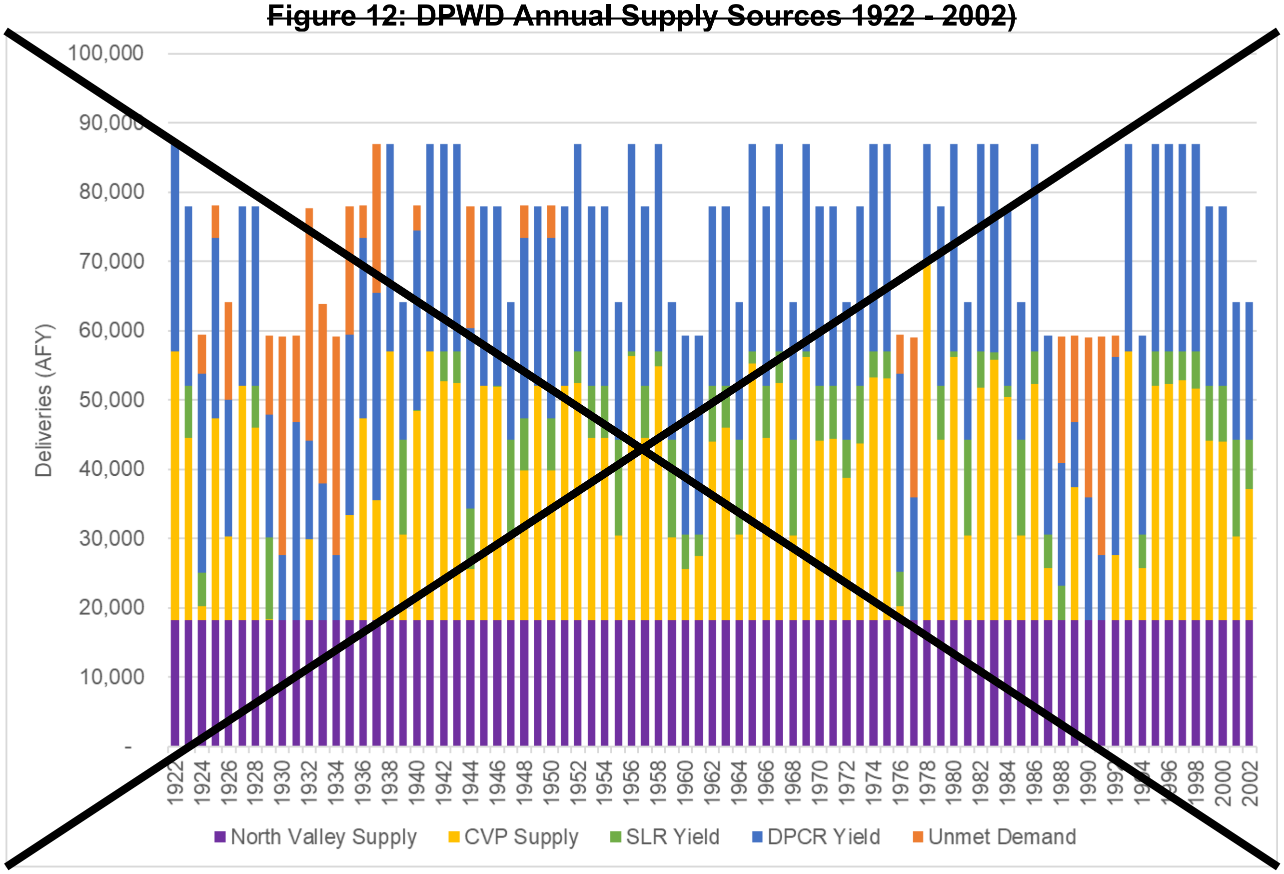
~~Table 14 shows DPWD's modeled average total demand, supply sources, and unmet demand by water year type. As years get drier, CVP supplies decrease and stored water from SLR and DPCR also decrease. Unmet demand increases in dry years.~~

Figure 18~~13~~ shows modeled storage over time in DPCR ~~and SLR. Both reservoirs are.~~ The reservoir is exercised ~~nearly every year. SLR is empty in the driest years as it is unable to be refilled with CVP water~~ every year.

Table 18 ~~15~~ shows DPWD's annual average DPCR put and yield by water year type. Yield ~~decreases~~ is supplemented in ~~drier~~ wet years ~~as less water is available to refill the reservoir in those years~~ by Del Puerto Creek flow.

Table 19 ~~16~~ shows DPWD's monthly average DPCR yield by water year type. The greatest yields occur in spring and summer, between March and ~~July~~ June.

~~**Figure 12: DPWD Annual Supply Sources 1922 - 2002)**~~

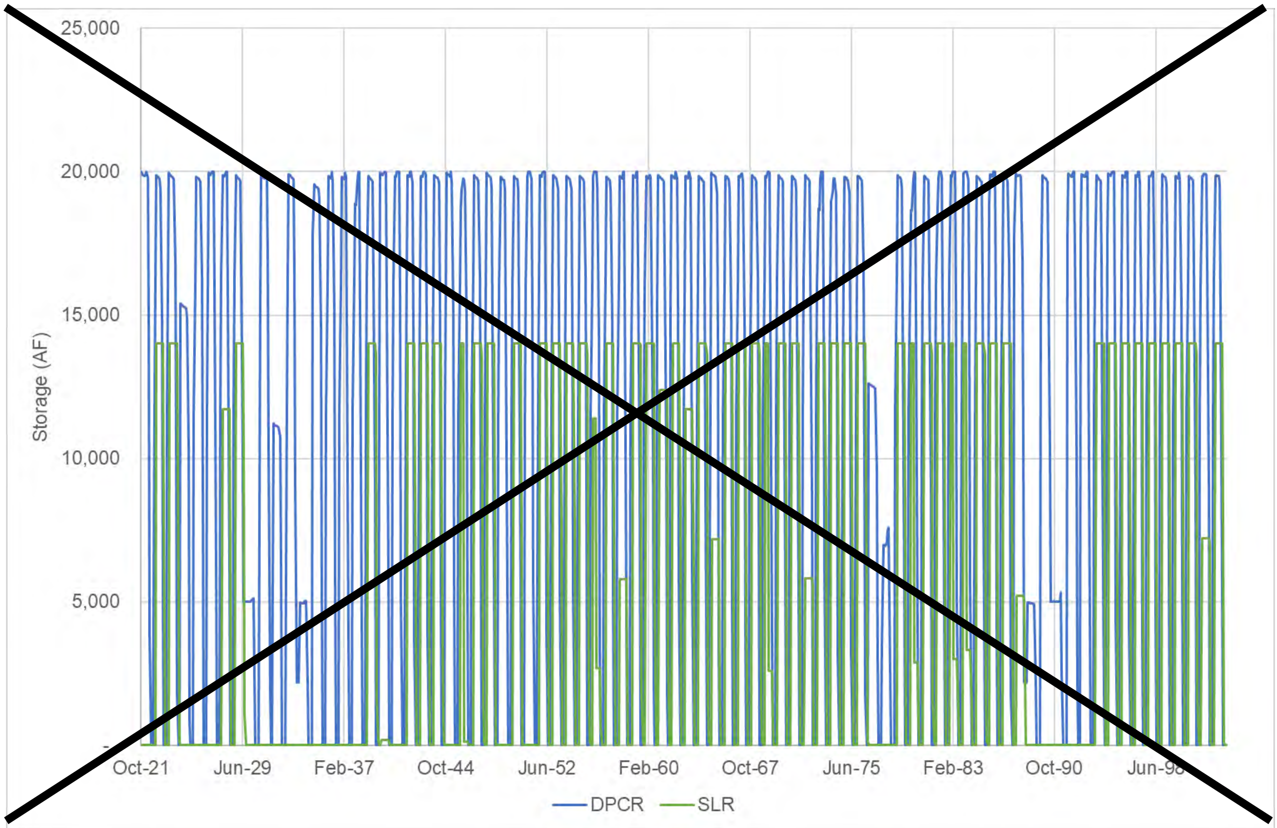


~~**DPWD Average Annual Supply Sources (AFY) by Water Year Type**~~

Year Type (SJR Index)	Total Demand	North Valley Supply	CVP Yield	SLR Yield	DPCR Yield	Unmet Demand*
1 - Wet	87,002	18,200	35,882	2,581	29,442	896
2 - Above Normal	78,002	18,200	27,337	3,458	25,222	3,781
3 - Below Normal	78,002	18,200	24,890	6,323	25,954	2,662
4 - Dry	64,001	18,200	12,440	10,592	19,802	3,070
5 - Critical	59,001	18,200	4,054	2,779	21,112	13,095
Shasta Critical Year	61,668	18,200	3,419	1,082	20,580	18,529
Average	**74,668**	**18,200**	**22,516**	**4,634**	**24,899**	**4,486**

~~*To be met by transfers~~

Figure <u>18</u> ~~13~~: DPWD DPCR ~~and SLR~~ Storage (Oct 1921 - Sept 2003)



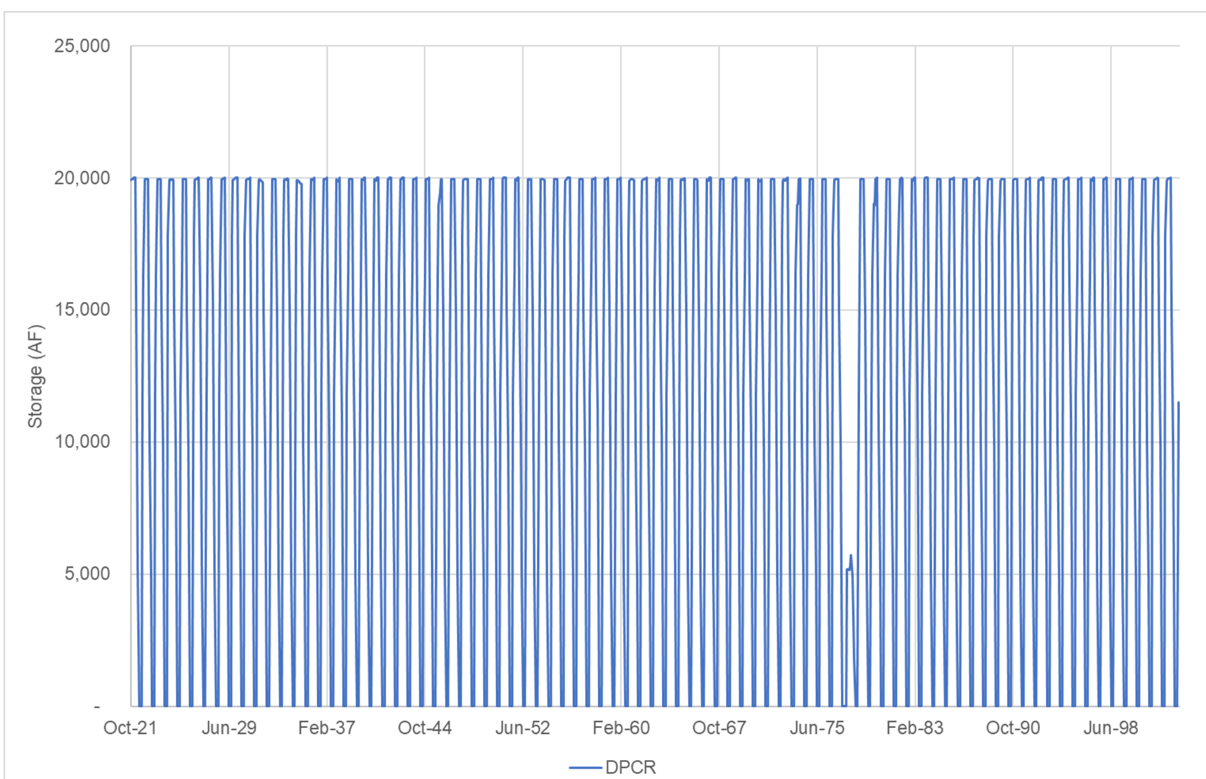


Table 18 ~~15~~: DPWD Average Annual (AFY) DPCR Put and Yield by Water Year Type

Year Type (SJR Index)	DPCR Put (AF)	DPCR Yield (AF)
1 - Wet	20,183	29,442
2 - Above Normal	20,266	25,222
3 - Below Normal	20,311	25,954
4 - Dry	18,876	19,802
5 - Critical	15,032	21,112
Shasta Critical Year	15,271	20,580
Average	**18,991**	**24,890**

Year Type (Sac Index)	DPCR Put	DPCR Yield
1 - Wet	19,170	20,590
2 - Above Normal	18,110	19,120
3 - Below Normal	19,660	19,770
4 - Dry	21,970	19,800
5 - Critical	20,160	19,810
Shasta Critical Year	20,830	19,820
Average	**19,900**	**19,940**

Table 19 ~~16~~: DPWD Average Monthly Yield (AF) by Water Year Type

Year Type (SJR Index)	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1 - Wet	0	0	0	0	0	552	5,180	10,897	[illegible]	11	-	0
2 - Above Normal	0	0	0	0	0	288	4,417	9,522	10,994	1	-	0
3 - Below Normal	0	0	0	0	0	288	4,417	9,522	11,727	0	-	-
4 - Dry	0	0	0	0	0	0	3,229	7,382	9,191	-	-	-
5 - Critical	0	0	0	0	0	0	2,805	[illegible]	6,214	5,476	-	-
Shasta Critical Year	-	0	0	0	0	32	3,031	7,026	5,624	[illegible]	-	-
Average	**0**	**0**	**0**	**0**	**0**	**263**	**4,134**	**9,012**	**10,405**	**1,085**	**-**	**0**

Year Type (Sac Index)	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1 - Wet	-	-	-	-	-	5,000	5,140	5,240	5,220	-	-	-
2 - Above Normal	-	-	-	-	-	4,720	4,800	4,830	4,770	-	-	-
3 - Below Normal	-	-	-	-	-	4,990	4,980	4,950	4,850	-	-	-
4 - Dry	-	-	-	-	-	4,990	4,980	4,960	4,870	-	-	-
5 - Critical	-	-	-	-	-	4,990	4,990	4,960	4,870	-	-	-
Shasta Critical Year	-	-	-	-	-	4,990	4,990	4,970	4,870	-	-	-
Average	**-**	**-**	**-**	**-**	**-**	**4,950**	**5,000**	**5,030**	**4,960**	**-**	**-**	**-**

4.3 Exchange Contractors Operational Results

Figures 19 ~~15~~ and 20 and Tables 20 ~~17~~ through 22 ~~19~~ show the modeled operational results for the Exchange Contractors. For consistency with typical reporting of CVP/SWP operational results, all results are reported using the Sacramento River Index.

Figure 19 ~~14~~ shows the Exchange Contractors' yields for each year from WY 1922 through WY 2003. 40 TAF of transfer yield is achieved in almost every year when it is attempted (years when Shasta Reservoir inflows are greater than 4.0 MAF). Exchange Contractors receives 20 TAF of yield for local water supply in Shasta critical years~~. No yields occur~~, and 20 TAF of yield for transfer partners in the years when inflows are greater than in critical years, but still below 4.0 MAF.

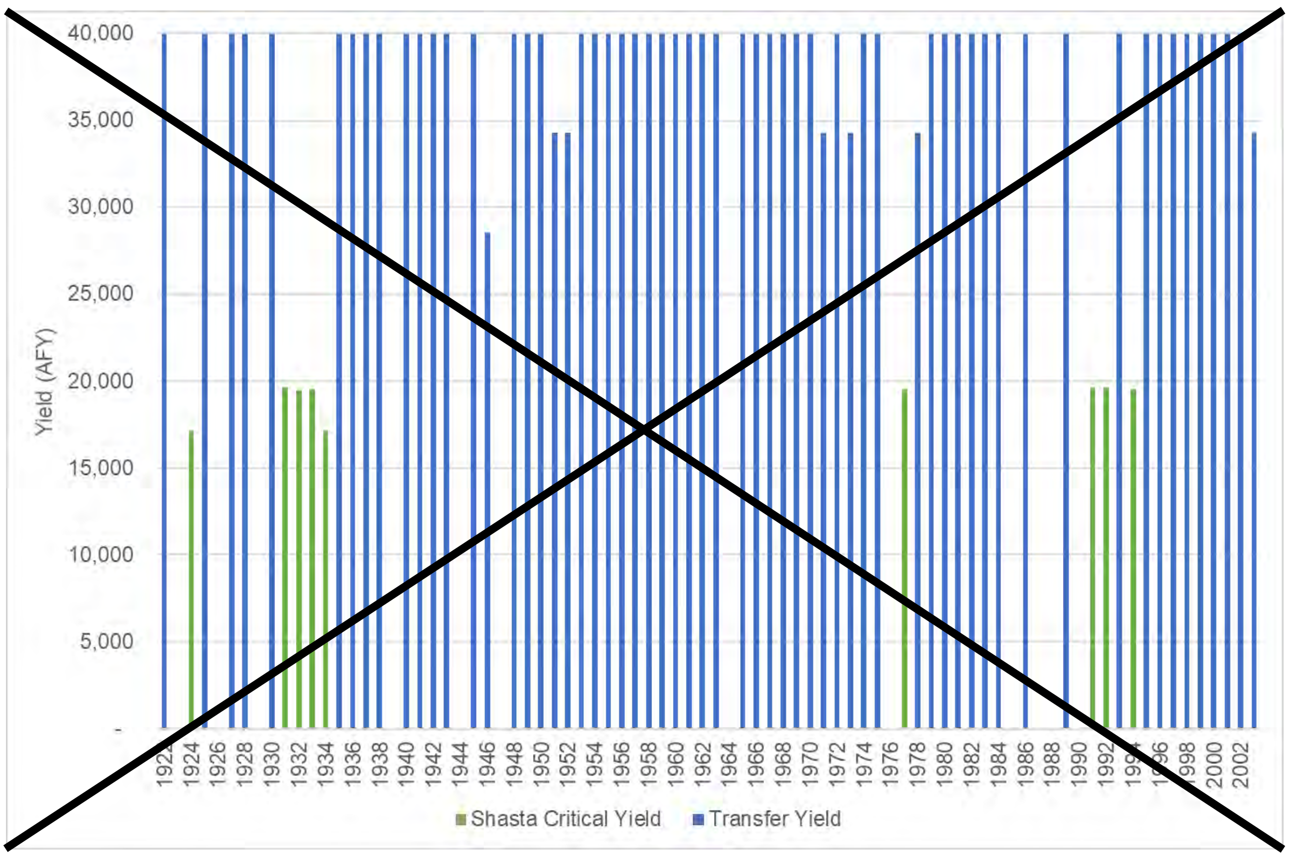
Table 20 ~~17~~ shows the Exchange Contractors' modeled yields by water year type. Yields typically decrease as water year types get drier. Shasta critical years occur mostly in ~~SJR~~ Sacramento River index critically dry years, although ~~they also~~ in one instance a Shasta Critical Year occurs in a ~~SRJ~~ Sacramento River index ~~above~~ below normal ~~and dry~~ years.

Figure 20 ~~15~~ shows modeled storage over time. The Exchange Contractors' storage capacity is fully exercised in most years.

Table 21 ~~18~~ shows the Exchange Contractors' annual average DPCR put and yield by water year type. Puts are fairly consistent between all years that are not critically dry years. Yields are consistent between all years that are not dry or critically dry, when they are about half of the yield in wetter years.

Table 22 ~~19~~ shows the Exchange Contractors' monthly average DPCR yield by water year type. Yields are spread out evenly between March and September, except for in critically dry years, when greater yields occur in April and May due to Shasta critical year take patterns.

Figure 19 ~~14~~: Exchange Contractors Annual Yields (WY1922 - WY2002)



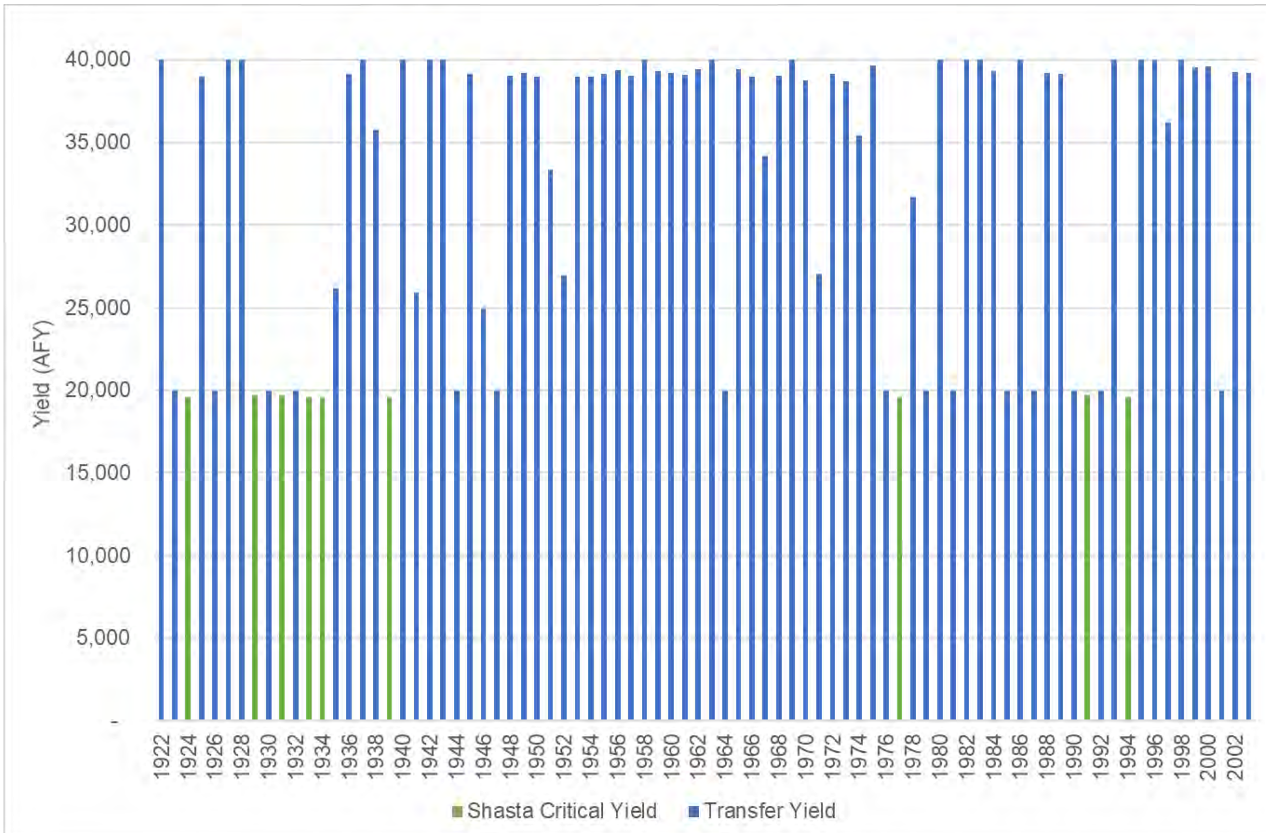
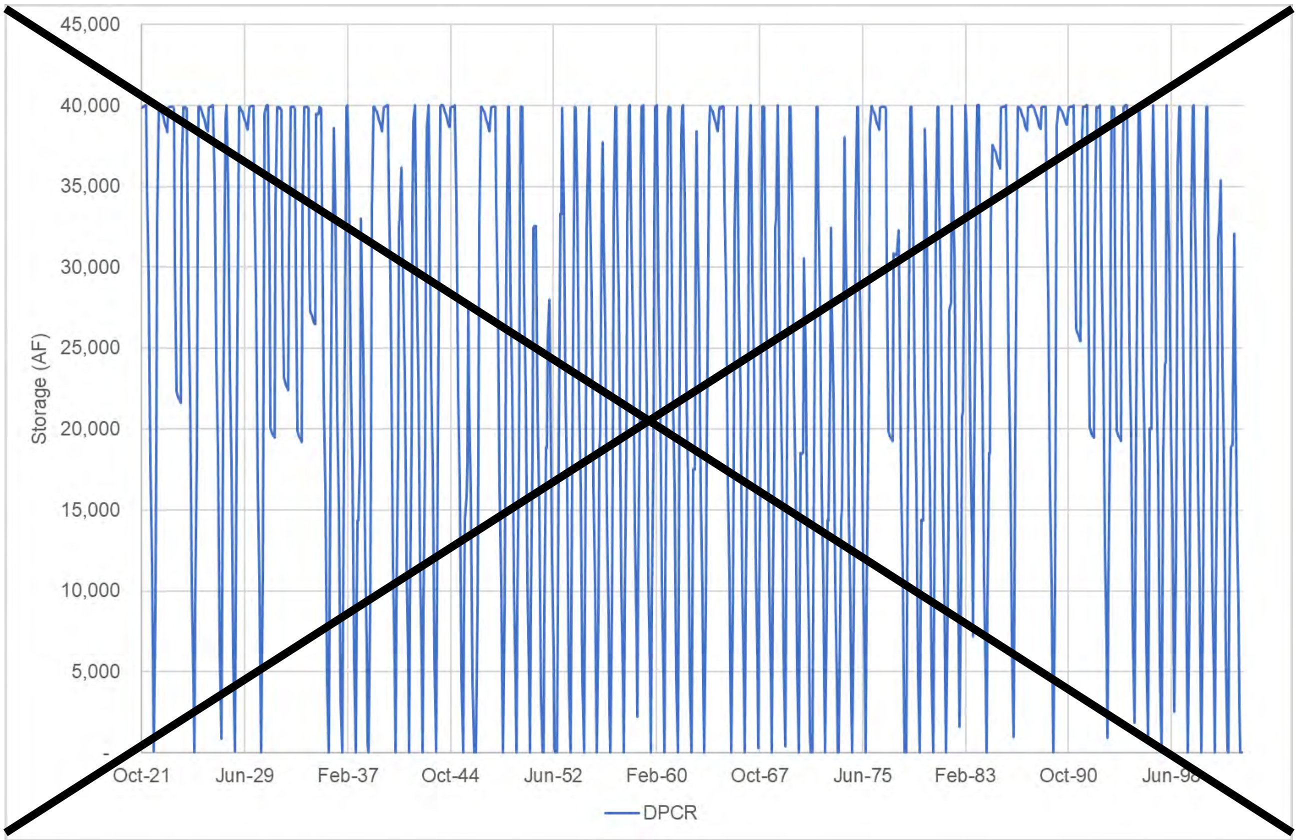


Table 20 ~~17~~: Exchange Contractors Average Annual Yield (AFY) by Year Type

~~Year Type (SJR Index)~~	~~DPCR Total Yield~~	~~DPCR Shasta Critical Yield~~	~~DPCR Transfer Yield~~
~~1 - Wet~~	~~39,509~~	~~-~~	~~19,992~~
~~2 - Above Normal~~	~~34,776~~	~~608~~	~~17,315~~
~~3 - Below Normal~~	~~36,030~~	~~-~~	~~18,455~~
~~4 - Dry~~	~~23,032~~	~~750~~	~~10,765~~
~~5 - Critical~~	~~18,256~~	~~4,279~~	~~4,998~~
~~Shasta Critical Year~~	~~19,018~~	~~9,773~~	~~-~~
~~**Average**~~	~~**31,275**~~	~~**1,073**~~	~~**14,838**~~

Year Type (Sac Index)	DPCR Total Yield	DPCR Shasta Critical Yield	DPCR Transfer Yield
1 - Wet	37,560	-	37,560
2 - Above Normal	37,350	-	37,350
3 - Below Normal	33,900	1,780	32,120
4 - Dry	28,960	-	29,590
5 - Critical	21,340	11,440	8,270
Shasta Critical Year	19,610	17,430	-
Average	**32,560**	**1,910**	**30,560**

Figure <u>20</u> ~~15~~: Exchange Contractors Storage (Oct 1921 - Sept 2003)



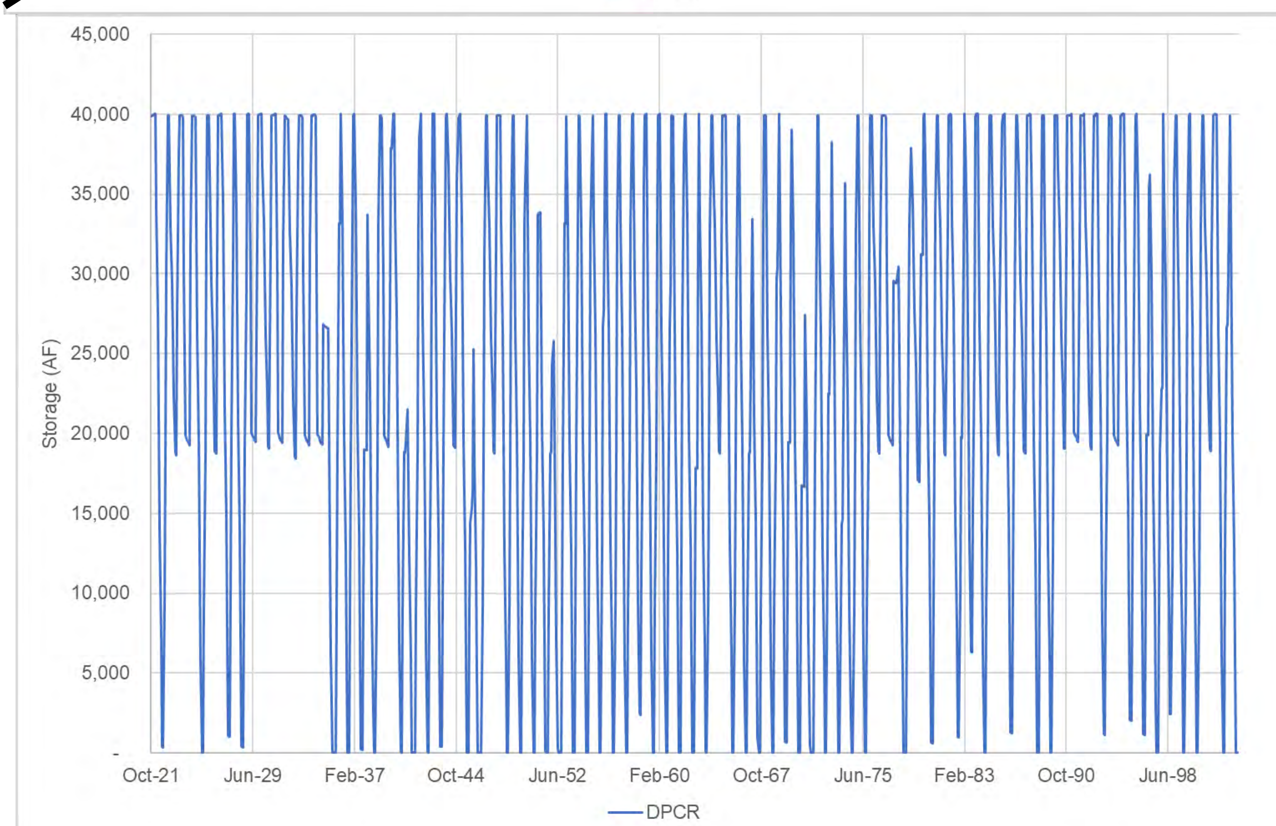


Table 21 ~~18~~: Exchange Contractors Average Annual (AFY) Put and Yield by Year Type

Year Type (SJR Index)	DPCR Put	DPCR Total Yield
~~1 - Wet~~	~~30,819~~	~~39,509~~
~~2 - Above Normal~~	~~27,722~~	~~34,776~~
~~3 - Below Normal~~	~~34,030~~	~~36,030~~
~~4 - Dry~~	~~37,418~~	~~23,032~~
~~5 - Critical~~	~~22,641~~	~~18,256~~
~~Shasta Critical Year~~	~~17,535~~	~~19,018~~
~~Average~~	**~~30,184~~**	**~~31,275~~**

Year Type (Sac Index)	DPCR Put	DPCR Yield
1 - Wet	31,980	37,560
2 - Above Normal	30,130	37,350
3 - Below Normal	36,480	33,900
4 - Dry	35,410	28,960
5 - Critical	25,840	21,340
Shasta Critical Year	27,470	19,610
Average	**32,230**	**32,560**

Table 22 ~~19~~: Exchange Contractors Average Monthly Yield (AF) by Water Year Type

Year Type (SJR Index)	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
~~1 - Wet~~	~~0~~	~~(0)~~	~~0~~	~~(0)~~	~~(0)~~	~~5,716~~	~~5,716~~	~~5,716~~	~~5,716~~	~~5,716~~	~~5,716~~	~~5,240~~
~~2 - Above Normal~~	~~0~~	~~(0)~~	~~0~~	~~(0)~~	~~(0)~~	~~5,001~~	~~5,610~~	~~5,610~~	~~5,001~~	~~5,001~~	~~4,644~~	~~3,930~~
~~3 - Below Normal~~	~~0~~	~~0~~	~~0~~	~~0~~	~~(0)~~	~~5,276~~	~~5,276~~	~~5,276~~	~~5,276~~	~~5,276~~	~~5,276~~	~~4,397~~
~~4 - Dry~~	~~(0)~~	~~-~~	~~0~~	~~0~~	~~(0)~~	~~3,078~~	~~3,829~~	~~3,829~~	~~3,078~~	~~3,078~~	~~3,078~~	~~3,078~~
~~5 - Critical~~	~~(0)~~	~~(0)~~	~~(0)~~	~~(0)~~	~~0~~	~~1,429~~	~~5,711~~	~~5,412~~	~~1,429~~	~~1,429~~	~~1,429~~	~~1,429~~
~~Shasta Critical Year~~	~~(0)~~	~~(0)~~	~~(0)~~	~~0~~	~~0~~	~~0~~	~~9,781~~	~~9,249~~	~~(0)~~	~~-~~	~~(0)~~	~~0~~
~~Average~~	**~~0~~**	**~~(0)~~**	**~~0~~**	**~~0~~**	**~~(0)~~**	**~~4,252~~**	**~~5,326~~**	**~~5,267~~**	**~~4,252~~**	**~~4,252~~**	**~~4,182~~**	**~~3,764~~**

Year Type (Sac Index)	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1 - Wet	-	-	-	-	-	6,670	6,660	6,670	6,630	5,920	5,000	-
2 - Above Normal	-	-	-	-	-	6,670	6,660	6,670	6,530	6,030	4,800	-
3 - Below Normal	-	-	-	-	-	5,450	6,330	6,360	5,450	5,450	4,850	-
4 - Dry	-	-	-	-	-	5,000	5,000	5,000	4,980	4,670	4,320	-
5 - Critical	-	-	-	-	-	1,390	7,820	8,040	1,390	1,390	1,320	-
Shasta Critical	-	-	-	-	-	-	9,650	9,970	-	-	-	-
Average	**-**	**-**	**-**	**-**	**-**	**5,320**	**6,380**	**6,420**	**5,290**	**4,910**	**4,250**	**-**

4.4 Water Transfer Pool Operational Results

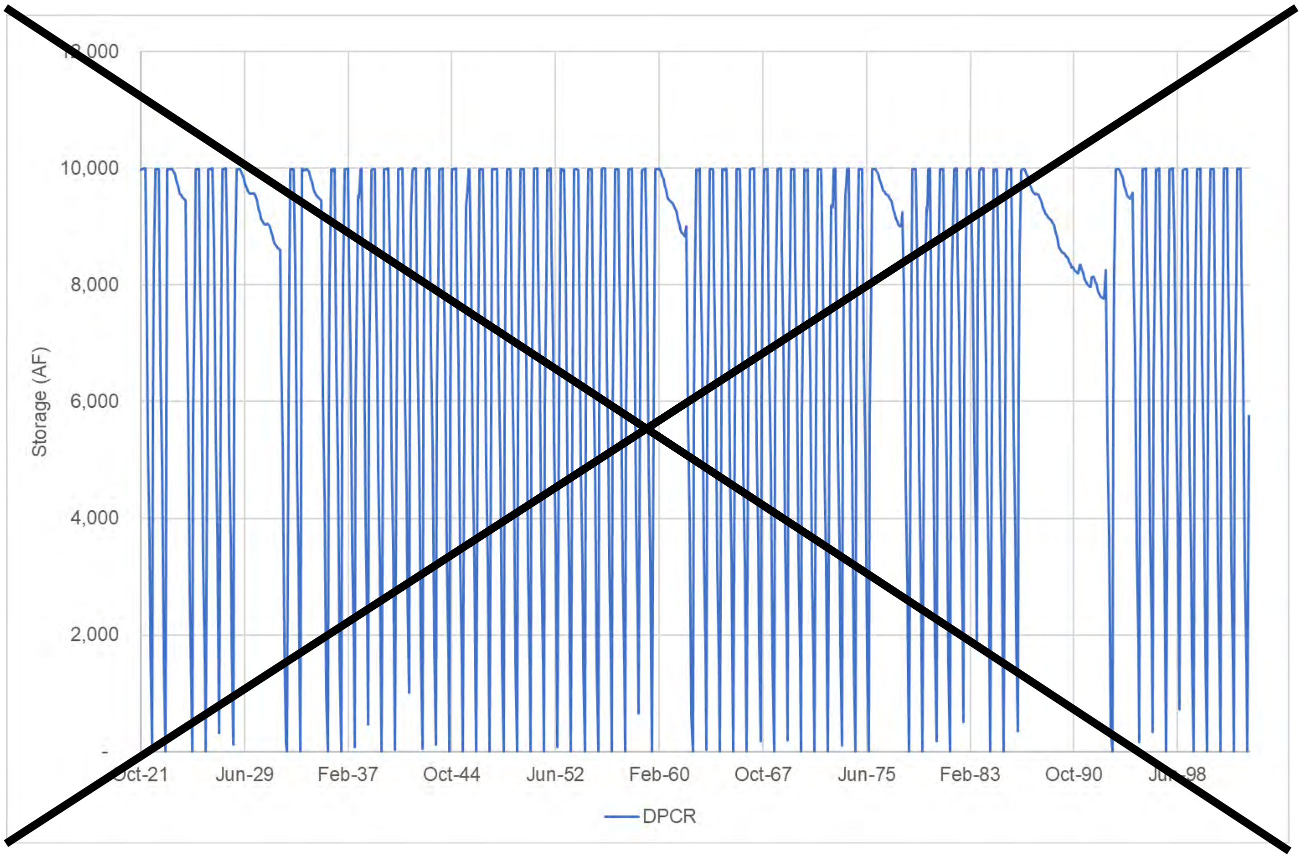
Figure 21 ~~16~~ and Tables 23 ~~20~~ and 24 ~~21~~show the modeled operational results for the water transfer pool. For consistency with typical reporting of CVP/SWP operational results, all results are reported using the Sacramento River Index.

Figure 21 ~~16~~ shows modeled storage over time in DPCR, which is exercised fully in most years. The water transfer storage pool stays full in SJR critically dry years, although water is slowly lost due to seepage and evaporation over extended dry periods.

Table 23 ~~20~~ shows the water transfer pool's annual average DPCR put and yield by water year type. Put and yield are both consistent between years except for critically dry years, when no put or yield occurs.

Table 24 ~~21~~ shows the water transfer pool's monthly average DPCR yield by water year type. Yields occur consistently from March through August.

Figure 21 ~~16~~: Water Transfer DPCR Storage (Oct 1921 - Sept 2003)



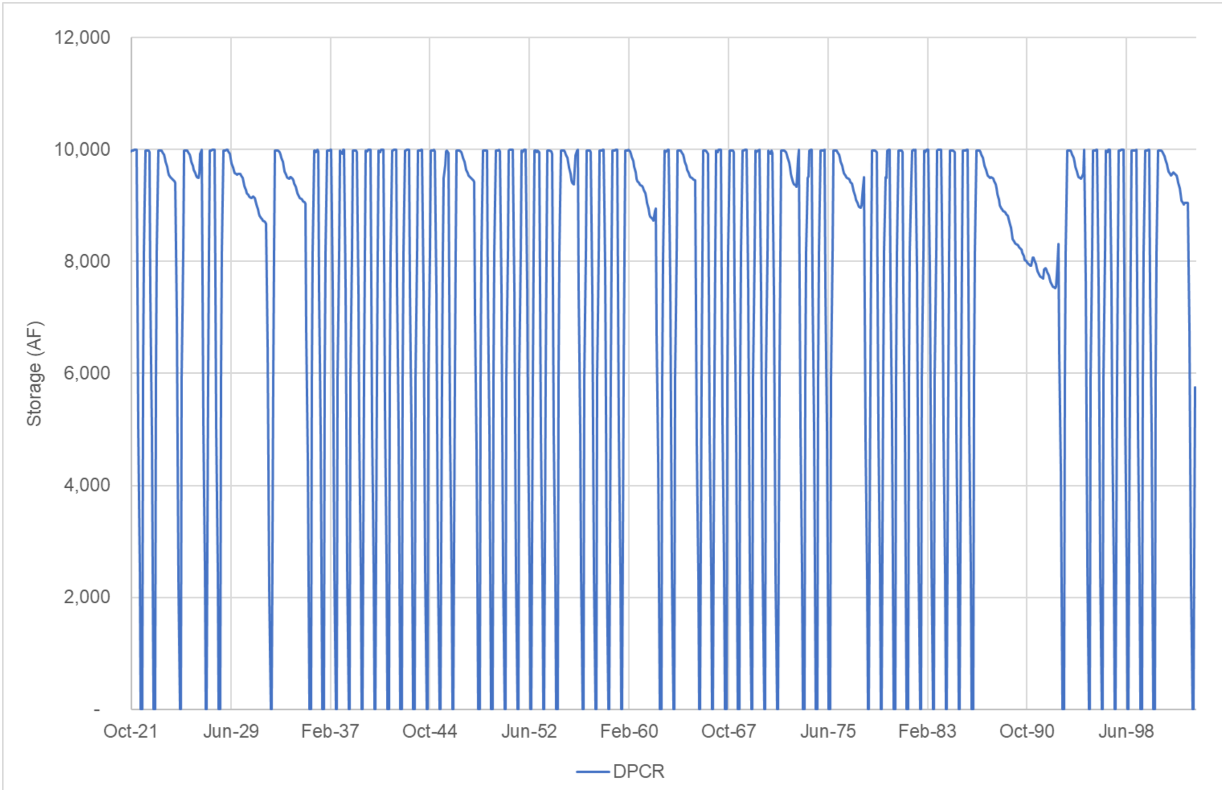


Table 23 ~~20~~: Water Transfer Pool Average Annual (AFY) DPCR Put and Yield by Water Year Type

Year Type (SJR Index)	DPCR Put	DPCR Total Yield
1 - Wet	9,905	9,918
2 - Above Normal	10,212	9,918
3 - Below Normal	10,253	9,918
4 - Dry	10,185	9,918
5 - Critical	-	0
Shasta Critical Year	2,260	2,204
Average	**8,106**	**7,959**

Year Type (Sac Index)	DPCR Put	DPCR Yield
1 - Wet	10,100	9,980
2 - Above Normal	10,100	9,710
3 - Below Normal	9,180	8,780
4 - Dry	4,040	3,860
5 - Critical	840	710
Shasta Critical Year	1,120	1,090
Average	**7,100**	**6,890**

Table 24 ~~21~~: Average Monthly DPCR (AF) Yield for Water Transfers by Water Year Type

Year Type (SJR Index)	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
~~1 - Wet~~	~~(0)~~	~~(0)~~	~~0~~	~~(0)~~	~~(0)~~	~~1,654~~	~~1,654~~	~~1,654~~	~~1,654~~	~~1,654~~	~~1,654~~	~~0~~
~~2 - Above Normal~~	~~(0)~~	~~0~~	~~(0)~~	~~0~~	~~0~~	~~1,654~~	~~1,654~~	~~1,654~~	~~1,654~~	~~1,654~~	~~1,654~~	~~0~~
~~3 - Below Normal~~	~~0~~	~~(0)~~	~~0~~	~~0~~	~~0~~	~~1,654~~	~~1,654~~	~~1,654~~	~~1,654~~	~~1,654~~	~~1,654~~	~~0~~
~~4 - Dry~~	~~(0)~~	~~0~~	~~(0)~~	~~0~~	~~0~~	~~1,654~~	~~1,654~~	~~1,654~~	~~1,654~~	~~1,654~~	~~1,654~~	~~-~~
~~5 - Critical~~	~~(0)~~	~~(0)~~	~~-~~	~~0~~	~~(0)~~	~~0~~	~~0~~	~~0~~	~~0~~	~~(0)~~	~~0~~	~~(0)~~
~~Shasta Critical Year~~	~~(0)~~	~~(0)~~	~~0~~	~~(0)~~	~~(0)~~	~~368~~	~~368~~	~~368~~	~~368~~	~~368~~	~~368~~	~~-~~
~~**Average**~~	~~**(0)**~~	~~**(0)**~~	~~**(0)**~~	~~**0**~~	~~**(0)**~~	~~**1,331**~~	~~**1,331**~~	~~**1,331**~~	~~**1,331**~~	~~**1,331**~~	~~**1,331**~~	~~**0**~~

Year Type (Sac Index)	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1 - Wet	-	-	-	-	-	-	2,490	2,520	2,520	2,440	-	-
2 - Above Normal	-	-	-	-	-	-	2,440	2,440	2,430	2,350	-	-
3 - Below Normal	-	-	-	-	-	-	2,230	2,220	2,200	2,140	-	-
4 - Dry	-	-	-	-	-	-	980	970	970	940	-	-
5 - Critical	-	-	-	-	-	-	180	180	180	170	-	-
Shasta Critical	-	-	-	-	-	-	280	280	270	270	-	-
Average	**-**	**-**	**-**	**-**	**-**	**-**	**1,740**	**1,750**	**1,740**	**1,690**	**-**	**-**

4.5 Refuges Operational Results

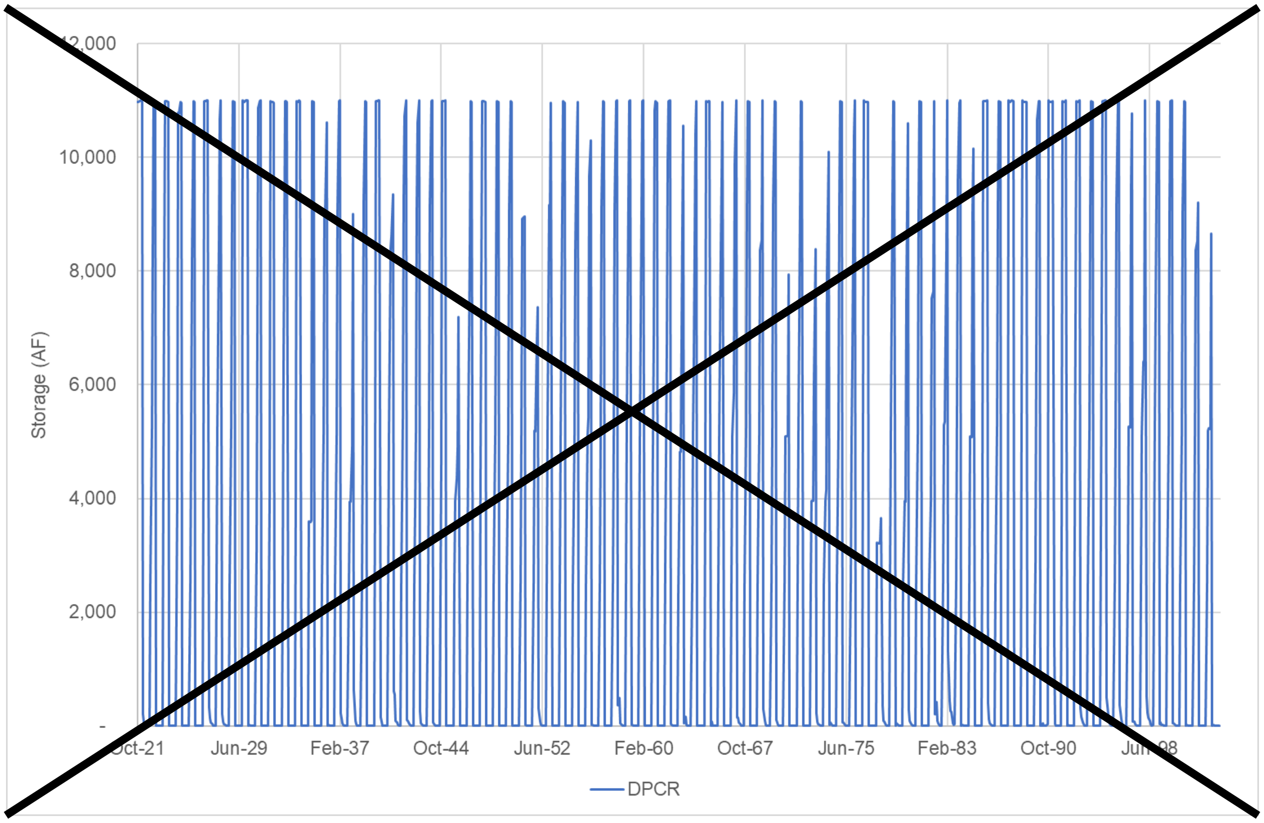
Figure 22 ~~17~~ and Tables 25 ~~22~~ and 26 ~~23~~ show the modeled operational results for the Refuges. For consistency with typical reporting of CVP/SWP operational results, all results are reported using the Sacramento River Index.

Figure 22 ~~17~~ shows the Refuges' modeled storage over time in DPCR. The Refuges exercise their full storage capacity in most years.

Table 25 ~~22~~ shows the Refuges' annual average DPCR put and yield by water year type. Both put and yield are fairly consistent across all water year types.

Table 26 ~~23~~ shows the Refuges' monthly average DPCR yield by water year type. The vast majority of the water released to the refuges occurs in March, although some releases continue through August in the wettest years.

Figure ~~17~~22: Refuges DPCR Storage (Oct 1921 - Sept 2003)



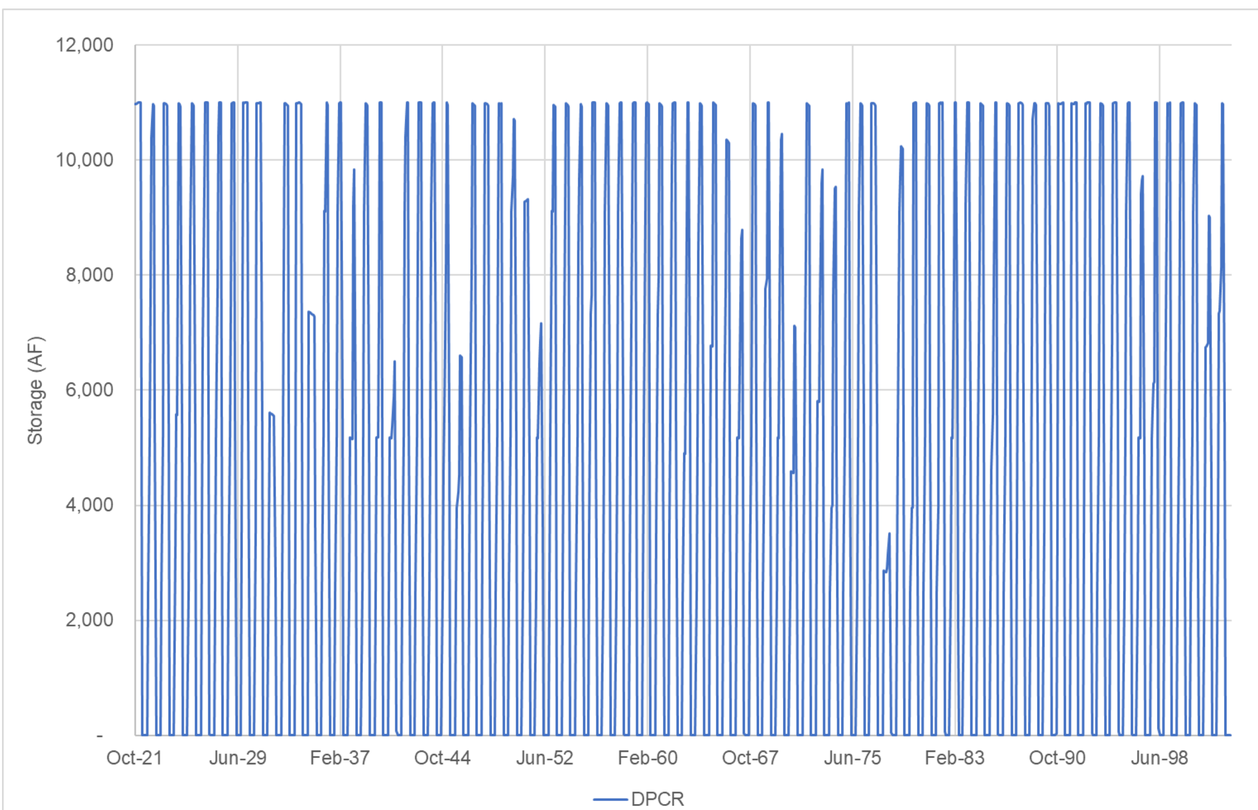


Table 25 ~~22~~: Refuges Average Annual (AFY) Put and Yield by Water Year Type

Year Type (SJR Index)	DPCR Put	DPCR Total Yield
1 - Wet	9,734	10,669
2 - Above Normal	10,437	10,330
3 - Below Normal	10,624	10,405
4 - Dry	10,747	10,580
5 - Critical	10,929	10,875
Shasta Critical Year	10,969	10,939
Average	**10,406**	**10,587**

Year Type (Sac Index)	DPCR Put	DPCR Yield
1 - Wet	9,630	10,380
2 - Above Normal	9,760	9,860
3 - Below Normal	10,980	10,820
4 - Dry	10,690	10,560
5 - Critical	10,580	10,450
Shasta Critical Year	11,030	10,900
Average	**10,230**	**10,410**

Table 26 ~~23~~: Refuges Average Monthly Yield (AF) by Water Year Type

Year Type (SJR Index)	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1 - Wet	0	0	0	0	0	10,108	317	159	56	31	6	0
2 - Above Normal	0	0	0	0	0	10,220	59	40	13	5	0	0
3 - Below Normal	0	0	0	0	0	10,373	23	9	5	2	0	0
4 - Dry	0	0	0	0	0	[illegible]	1	3	0	0	0	0
5 - Critical	0	0	0	0	0	10,785	89	[illegible]	4	1	0	0
Shasta Critical Year	0	0	0	0	0	10,781	157	5	2	0	0	0
Average	**0**	**0**	**0**	**0**	**0**	**10,379**	**125**	**57**	**21**	**11**	**2**	**0**

Year Type (Sac Index)	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1 - Wet	-	-	-	-	-	-	5,110	5,190	90	-	-	-
2 - Above Normal	-	-	-	-	-	-	4,930	4,930	10	-	-	-
3 - Below Normal	-	-	-	-	-	-	5,450	5,380	-	-	-	-
4 - Dry	-	-	-	-	-	-	5,310	5,250	-	-	-	-
5 - Critical	-	-	-	-	-	-	5,260	5,190	-	-	-	-
Shasta Critical Year	-	-	-	-	-	-	5,480	5,410	-	-	-	-
Average	**-**	**-**	**-**	**-**	**-**	**-**	**5,200**	**5,190**	**30**	**-**	**-**	**-**

5. CALSIM 2 SENSITIVITY ANALYSIS

The CalSim 2 output data used in the above analysis is from the Revised No Action Alternative (09/30/2019) version of CalSim 2. An additional Goldsim analysis was performed using the results of the Revised Project Alternative (10/04/2019) version of Calsim 2. Tables 26 and 27 compare average annual DPCR puts and takes by water year type with each version of CalSim 2. Using the Revise Project Alternative version of CalSim 2 results in a reduction in project puts by about 400 AFY and a reduction in project takes (equivalent to the expected change in project benefits) of about 600 AFY. Therefore, it can be concluded that the version of CalSim that is used results in only a minimal change in overall project benefits.

Using the Revised Project Alternative of CalSim 2 also results in some potential conflicts with available DMC capacity, as increased pumping at Jones in April in the Project Alternative relative to the No Action Alternative means that there may be some years when the desired DPCR releases in April would need to be shifted in order to stay within the available capacity in the DMC. The effect of shifting the release from DPCR could be countered by changing offsets in Exchange Contractors deliveries during April. In addition, in all instances where there is a potential capacity conflict in April there is additional unused capacity is available in the DMC during May, June, and subsequently, and therefore the DPCR would still be able to make its desired releases in each year. Therefore, this issue would not result in any change in estimated project benefits.

Table 27: Comparison CalSim 2 Studies on Modeled Results for Total Puts (AFY)

Water Year Type (Sac Index)	**DPCR Project with CalSim 2 Revised No Action Alternative**	**DPCR Project with CalSim 2 Revised Project Alternative**	**% Difference**
1 – Wet	70,200	69,900	-0.4%
2- Above Normal	66,500	66,500	0.0%
3 – Below Normal	75,900	71,300	-6.3%
4 – Dry	73,100	73,600	0.7%
5 – Critical	58,500	59,700	2.0%
Shasta Critical Year	62,300	63,300	1.6%
Average	**69,400**	**69,000**	**-0.6%**

Table 28: Comparison CalSim 2 Studies on Modeled Results for Total Takes (AFY)

Water Year Type (Sac Index)	**DPCR Project with CalSim 2 Revised No Action Alternative**	**DPCR Project with CalSim 2 Revised Project Alternative**	**% Difference**
1 – Wet	78,500	77,400	-1.4%
2- Above Normal	76,000	75,500	-0.7%
3 – Below Normal	73,300	69,800	-4.9%
4 – Dry	62,900	63,200	0.5%
5 – Critical	52,300	54,200	3.6%
Shasta Critical Year	51,400	53,300	3.6%
Average	**69,800**	**69,200**	**-0.9%**

6. PROJECT BENEFITS

6.1.1 Project Partner Water Supply Benefits

The results of the operations analysis were used to quantify water supply benefits for each Project Partner. The average annual values for each of the supply benefit categories shown in Table 29 below. For consistency with CVP/SWP operations, benefits are reported according to the Sacramento River Index. For all water supply benefit recipients it is assumed that all releases from the DPCR represent new water supplies, and no attempt has been made to quantify how the water put into the reservoir would have been used absent the DPCR.

Table 29: Annual Average Water Supply Benefits (AFY) by DPCR Pool and Water Year Type

Water Year Type (Sac Index)	DPWD Deliveries	Shasta Critical Year Delivery to Exchange Contractors	Exchange Contractors Transfer Supply	CVPIA Refuges Supply	Water Transfer Pool Supply
1 – Wet	20,600	0	37,600	10,400	10,000
2- Above Normal	19,100	0	37,300	9,900	9,000
3 – Below Normal	19,800	1,800	32,100	10,800	8,800
4 – Dry	19,800	0	29,000	10,600	3,900
5 – Critical	19,800	13,100	8,300	10,500	700
Average	**19,900**	**2,200**	**30,400**	**10,400**	**6,800**

Note: As described in the Economics Benefits Evaluation TM, water transfer supplies from the Exchange Contractor and Water Transfer pools are assumed to be delivered to agricultural and CVPIA refuges for the purposes of economic analysis. South-of Delta refuges benefit from DPCR excess flows (described in Section 6.1.4 below) are also assumed to be a part of the CVPIA refuges supply for the purposes of economic analysis.

6.1.2 DMC Capacity Constraint Water Supply Benefits

The DMC conveys water south from the CVP's Jones Pumping Plant to the Mendota Pool. Completed in 1951, the canal is located along the west side of the San Joaquin Valley and provides irrigation supplies to the CVP's San Luis Unit. The canal is about 115 miles long, and its initial diversion design capacity in the vicinity of the proposed DPCR was 4,600 cfs.

Historical and ongoing groundwater pumping has caused significant land subsidence in areas adjacent to portions of the DMC. Land subsidence has reduced the freeboard and flow capacity of the DMC. A portion of the DMC near the location of the proposed DPCR has had capacity reduced from 4,600 cfs to about 4,200 cfs due to subsidence-related capacity issues. Recent subsidence surveys in the area indicate that subsidence has affected the DMC from milepost 0 up to at least milepost 115. Located at milepost 37.34, the proposed DPCR conveyance turnout would be located directly in the middle of one of the most affect portions of the DMC. The Recommended Plan could provide a benefit in helping mitigate this DMC capacity constraint by diverting water upstream of the capacity constraint (up to the conveyance capacity of 300 cfs) during periods of high Jones pumping and releasing it back to the DMC downstream of the constraint during periods of lower Jones pumping. As part of the analysis of the DPCR, the project team estimated the capacity available in reservoir conveyance and storage to help alleviate some of the DMC capacity constraint through use of reservoir facilities. An analysis was then performed using CalSim estimates of Jones pumping to determine the months when the CVP operations could benefit from storing water into the DPCR and subsequently releasing water back into the DMC. This analysis was performed as a post-processing exercise using the results of the Goldsim DPCR model simulation, and assumed that only DPCR storage and conveyance space not used by the other partners would be available for the DMC capacity constraint mitigation operations. For consistency with CVP/SWP operations, benefits are reported according to the Sacramento River Index. Table 30 below shows the estimated benefit in terms of the average annual quantities of water saved.

Table 30: DMC Capacity Constraint Benefit (AFY) by Water Year Type

Water Year Type (Sac Index)	DMC Capacity Constraint Benefit
1 – Wet	23,500
2- Above Normal	15,300
3 – Below Normal	16,000
4 – Dry	10,100
5 – Critical	600
Average	**14,600**

6.1.3 Increased Patterson Water Supply Benefit

As part of the DPCR, the project would pass through Del Puerto Creek flows for M&I use by the City of Patterson. The Project operations were modeled assuming releases of natural Del Puerto Creek flows up to 1,700 AFY in wet, above normal and below normal years and releases of up to 1,275 AFY in dry and critical years (based on the San Joaquin River Index). If the total natural flow in a given year is less than these amounts, then the release to Patterson are limited to the available natural flow. Table 31 below summarizes reservoir releases for use by the City of Patterson. For consistency with CVP/SWP operations, benefits are reported according to the Sacramento River Index.

Table 31: Patterson Water Supply Benefit (AFY) by Water Year Type

Water Year Type (Sac Index)	Patterson Water Supply Benefit
1 – Wet	1,700
2- Above Normal	1,400
3 – Below Normal	800
4 – Dry	600
5 – Critical	200
Average	**1,000**

6.1.4 South-of Delta Refuges Benefit from DPCR Excess Flows

The Excess Flows or “spills” described in Section 4 above are flows from the Del Puerto Creek that occur during wet years from December through March that cannot be stored in the reservoir, but could be diverted and transferred downstream for beneficial use. Based on recent input from Reclamation that refuge water is needed during those, these flows are accounted for in the tabulation for CVP south of delta refuge water. The average benefit per water year type is shown in Table 32 below. Note that it is assumed that the water right considerations would limit the total take from the DPC to 17,000 AFY, and excess flows that fall within this limit are counted as a project benefit. For the purposes of the economic analysis, these flows are combined with the CVPIA refuges supply from the refuges pool in Table 29 above.

Table 32: Excess Flows Supply Benefit (AFY) by Water Year Type

Water Year Type (Sac Index)	Excess Flows Supply Benefit
1 – Wet	1,500
2- Above Normal	1,500
3 – Below Normal	500
4 – Dry	100
5 – Critical	200
Average	**800**

7. REFERENCES

California Natural Resources Agency, Department of Water Resources (DWR), 2018. *SGMA Data Viewer*. https://data.cnra.ca.gov/showcase/sgma-data-viewer

California Water Commission, 2016. *Water Storage Investment Program Technical Reference*. November 2016.

RMC (Woodard & Curran), 2018. *City of Patterson Water Master Plan Final Report*. March 2018.

APPENDIX G: **Transportation Impact Assessment**

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November 2019

Transportation Impact Assessment

Del Puerto Canyon Reservoir

Prepared for:
Del Puerto Water District
Woodard & Curran

Del Puerto Canyon Reservoir TIA

Prepared for:
Del Puerto Water District, Woodard & Curran

November 2019

WC19-3603

FEHR & PEERS

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Chapter 1 – Introduction

A Transportation Impact Assessment (TIA) was conducted for the proposed Del Puerto Canyon Reservoir (Project) in Stanislaus County, California.

The proposed project is to construct a reservoir located on Del Puerto Creek in the foothills of the Coast Range Mountains, west of Patterson, California and Interstate 5. A project site vicinity map is presented in **Figure 1**. The reservoir project would include the construction of a main dam, four (4) saddle dams, a spillway, inlet/outlet works, conveyance facilities, and electrical facilities. The project also includes a relocation of the county maintained Del Puerto Canyon Road, as part of the existing alignment will be submerged by the proposed reservoir.

This study addresses the Project's traffic impacts on the roadway system under Existing, Near-Term, and Cumulative scenarios, and discusses the potential impacts to the adjacent bicycle, pedestrian, and transit network.

Report Organization

This report is organized into eight chapters as described below:

- ***Chapter 1 – Introduction*** describes the study area, the analysis scenarios, the analysis methodology, and significance criteria.
- ***Chapter 2 – Existing Conditions*** describes the transportation system within the study area, including the surrounding roadway network, existing bicycle, pedestrian, and transit facilities, and intersection operations.
- ***Chapter 3 – Project Characteristics*** describes the traffic effects of the three components of the project: the construction of the realignment of Del Puerto Canyon Road, the construction of the Del Puerto Canyon Dam and associated infrastructure, and the post-construction re-routed traffic volumes.
- ***Chapter 4 -Existing with Project Traffic Conditions*** discusses traffic impacts associated with the completion of the roadway realignment (two alternatives) and Del Puerto Canyon Dam, relative to existing conditions.
- ***Chapter 5 – Near-Term Conditions*** discusses conditions during the construction of the project (2022 – 2027), including the roadway realignment, dam, and dam support infrastructure.
- ***Chapter 6 – Cumulative (2040) Conditions*** describes traffic impacts associated with post-construction conditions, with completion of the roadway realignment and Del Puerto Canyon Dam, relative to Cumulative (2040) No Project conditions.

Existing Intersection | Potential Future Intersection | Roadway Realignment Alternative 1 | Roadway Realignment Alternative 2 | Inundation and Dam Area

Figure 1

Project Site Vicinity

WC19-3603_1_StudyArea

Study Area

The study intersections in this assessment were selected based on a review of the project location and the potential changes in traffic volumes with the Project in the greater area. Study intersections were also chosen with consideration as to how potential realignment alternatives of Del Puerto Canyon Road might affect intersection operations.

Study Intersections

The impact analysis is based on isolated intersection analysis for the following intersections:

1. Diablo Grande Parkway/Sperry Avenue and Interstate 5 Northbound On/Off-Ramps
2. Diablo Grande Parkway/Sperry Avenue and Interstate 5 Southbound On/Off-Ramps
3. Del Puerto Canyon Road & Diablo Grande Parkway
4. Diablo Grande Parkway & Roadway Realignment Option 1 (future intersection)
5. Diablo Grande Parkway & Roadway Realignment Option 2 (future intersection)

Analysis Scenarios

The traffic impacts are analyzed for the following scenarios:

- Existing (2019) Conditions
- Existing (2019) with Project Conditions (new reservoir and realigned roadway)
- Near-Term (2022 – 2027) Conditions during construction of the project
- Cumulative (2040) Conditions with new reservoir and realigned roadway

Typical weekday morning and evening peak hour conditions reflecting the peak hour during the periods of 7:00 – 9:00 AM and 4:00 – 6:00 PM, respectively, were analyzed. This is when the roadway network experiences the highest vehicle traffic volumes.

Analysis Methodology

Intersection Operations

The traffic operations analysis uses the Synchro 10.0 software, based on the procedures outlined in the Transportation Research Board's *2010 Highway Capacity Manual* (2010 HCM). Intersection operation inputs include vehicle and pedestrian volumes, lane geometry, signal phasing and timing, pedestrian crossing times, and peak hour factors. Intersection operations are described using the term "Level of

Service" (LOS), a quantitative measure of the average delay experienced by a driver at the intersection. LOS ranges from LOS A, with no congestion and little delay, to LOS F, with excessive congestion and delay. **Table 1** provides ranges of delay and volume-to-capacity ratios that correspond to vehicular LOS at intersections.

Table 1: Level of Service Definitions – Intersections

Level of Service	Signalized Intersections		Unsignalized Intersections	
	Delay (seconds/vehicle)	Volume-to-Capacity Ratio (V/C)	Delay (seconds/vehicle)	Volume-to-Capacity Ratio (V/C)
A	< 10.0	< 1.0	< 10.0	< 1.0
B	> 10.0 to 20.0	< 1.0	> 10.0 to 15.0	< 1.0
C	> 20.0 to 35.0	< 1.0	> 15.0 to 25.0	< 1.0
D	> 35.0 to 55.0	< 1.0	> 25.0 to 35.0	< 1.0
E	> 55.0 to 80.0	< 1.0	> 35.0 to 50.0	< 1.0
F	> 80.0	> 1.0	> 50.0	> 1.0

Source: 2010 *Highway Capacity Manual.*

Traffic Signal Warrants

Unsignalized study intersections operating below acceptable standards during peak hours (see significance criteria for details) were studied to determine whether installation of a traffic control signal is justified. Unsignalized study intersections were evaluated under the Peak Hour Signal Warrant 3 criteria outlined in the 2014 *California Manual on Uniform Traffic Control Devices*.

Vehicle Miles Traveled

In response to Senate Bill 743 (SB 743), the Office of Planning and Research (OPR) updated the California Environmental Quality Act (CEQA) guidelines to include new transportation-related evaluation metrics. Draft guidelines were developed in August 2014, with updated draft guidelines prepared January 2016, which incorporated public comments from the August 2014 guidelines. OPR released final proposed Guidelines on November 27, 2017. The final proposed Guidelines include a new Section 15064.3 describing vehicle miles of travel (VMT) analysis as the most appropriate measure of transportation impacts, and providing recommendations on criteria for analyzing transportation impacts of land use and transportation projects. OPR also released a Technical Advisory on Evaluating Transportation Impacts in CEQA. The final amended Guidelines and Technical Advisory were released in December 2018 and full compliance with the amended Guidelines is required by July 2020.

For purposes of transportation analysis, the Del Puerto Canyon Reservoir project is chiefly a transportation project, given the roadway realignment component of the project. The *2018 CEQA Guidelines,* as amended, provides the potential basis for the evaluation of vehicle miles of travel generated by a transportation project as described below.

> <u>Text of Amendments to CEQA Guidelines Appendix G</u>
>
> *b) For a land use project, would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)(1)?*
>
> (b) Criteria for Analyzing Transportation Impacts.
>
> (2) Transportation Projects. Transportation projects that reduce, or have no impact on, vehicle miles traveled should be presumed to cause a less than significant transportation impact. For roadway capacity projects, agencies have discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements. To the extent that such impacts have already been adequately addressed at a programmatic level, such as in a regional transportation plan EIR, a lead agency may tier from that analysis as provided ion Section 15152.

Neither the Del Puerto Water District nor Stanislaus County have established standards or thresholds for VMT generation and impact evaluation. Therefore, the VMT analysis presented in this report is provided for information only, and is not used as the basis for impact evaluation.

Significance Criteria

This section describes the thresholds of significances used to determine Project-related traffic impacts. Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.) provides the guidance for determining the significance of potential transportation and traffic impacts. These guidelines are presented below, along with the specific criteria used in this EIR based on the standards of Stanislaus County (for intersections 3 through 5, which are on County roadways) and Caltrans (for intersections 1 and 2, which are owned and operated by Caltrans).

Impacts to transportation and traffic would be significant if the proposed project would:

1. Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, 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.

For the purposes of this impact evaluation, an impact would be significant if:

i. Project traffic at a Stanislaus County intersection (intersections 3, 4 and 5) would result in intersection operations below the Stanislaus County acceptable thresholds:

   A. For an intersection in Stanislaus County, the project would cause the LOS to degrade to LOS D or worse; or

   B. For an intersection that already operates at LOS D, the project adds traffic to the intersection.

ii. Project traffic at a Caltrans owned and operated intersection (intersections 1 and 2) would result in intersection operations below the Caltrans acceptable thresholds:

   A. If a Caltrans facility is projected to operate at LOS D or better without project and the project is expected to cause the facility to operate at LOS E or worse, the impact may be considered significant.

   B. If a Caltrans facility is projected to operate at LOS E or F without project and the project is expected to increase delay, the impact may be considered significant.

It is noted that Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on State Highway facilities (Guide for the Preparation of Traffic Studies, Caltrans, December 2002); however, Caltrans recognizes that achieving LOS C/LOS D may not always be feasible.

2. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).

   For the purposes of this impact evaluation, an impact would be significant if the project design does not provide adequate sight distance and does not conform to Stanislaus County and Caltrans roadway design standards.

3. Result in inadequate emergency access.

   For the purposes of this impact evaluation, an impact would be significant if the Project design impedes emergency access within the study area.

4. Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

   For the purposes of this impact evaluation, an impact would be significant it the Project prevents planned transit, pedestrian, or bicycle improvements from being constructed.

Chapter 2 – Existing (2019) Conditions

This chapter describes the existing transportation conditions in the study area including the roadway network and transit, pedestrian, and bicycle facilities in the vicinity of the project site.

Roadway System

Interstate 5 is a freeway serving the western US from the southern border with Mexico to the northern border with Canada. In the study area, I-5 provides two lanes in each direction, and a diamond interchange with Sperry Avenue/Diablo Grande Parkway provides access to the City of Patterson to the east and the Diablo Grande community to the west. Average daily traffic (ADT) within the project vicinity is 51,500 vehicles.[1]

Del Puerto Canyon Road is a two-lane rural roadway connecting I-5 in the east to Mines Road/San Antonio Valley Road in the west. The roadway has paved shoulders between the I-5 southbound ramps intersection and the intersection with Diablo Grande Parkway; north of Diablo Grande Parkway, the roadway has soft shoulders. No bicycle lanes or sidewalk facilities are provided. The posted speed in the study area is 35 mph.

Diablo Grande Parkway is a two-lane rural roadway connecting Del Puerto Canyon Road in the east to the Diablo Grande community. The roadway has paved shoulders, which are marked as bicycle lanes in the vicinity of the Diablo Grande community. No sidewalks are provided. The posted speed limit in the area is 40 mph.

Mt. Oso Road is a gated private roadway that intersects Del Puerto Canyon Road to the east of the proposed roadway realignment alternatives. The roadway is approximately 13 feet wide, with soft shoulders.

Bicycle Facilities

Bicycle facilities are typically classified into three categories as described below:

- **Bicycle paths (Class I)** provide a completely separate right-of-way and are designated for the exclusive use bicycles and pedestrians with vehicle cross-flow minimized.

[1] Caltrans Performance Measurement System, August 2018; average of last twelve available months.

- **Bicycle lanes (Class II)** provide a restricted right-of-way and are designated for the use of bicycles for one-way travel with a striped lane on a street or highway. Bicycle lanes are generally a minimum of five feet wide. Vehicle parking and vehicle/pedestrian cross-flow are permitted.

- **Bicycle routes (Class III)** provide right-of-way designated by signs or pavement markings for shared use with motor vehicles. These include sharrows or "shared-lane markings" to highlight the presence of bicyclists.

- **Class IV Bikeways (Class IV)** cycle tracks or "separated" bikeways provide a right-of-way designated exclusively for bicycle travel within a roadway and are protected from other vehicle traffic by physical barriers, including, but not limited to, grade separation, flexible posts, inflexible vertical barriers such as raised curbs, or parked cars.

Within the study area, Del Puerto Canyon Road has Class III "Share the Road" bicycle route signage to indicate the presence of bicyclists. Class II bicycle lanes are provided along Diablo Grande Parkway within and near the community of Diablo Grande. There are no planned bicycle facilities within the study area.

Pedestrian Facilities

Pedestrian facilities include sidewalks, pathways, crosswalks, and pedestrian signals. The roadways in the study area are rural two-lane roadways, and no sidewalks or adjacent paths are provided. Crosswalks are not present at the three existing study intersections, which are side-street stop controlled.

Transit Services

There is no transit service provided in the project area. The nearest stop served by transit is just east of the Interstate 5 and Diablo Grande Parkway interchange, on Rogers Road in Patterson. Stanislaus Regional Transit (SRT) provides bus service to this stop via the 45W line, which connects Patterson to the communities of Gustine, Newman and Crows Landing to the south. This service operates Monday through Friday between 5:37 AM and 9:21 PM, providing nine round trips, and on Saturdays between 6:20 AM and 7:56 PM, providing five round trips.

Traffic Counts

Weekday AM and PM peak period counts of vehicles, bicycles and pedestrians were conducted in May 2019 at the three existing study intersections. **Figure 2** presents the existing AM and PM peak hour traffic volumes at the three existing study intersections. No pedestrian nor bicycle activity was observed during the counts. The count data is included in the Technical Appendix.

In addition, 72-hour counts (Tuesday through Thursday) were collected in mid-May on Del Puerto Canyon Road north of Diablo Grande Parkway and Diablo Grande Parkway west of Del Puerto Canyon Road. The average daily volumes on these segments were as follows:

Del Puerto Canyon Road north of Diablo Grande Parkway: 277 vehicles per day

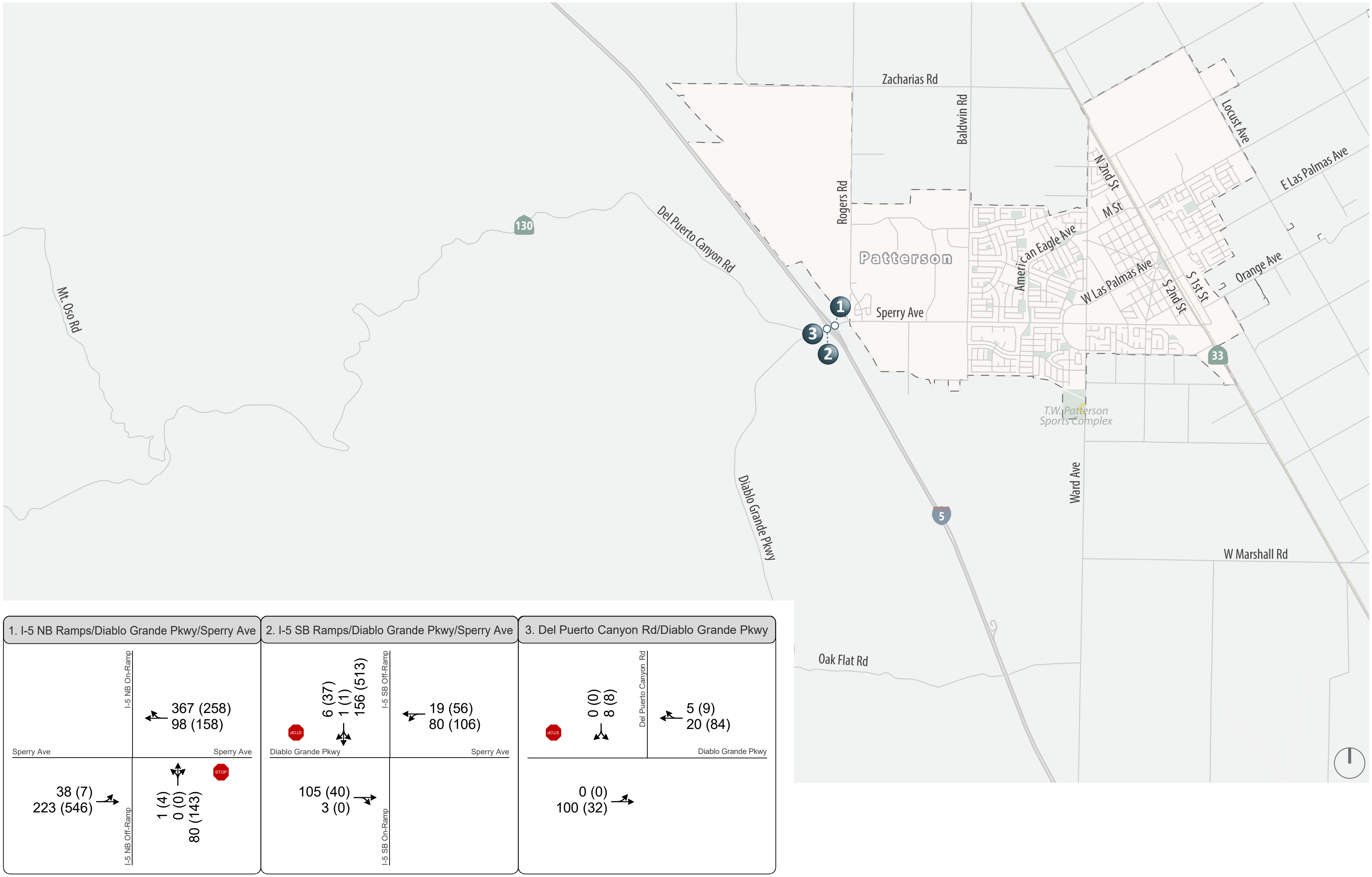
Diablo Grande Parkway west of Del Puerto Canyon Road: 1,623 vehicles per day

Collision Data

Available collision records for Del Puerto Canyon Road and Diablo Grande Parkway were compiled from the University of California, Berkeley's Transportation Injury Mapping System (TIMS). TIMS provides access to injury-related crash data through the California Statewide Integrated Traffic Records System (SWITRS). Collision records were taken from 2011 to 2015, as this represents the last five years of complete data available. Data for 2016 through 2018 is considered provisional and is subject to change.

There are five reported collisions within the project study area. Four of these collisions involved a motor vehicle colliding with a fixed object due to either travel at an unsafe speed, or improper turning movement. The fifth involved a cyclist that sustained an injury due to unsafe speed. In all cases, only one party was involved. The five collision severities include one complaint of pain, three visible injuries, and one severe injury. No fatalities were reported in the study area.

These types of collisions are not uncharacteristic given the study area's rural setting. Preventative best practices commonly employed in such settings include curve warning signage and edgeline rumble strips, and may warrant consideration during the design of the Del Puerto Canyon Road realignment.



XX (YY) AM (PM) Peak Hour Traffic Volumes STOP Stop Sign # Study Intersection

Figure 2

Existing Conditions Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Controls

WC19-3603_2_Vols-Existing

Intersection Operations

Table 2 presents the existing peak hour levels of service at the existing study intersections. Currently, the intersections operate within the applicable LOS standard for the intersections as a whole, but the southbound stop-controlled approach at Diablo Grande Parkway/Sperry Avenue/I-5 Southbound Ramps operates at LOS E (40.9 seconds of delay) in the PM peak hour. The poor LOS results from the relatively high left turn volume, 513 vehicles, which must wait for gaps in the traffic flow along Diablo Grande Parkway/Sperry Avenue.

The LOS calculation worksheets are included in the Technical Appendix.

Table 2: Existing Intersection Levels of Service

ID	Intersection	Control Type	Peak Hour	Existing	
				Delay[1]	LOS
1	Diablo Grande Parkway/Sperry Avenue/I-5 Northbound Ramps	Side-Street Stop	AM PM	1.4 (10.2) 2.0 (15.0)	A (B) A (C)
2	Diablo Grande Parkway/Sperry Avenue/I-5 Southbound Ramps	Side-Street Stop	AM PM	7.3 (12.7) 31.0 (40.9)	A (B) D **(E)**
3	Del Puerto Canyon Road/Diablo Grande Road	Side-Street Stop	AM PM	0.6 (9.2) 0.6 (9.2)	A (A) A (A)

Notes: **Bold text** indicates intersection operates at unacceptable level of service.
1. Whole intersection weighted average control delay expressed in seconds per vehicle calculated using methods described in the 2010 *Highway Capacity Manual*. For side-street stop-controlled intersections, the whole intersection weighted average control delay is reported with the control delay for the worst movement reported in parenthesis.
Source: Fehr & Peers, 2019.

Signal Warrant Analysis

Unsignalized study intersections operating below acceptable standards during peak hours were studied to determine whether installation of a traffic control signal is justified. Unsignalized study intersections were evaluated under the Peak Hour Signal Warrant 3 criteria outlined in the 2014 *California Manual on Uniform Traffic Control Devices*. The intersection of Diablo Grande Parkway/Sperry Avenue/I-5 Southbound Ramps operates at an overall LOS D in the PM peak hour, which is acceptable; however, the stop-controlled southbound approach operates at LOS E due to the high volume of left turns (513 vehicles). This high volume causes the intersection to meet the peak hour signal warrant in the PM peak hour under existing conditions. While the intersection of Diablo Grande Parkway/Sperry Avenue/I-5

Northbound Ramps operates acceptably at an overall LOS A in the PM peak hour, the stop-controlled northbound approach operates at LOS C due to a high volume of right turns (143 vehicles). Combined with the high major street volume on Diablo Grande Parkway/Sperry Avenue in the PM peak hour (969 vehicles total in both directions), the intersection meets the peak hour signal warrant in the PM peak hour.

The signal warrant worksheets are included in the Technical Appendix.

Chapter 3 – Project Characteristics

The project consists of two primary elements: the construction of a realignment for Del Puerto Canyon Road, and the construction of the dam and supporting infrastructure to serve the Del Puerto Canyon Reservoir. These elements are described below. The traffic impacts associated with the construction of the realigned roadway and dam are analyzed in the Near-Term scenario (Chapter 5) while the post-construction traffic impacts of the realigned roadway are analyzed in the Existing With Project scenario (Chapter 4) and the Cumulative scenario (Chapter 6).

Roadway Realignment

Realignment Alternatives

The two roadway realignment alternatives (shown in Figure 1) would be constructed over a period of about 30 months, from February 2022 to June 2024. Roadway Realignment Alternative 1 would be approximately 24,500 feet long and connect to Diablo Grande Parkway at a location about 8,400 feet west of the current Del Puerto Canyon Road intersection. Roadway Realignment Alternative 2 would be approximately 23,500 feet long and connect to Diablo Grande Parkway at a location about 13,200 feet west of the current Del Puerto Canyon Road intersection. The total distance for trips currently using Del Puerto Canyon Road between the Diablo Grande Parkway intersection and points to the east of the study area would increase by 0.44 miles for Roadway Realignment Alternative 1 and by 1.25 miles for Roadway Realignment Alternative 2.

Construction Plan

The construction vehicle estimates and schedule description for the Roadway Realignment project are provided in the Technical Appendix. The information has been prepared for Realignment Alternative 1; for the purposes of this assessment, the schedule and construction traffic is considered similar for Realignment Alternative 2. Based on this information, the following traffic would be generated during roadway construction:

- Construction workers: 20 round trips to the worksite per day (650 days total)[2]
- Dump trucks: 8 trucks in use per day (100 days total)
- Concrete trucks: 10 trucks in use per day (30 days total)

The total number of truck round trips to the site per day is not known at this time.

[2] This assumes no carpooling. Carpooling would reduce the vehicle round trips.

Based on the available information, a peak-traffic day might include the following commute peak hour traffic:

- AM peak hour: 20 inbound worker trips, 8 inbound dump truck trips, and 10 inbound concrete truck trips (38 trip total)
- PM peak hour: 20 outbound worker trips, 8 outbound dump truck trips, and 10 outbound concrete truck trips (38 trips total)

The actual peak hour traffic on any given day may be higher or lower, depending on the schedule for the hauling and concrete work.

For purposes of the intersection LOS evaluation, all construction trucks and worker vehicles were assumed to access the realignment project via the I-5/Diablo Grande Parkway/Sperry Avenue interchange, proceeding on Diablo Grande Parkway toward the west – i.e., toward the southern end of the realignment project. It is noted some traffic may in actuality use Del Puerto Canyon Road to access the northern portion of the realignment project at certain construction stages.

Del Puerto Canyon Dam and Supporting Infrastructure

The dam project is described in the project description of the environmental document. For the purposes of the traffic impact analysis, the construction period traffic is the key project element. Once operational, the dam is not anticipated to generate substantial traffic. Traffic generated by maintenance personnel, while not estimated here, is understood to be minimal during weekday peak hours.

Dam Construction Plan

The Del Puerto Canyon Dam would be constructed over a period of about four years, from April 2023 to March 2027.

The construction vehicle estimates and schedule description for the construction of the dam and associated facilities are provided in the Technical Appendix. Based on this information, the following traffic would be generated on a daily basis at various times during the construction of the various project elements:

- Dam construction: 23 worker round trips, up to 74 truck round trips
- Pipeline construction: 20 worker round trips, up to 75 truck round trips
- Pumping plant construction: 20 worker round trips, up to 51 truck round trips
- Petroleum pipeline relocation: 20 worker round trips, 53 truck round trips
- Transmission line relocation: 20 worker round trips, 2 truck round trips

It is very unlikely that all of these construction elements would simultaneously generate peak traffic for extended periods. Both workforce levels and truck deliveries/off-hauling/cement pours etc. are expected to fluctuate depending on the detailed schedules of each construction component, which have not yet been developed. Nevertheless, there may be periods during the overall four-year construction schedule when over 300 daily round trips could be generated. This would be additive to the daily trips generated by the roadway realignment construction.

All construction trucks and worker vehicles would access the project via the I-5/Diablo Grande Parkway/Sperry Avenue interchange, to Del Puerto Canyon Road.

Construction Peak Hour Trip Generation

The construction plans and schedules described above have not been developed to a level of detail that would allow estimates of total daily and peak hour traffic volumes per phase during the roughly five years of construction activity (February 2022 to March 2027). However, based on the available information, Fehr & Peers developed a possible scenario for the AM and PM peak commute hour volumes at the study intersections, as follows:

- 10% of the construction workforce would arrive and depart in the AM and PM peak hours, respectively
- 10% of the daily truck round trips would arrive and depart in the AM and PM peak hours, respectively

For the heavy vehicle trips, a Passenger Car Equivalent (PCE) factor is applied within the intersection analysis software to account for the large number of heavy vehicle trips. For intersection operations, the PCE factor was assumed to be two, which effectively doubles the number of vehicles assumed in the intersection analysis (for heavy vehicles only). Based on the available data, it was determined that about 70% of peak hour construction traffic would be made up of heavy vehicle trips.

Table 3: Peak Hour Construction Traffic Estimates

Construction Component	AM Peak Hour		PM Peak Hour	
	In	Out	In	Out
Worker vehicle trips	18	6	6	18
Trucks	26	20	25	21

Note: These estimates are rough approximations for purposes of the intersection operations analysis, and actual traffic throughout the five-year construction period may be higher or lower on any given day.
Source: Fehr & Peers, August 2019.

Trip Distribution and Assignment

Peak hour construction trips were distributed based on available truck route information and the project's proximity to the cities of Patterson, Modesto, Turlock, etc. The following distributions were assumed for construction vehicle and worker traffic:

Heavy vehicle traffic

- 40% of trips to/from the North on Interstate 5
- 40% of trips to/from the South on Interstate 5
- 20% of trips to/from the Patterson, Turlock, Modesto area, east of the I-5/Diablo Grande Parkway/ Sperry Avenue Interchange

Worker traffic

- 33% of trips to/from the North on Interstate 5
- 33% of trips to/from the South on Interstate 5
- 33% of trips to/from the Patterson, Turlock, Modesto area, east of the I-5/Diablo Grande Parkway/ Sperry Avenue Interchange

Trips were then assigned through the roadway network, to the project site. All trips were assigned through the study intersections at the I-5/Diablo Grande Parkway/Sperry Avenue interchange. For the purpose of intersection analysis, it was assumed all trips associated with the roadway realignment would enter and exit the project site from Diablo Grande Parkway. All Dam construction trips would enter and exit the project site from Del Puerto Canyon Road.

Post-Construction Conditions

Upon completion of the roadway realignment and dam construction, trips currently using Del Puerto Canyon Road between Diablo Grande Parkway and points east would use the chosen roadway realignment alternative. This would re-route westbound right turns and southbound left turns at the intersection of Del Puerto Canyon Road/Diablo Grande Parkway to the new intersection of the chosen roadway realignment alternative with Diablo Grande Parkway. (Note that the May 2019 traffic counts recorded no eastbound left turns nor southbound right turns at the existing intersection of Del Puerto Canyon Road/Diablo Grande Parkway.)

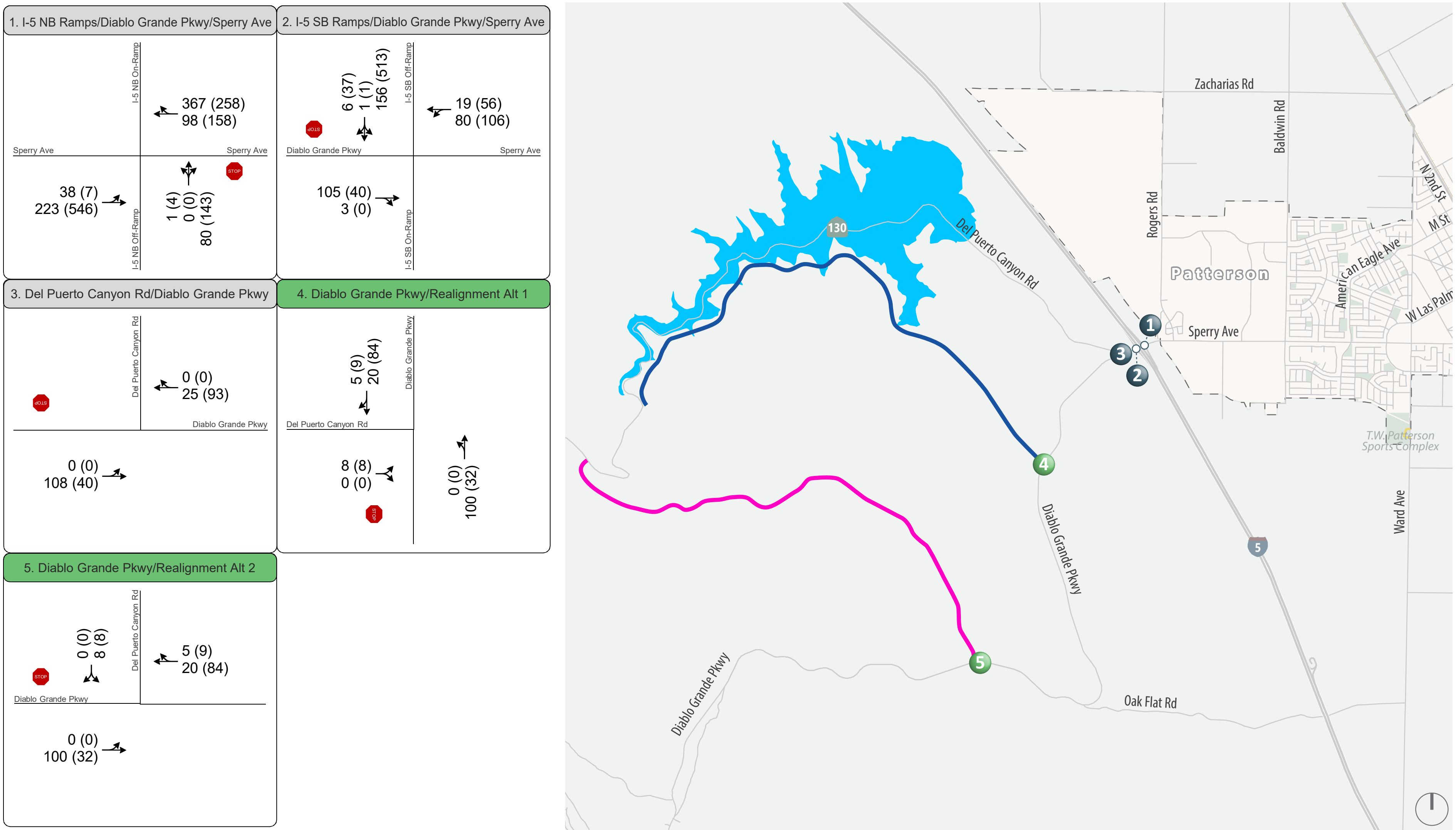
The disposition of the remaining stub of Del Puerto Canyon Road north of Diablo Grande Parkway when the project is complete and the reservoir is operational is not known at this time; therefore, this intersection is not analyzed in the post-construction scenarios (Chapters 4 and 6).

Chapter 4 – Existing With Project Conditions

This chapter presents the impacts of the completed project when compared to existing conditions. While the project is not anticipated to be completed until the year 2027, CEQA guidance suggests that an assessment of project impacts relative to the baseline that exists at the time that notice of preparation of an environmental document is published may provide a meaningful assessment of project impacts.

Traffic Volumes

As described in Chapter 3, the effect of the completed project on traffic volumes will be to re-route turning movements at the intersection of Del Puerto Canyon Road/Diablo Grande Parkway to the intersection of the chosen roadway realignment alternative and Diablo Grande Parkway. **Figure 3** presents the volumes at the study intersections, including the two potential new intersections formed by the two realignment alternatives with Diablo Grande Parkway.



* **NOTE:** The disposition and use of the remaining section of Del Puerto Canyon Road north of Diablo Grande Parkway is not known at this time.

XX (YY) AM (PM) Peak Hour Traffic Volumes — Stop Sign — # Study Intersection

Existing Intersection — # Potential Future Intersection — Roadway Realignment Alternative 1 — Roadway Realignment Alternative 2 — Inundation and Dam Area

Figure 3

Existing with Project Conditions Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Controls

WC19-3603_3_Vols-Existing-WP

Intersection Operations

Table 4 presents the intersection levels of service under Existing With Project conditions. With the re-routed traffic volumes to either Roadway Realignment Alternative 1 or Roadway Realignment Alternative 2, the resulting intersection levels of service at the two remaining existing intersections (the I-5 ramp intersections) would remain unchanged. The levels of service at the potential new intersections formed by either Roadway Realignment Alternative 1 or Roadway Realignment Alternative 2 with Diablo Grande Parkway would be similar to the levels of service at the existing intersection of Del Puerto Canyon Road/Diablo Grande Parkway.

All intersection service levels would be within the applicable LOS standard, with the exception of the southbound approach at the intersection of Diablo Grande Parkway/Sperry Avenue/I-5 Southbound Ramps in the PM peak hour, which would remain LOS E. The project does not add traffic to this intersection, and therefore has a less than significant impact at the intersection.

The LOS worksheets are included in the Technical Appendix.

Table 4: Existing With Project Intersection Levels of Service

ID	Intersection	Control Type	Peak Hour	Existing		Existing With Project	
				Delay[1]	LOS	Delay[1]	LOS
1	Diablo Grande Parkway/Sperry Avenue/I-5 Northbound Ramps	Side-Street Stop	AM PM	1.4 (10.2) 2.0 (15.0)	A (B) A (C)	1.4 (10.2) 2.0 (15.0)	A (B) A (C)
2	Diablo Grande Parkway/Sperry Avenue/I-5 Southbound Ramps	Side-Street Stop	AM PM	7.3 (12.7) 31.0 **(40.9)**	A (B) D **(E)**	7.3 (12.7) 31.0 **(40.9)**	A (B) D **(E)**
3	Del Puerto Canyon Road/Diablo Grande Parkway	Side-Street Stop	AM PM	0.6 (9.2) 0.6 (9.2)	A (A) A (A)	-	-
4	Diablo Grande Parkway/Roadway Realignment Alternative 1	Side-Street Stop	AM PM	-	-	0.6 (9.2) 0.6 (9.2)	A (A) A (A)
5	Diablo Grande Parkway/Roadway Realignment Alternative 2	Side-Street Stop	AM PM	-	-	0.6 (9.2) 0.6 (9.2)	A (A) A (A)

Notes: **Bold text** indicates intersection operates at unacceptable level of service.
1. Whole intersection weighted average control delay expressed in seconds per vehicle calculated using methods described in the 2010 *Highway Capacity Manual*. For side-street stop-controlled intersections, the whole intersection weighted average control delay is reported with the control delay for the worst movement reported in parenthesis.
Source: Fehr & Peers, 2019.

Signal Warrants

Under Existing With Project conditions, the peak hour signal warrant would continue to be met at the Diablo Grande Parkway/Sperry Avenue/I-5 Northbound Ramps intersection and the Diablo Grande Parkway/Sperry Avenue/I-5 Southbound Ramps intersection, as it is met under existing conditions. The Project does not contribute traffic to these intersections.

The re-routing of traffic with the Project (via either roadway realignment alternative) would not cause the peak hour signal warrant to be met at either of the new intersections (Del Puerto Canyon Road/Roadway Realignment Alternative 1 or Del Puerto Canyon Road/Roadway Realignment Alternative 2).

The signal warrant worksheets are included in the Technical Appendix.

Vehicle Miles Traveled

Because the two roadway realignment alternatives result in longer travel distances for trips between Del Puerto Canyon Road/Diablo Grande Road and points east (refer to Chapter 3), the daily vehicle-miles traveled in the study area would increase with either alternative. As shown in **Table 5**, the increase would be 122 vehicle-miles traveled per day with Roadway Realignment Alternative 1, and 346 vehicle-miles traveled per day with Roadway Realignment Alternative 2. These increases constitute six percent and seventeen percent increases over the existing VMT per day, respectively.

Table 5: Vehicle-Miles Traveled: Existing With Project

Case	VMT (1)	VMT Change	% increase
Existing Alignment	2,022	---	
Realignment Alternative 1	2,144	122	6%
Realignment Alternative 2	2,369	346	17%

(1) Vehicle-miles of travel per day.

Impacts and Mitigation Measures – Existing With Project Conditions

The significance criteria for impacts are listed at the end of Chapter 1. Impacts are labeled P-1, P-2 etc. to reflect that these are Project impacts relative to Existing conditions.

Significance Criteria #1

Impact P-1: The Project would not cause any study intersection to fall from an acceptable LOS to an unacceptable LOS, and would not add traffic to any intersection operating at an unacceptable LOS without project traffic. This impact is *less than significant.*

As noted above, the intersection of Diablo Grande Parkway/Sperry Avenue/I-5 Southbound Ramps currently operates at LOS # for the off-ramp approach, which is below the Caltrans standard. However, the Project is not forecast to add traffic to this intersection. Therefore, the impact is less than significant.

Mitigation Measure: None required.

Significance Criteria #2

Impact P-2: The Project would not substantially increase hazards due to design features or incompatible uses. This impact is *less than significant*.

It is presumed that the Project, including the Del Puerto Canyon Dam and supporting infrastructure (including Dam facilities access roadway) and the realigned Del Puerto Canyon Road, will be designed in conformance with all applicable codes and standards. The realigned roadway and Dam facilities access roadway (if needed) can therefore be assumed to comply with roadway standard plans and specifications maintained by Stanislaus County, the Caltrans Highway Design Manual (where applicable), and the California Manual on Uniform Traffic Control Devices. Once complete, the Dam and realigned roadway are not expected to serve a different traffic mix (more heavy vehicles, for example) than currently uses the study area roadways. Therefore, this impact is less than significant.

Mitigation Measure: None required.

Significance Criteria #3

Impact P-3: The Project would not result in inadequate emergency access within the study area. This impact is *less than significant*.

The Project would increase the travel distance for drivers on Del Puerto Canyon Road between points east of the Dam and west of the Dam by 0.44 miles for Roadway Realignment Alternative 1 and by 1.25 miles for Roadway Realignment Alternative 2. While emergency responders destined for points on Del Puerto Canyon Road within the study area would potentially need to travel longer distances to reach their destination, the realigned roadway alternatives would not impede responders, as they would be designed to conform with applicable design standards (see discussion under Impact #2). The realigned roadway alternatives would not affect emergency response travel routes or times to the community of Diablo Grande nor Patterson, as emergency responders would virtually all come to/from the east (City of Patterson) or the north or south on I-5. Therefore, this impact is less than significant.

Mitigation Measure: None required.

Significance Criteria #4

Impact P-4: The Project would not conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities. This impact is *less than significant.*

There are currently no pedestrian or bicycle facilities, nor transit service, on the portion of Del Puerto Canyon Road that will be abandoned and realigned, and no plans currently exist to add such facilities or service. Because the realigned roadway is expected to be designed to conform with all applicable design standards (see discussion under Impact #2), the roadway will provide adequate vehicle lane widths and shoulder widths, signing and striping, to serve motorized vehicles and bicyclists. It is assumed at this time that dedicated bicycle lanes would not be provided, since none currently exist on Del Puerto Canyon Road. Based on this evaluation, this impact is less than significant.

Mitigation Measure: None required.

Chapter 5 – Near-Term Conditions

This chapter presents the impacts of the construction of the roadway realignment, dam, and supporting infrastructure. The trip generation and distribution of the construction projects, based on data that is currently available, is described in Chapter 3.

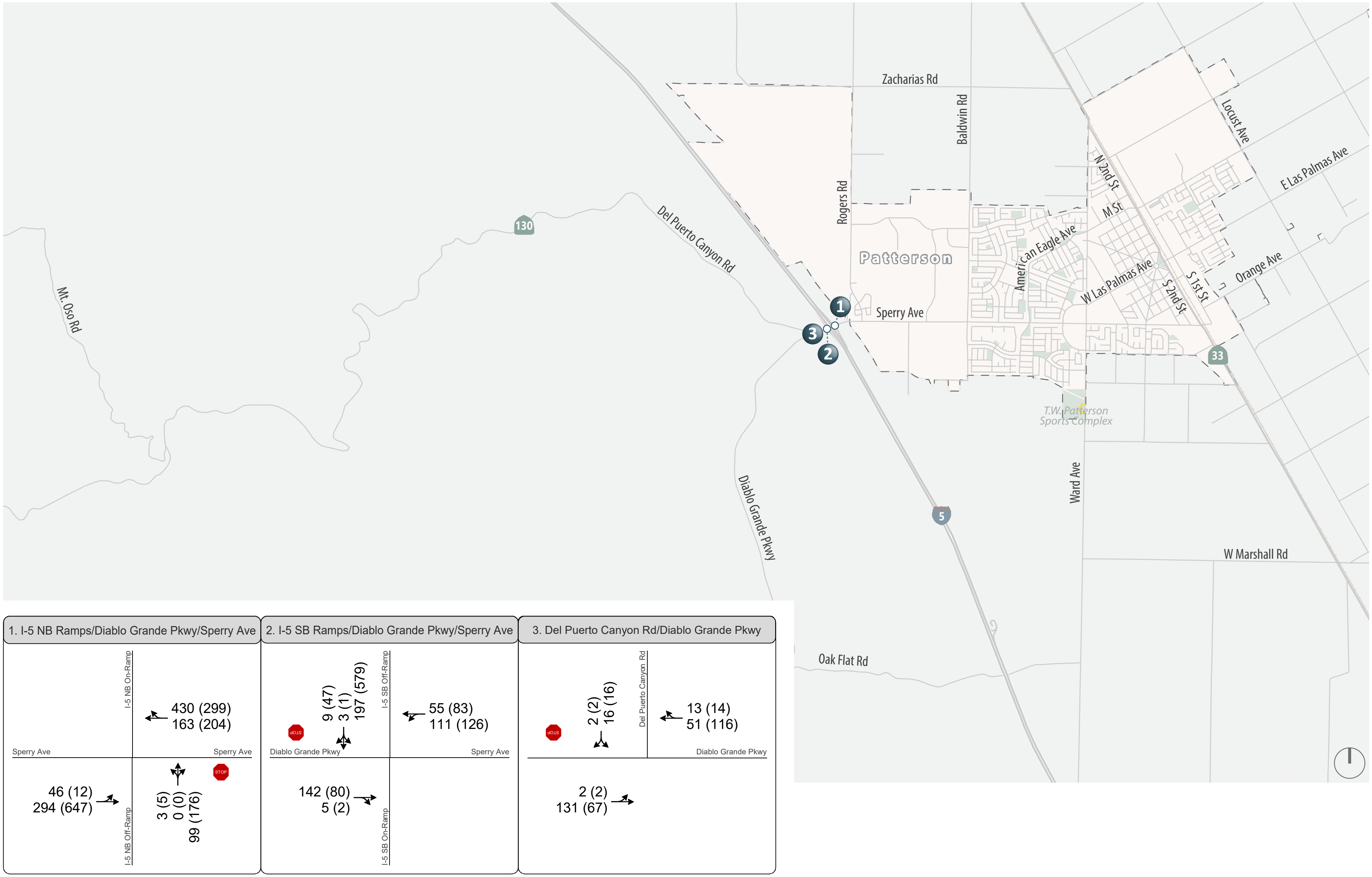
Near-Term Traffic Volumes

The construction of the dam, supporting infrastructure, and roadway realignment will take about five years, from February 2022 to March 2027. The mid-point of construction would be fall 2024. To estimate intersection traffic volumes in fall 2024, a straight-line interpolation between the May 2019 existing traffic counts and the 2040 cumulative traffic forecasts (presented in Chapter 6) was developed. The resulting Near-Term No Project intersection volumes are shown in **Figure 4**.

The construction of the dam, supporting infrastructure, and the roadway realignment will generate varying levels of worker and truck traffic throughout the five-year construction schedule. An estimate of potential typical AM and PM peak hour trips was developed as described in Chapter 3. The resulting construction volumes at the study intersections are shown in **Figure 5**. **Figure 6** shows the Near-Term With Construction peak hour intersection volumes.

Intersection Operations

Table 6 presents the intersection levels of service in the Near Term, without construction traffic and with construction traffic. The intersection of Diablo Grande Parkway/Sperry Avenue/I-5 Southbound Ramps would continue to operate at an unacceptable Level of Service in the PM peak hour, with or without the construction traffic. The addition of construction traffic results in a temporary significant impact to intersection operations by contributing further delay to the deficient intersection during project construction.

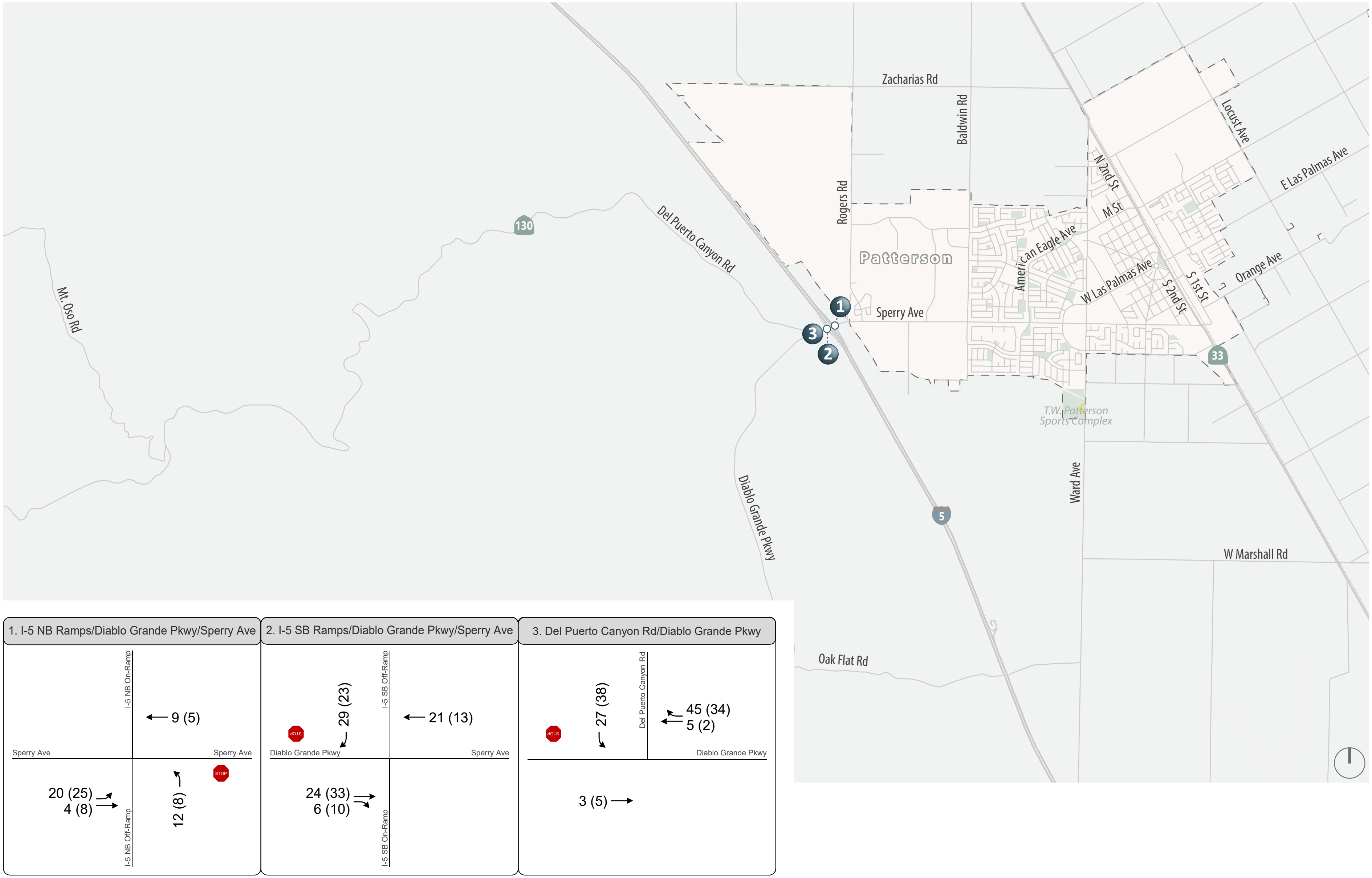


XX (YY) AM (PM) Peak Hour Traffic Volumes STOP Stop Sign # Study Intersection

Figure 4

Near-Term No Project Conditions Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Controls

WC19-3603_4-5-6_Vols-NearTerm

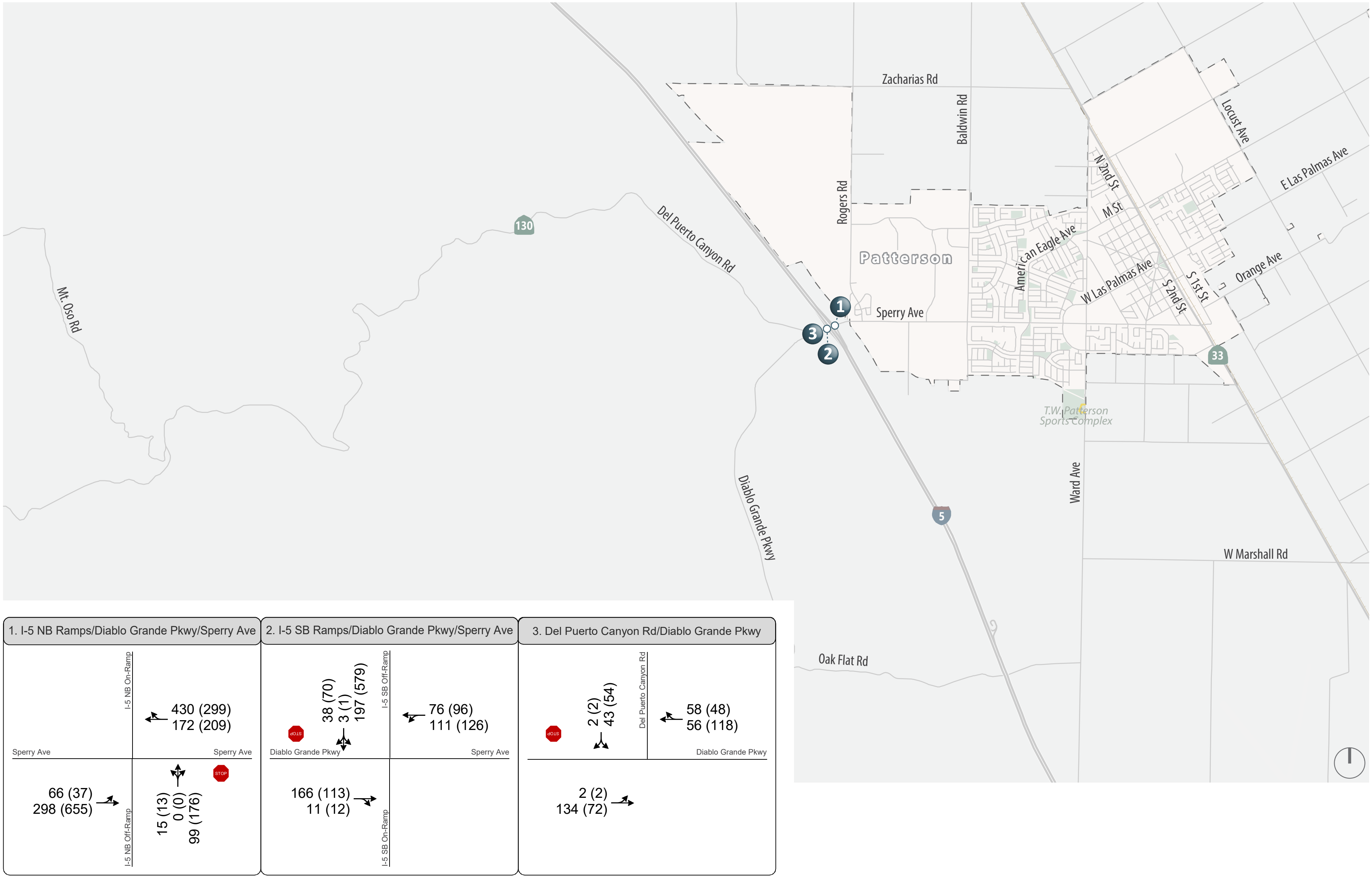


XX (YY) AM (PM) Peak Hour Traffic Volumes · Stop Sign · # Study Intersection

Figure 5

Construction Project Peak Hour Trip Assignment

WC19-3603_4-5-6_Vols-NearTerm



XX (YY) AM (PM) Peak Hour Traffic Volumes · STOP Stop Sign · # Study Intersection

Figure 6

Near-Term with Construction Conditions Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Controls

WC19-3603_4-5-6_Vols-NearTerm

Table 6: Near-Term Intersection Levels of Service

ID	Intersection	Control Type	Peak Hour	No Project		During Construction	
				Delay[1]	LOS	Delay[1]	LOS
1	Diablo Grande Parkway/Sperry Avenue/I-5 Northbound Ramps	Side-Street Stop	AM PM	1.5 (11.2) 2.7 (19.1)	A (B) A (C)	2.1 (13.4) 3.4 (22.5)	A (B) A (C)
2	Diablo Grande Parkway/Sperry Avenue/I-5 Southbound Ramps	Side-Street Stop	AM PM	8.6 (17.4) **90.4 (130.8)**	A (C) **F (F)**	9.3 (20.1) **131.2 (202.8)**	A (C) **F (F)**
3	Del Puerto Canyon Road/Diablo Grande Parkway	Side-Street Stop	AM PM	0.9 (9.7) 0.9 (9.6)	A (A) A (A)	1.9 (10.4) 2.3 (10.3)	A (B) A (B)

Notes: **Bold text** indicates intersection operates at unacceptable level of service.
1. Whole intersection weighted average control delay expressed in seconds per vehicle calculated using methods described in the 2010 *Highway Capacity Manual*. For side-street stop-controlled intersections, the whole intersection weighted average control delay is reported with the control delay for the worst movement reported in parenthesis.
Source: Fehr & Peers, 2019.

Signal Warrants

Under Near-Term No Project and Near-Term With Project Construction conditions, the peak hour signal warrant would continue to be met in the PM peak hour at the Diablo Grande Parkway/Sperry Avenue/I-5 Northbound Ramps intersection and the Diablo Grande Parkway/Sperry Avenue/I-5 Southbound Ramps intersection, as it is met under existing conditions. While the project adds delay to both intersections, these impacts are not significant based on the significance criteria presented in Chapter 1.

It is noted that Stanislaus County, the City of Patterson and Caltrans are in the process of preparing a Project Approval/Environmental Document for the I-5/Diablo Grande Parkway/Sperry Avenue Interchange Improvements project, which would widen Diablo Grande Parkway/Sperry Avenue under I-5 to four lanes, widen the off-ramps to provide multiple turn lanes, and signalized both ramp intersections. The funding plan for this project would come 70 percent from the City of Patterson and 30 percent from Stanislaus County, with both agencies pursuing state and federal funds. Because the PA/ED is not final, Stanislaus County Council of Governments has not yet allocated funding for the project in the Regional Transportation Plan.

Impacts and Mitigation Measures – Near-Term With Project Conditions

The significance criteria for impacts are listed at the end of Chapter 1. Impacts are labeled NT-1, NT-2, etc. to reflect that these are impacts relative to construction of the Project under Near-Term conditions.

Significance Criteria #1

Impact NT-1: Project construction traffic would add delay to an intersection that operates at an unacceptable LOS in the PM peak hour, and would increase delays to study area traffic periodically during the entire workday, throughout the approximately five-year construction schedule. This impact is *significant.*

As noted above, the intersection of Diablo Grande Parkway/Sperry Avenue/I-5 Southbound Ramps is projected to operate at an overall LOS F under Near-Term conditions in the PM peak hour. The construction of the Project is forecast to add about 34 seconds of delay to the intersection average delay, and about 60 seconds of delay to the southbound ramp delay. This is a significant impact based on significance criteria #1. This intersection currently meets the peak hour signal warrant, and would continue to meet the warrant under Near-Term No Project and Near-Term With Project conditions.

In addition, it is noted that the Diablo Grande Parkway/Sperry Avenue/I-5 Northbound Ramps intersection currently meets the peak hour signal warrant in the PM peak hour, and would continue to meet the warrant in the Near-Term No Project and Near-Term With Project conditions; however, the LOS is projected to be acceptable. Therefore, the Project's impact at this intersection is less than significant.

Mitigation Measure NT-1: The Del Puerto Canyon Water District shall work with Stanislaus County and the City of Patterson to contribute a fair share toward the planned I-5 Sperry Avenue Interchange Improvements project. The signal at the I-5 Southbound Ramps intersection is required to mitigate the Project impact. The signal at the I-5 Northbound Ramps intersection is recommended to provide efficient operations at both intersections, which are closely spaced and which would not function acceptably with signal control at one intersection and side-street stop-control at the other. The proportional share calculation should take into account the existing deficiency at the Southbound Ramps intersection and the non-Project traffic volume growth between the Existing and Near-Term No Project cases, as well as the County and City's plans to secure other state and federal funding for the Interchange Improvements project.

Alternatively, the District may pay a traffic mitigation fee per peak hour trip or another negotiated contribution.

Because the planned Interchange Improvements Project is not expected to be fully funded and complete until after the Del Puerto Canyon Dam and Roadway Realignment construction period, Stanislaus County and the City of Patterson may choose to use the District's funding contribution, along with other funding sources if available, to erect temporary traffic signals during the Dam and Roadway Realignment construction.

With the I-5 Sperry Avenue Interchange Improvements, the Near-Term With Project intersection levels of service would improve to acceptable levels. The LOS worksheets for the mitigated condition are included in the Technical Appendix.

Because the provision of the improvements depends on the actions of other agencies, this impact would remain significant and unavoidable after mitigation.

Significance Criteria #2

Impact NT-2: The Project could substantially increase hazards due to design features or incompatible uses. This impact is *significant*.

Project construction will introduce a substantial number of large trucks and other heavy vehicles to the study area, over the course of the approximately five-year construction schedule (refer to Chapter 3). These heavy vehicles may move slowly as they maneuver through the study intersections and cause potential conflicts with regular users of the roadway network, including residents and employees in Patterson and residents in the Diablo Grande community.

Mitigation Measure NT-2: The Del Puerto Canyon Water District shall prepare a detailed construction traffic management plan (CTMP) to address traffic conditions throughout the construction period. As part of the plan development, the District and its construction contractors shall meet with appropriate Stanislaus County, City of Patterson, and Caltrans departments to determine traffic management strategies to reduce, to the maximum extent feasible, traffic congestion and safety effects during construction of the Project. The District shall develop the plans for review and approval by the appropriate City, County and Caltrans departments. The plans shall include at least the following items and requirements:

A. A set of comprehensive traffic control measures, including scheduling of major truck trips and deliveries to avoid peak traffic hours, detour signs if required, lane closure procedures, signs, cones for drivers, and designated construction access routes.

B. Location of construction staging areas for materials, equipment, and vehicles at approved locations.

C. A process for responding to, and tracking, complaints pertaining to construction activity, including identification of an on-site complaint manager. The manager shall determine the cause of the complaints and shall take prompt action to correct the problem.

D. Provision for accommodation of pedestrians and bicyclists in the construction area.

E. Provision for parking management and spaces on the project site for all construction workers to ensure that construction workers do not park on-street where insufficient shoulder space exists.

F. A plan for restoration of pavement to pre-construction conditions, after completion of all construction.

G. Other items deemed necessary by the City, County and Caltrans during preparation of the CMP.

With implementation of this mitigation measure, the impact would be reduced to a less than significant level.

Significance Criteria #3

Impact NT-3: The Project could result in inadequate emergency access within the study area. This impact is *less than significant.*

As described under Impact NT-2, Project construction will introduce a substantial number of large trucks and other heavy vehicles to the study area, over the course of the approximately five-year construction schedule, creating periods of delay to area traffic, which may affect emergency response times. The Construction Traffic Management Plan described in Mitigation Measure NT-2 will address this impact and ensure that the impact on emergency responders is minimized.

Mitigation Measure: Implement Mitigation Measure NT-2.

With implementation of this mitigation measure, the impact would be reduced to a less than significant level.

Significance Criteria #4

Impact NT-4: The Project would not conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, but could decrease the performance or safety of such facilities. This impact is *less than significant.*

There are currently no dedicated bicycle facilities nor pedestrian facilities in the study area, and negligible pedestrian and bicycle activity was observed in the existing conditions traffic, pedestrian and bicycle counts. Nevertheless, Project construction will introduce substantial truck and other heavy vehicle volumes to the study area, which would negatively impact the comfort and convenience of any pedestrians or bicyclists using Del Puerto Canyon Road and Diablo Grande Parkway within the construction area.

Mitigation Measure: Implement Mitigation Measure NT-2.

With implementation of this mitigation measure, the impact would be reduced to a less than significant level.

Chapter 6 – Cumulative Conditions

This chapter presents the impacts of the completed project when compared to cumulative conditions in the year 2040. This year was selected for the cumulative analysis because it is the horizon year for the Stanislaus County Regional Transportation Plan/Sustainable Communities Strategy, and constitutes a reasonably long-term horizon year for impact assessment purposes.

Traffic Forecasts

The traffic forecasts for the year 2040 were derived from residential and employment growth forecasts in the *2018 Stanislaus County Regional Transportation Plan/Sustainable Communities Strategy*. Demographic forecasts contained in Appendix J of this document project the following growth in the City of Patterson and the Diablo Grande community:

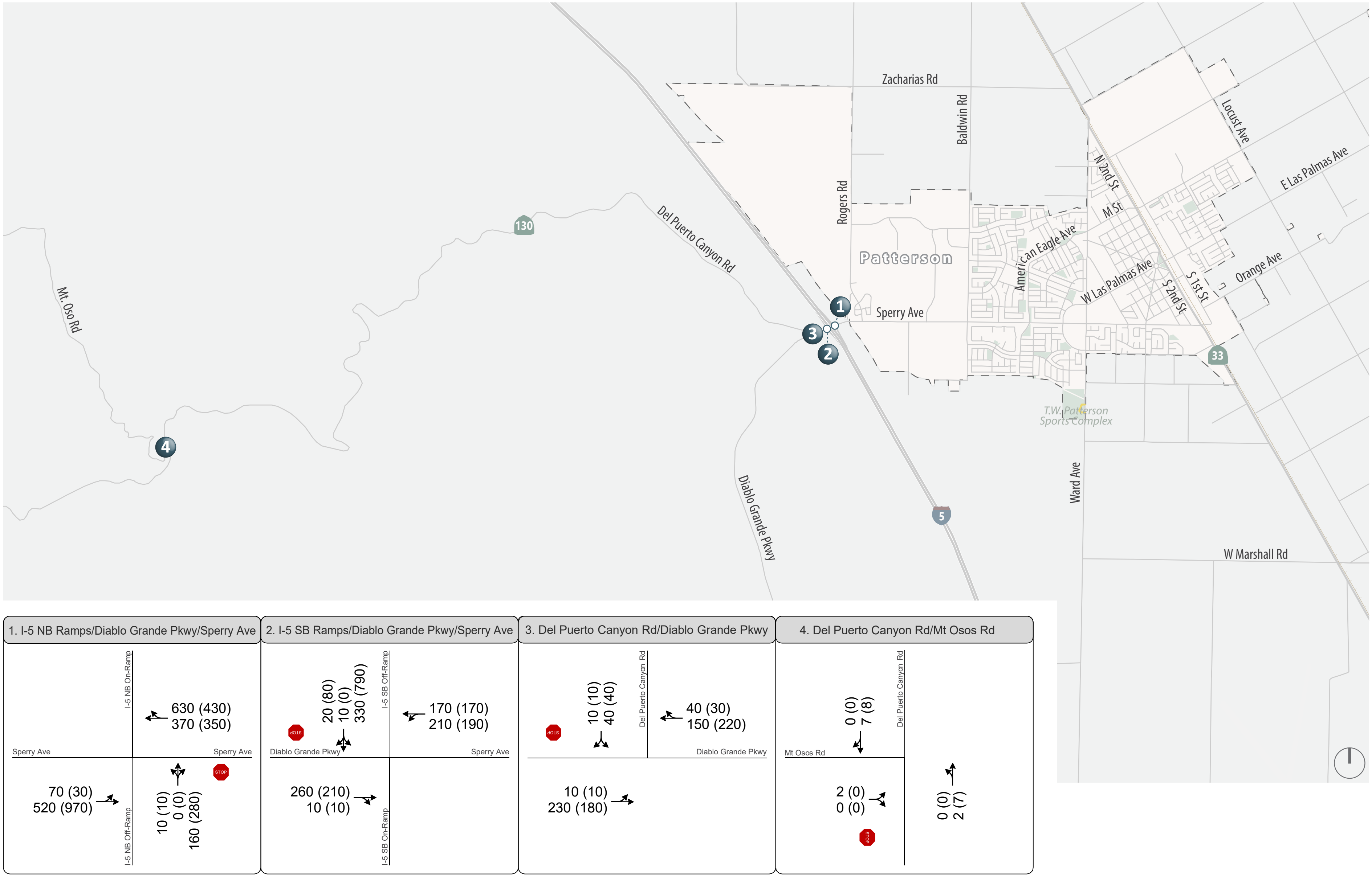
City of Patterson: 4,183 new households, 5,252 new jobs
Diablo Grande Community: 194 new households

The peak hour trip generation associated with this growth in households and jobs was estimated using trip generation rates from ITE *Trip Generation, 10th Edition*. The households were assumed to be all single family (ITE land use code #210). The jobs were allocated to office (40%), light industrial (35%) and retail (25%), based on a high-level assessment of the current land use mix in Patterson (ITE and use codes #710, #110, and #820, respectively). The trip generation calculations are included in the Technical Appendix.

The trip distribution for the new Diablo Grande community trips was assumed to be 100 percent to/from the I-5 interchange, with the assignment to individual turning movements based on the existing proportional turning movements at these intersections (including through-trips to the east, to Patterson). The trip distribution for new Patterson trips was derived from the Stanislaus – San Joaquin – Merced Three-County Travel Demand Model, which indicates that about 19 percent of residential trips travel to/from I-5 and 10 percent of employment trips travel to/from I-5. These trips were then assigned to the study intersections based on the existing proportional turning movements at the intersections.

In addition to the above growth forecasts, the traffic on Del Puerto Canyon Road north of Diablo Grande Parkway was increased by one percent per year to reflect potential nominal growth on this very low-volume roadway.

The resulting Cumulative (2040) No Project intersection turning movements are shown in **Figure 7**. The Cumulative (2040) With Project intersection turning movements are shown in **Figure 8**. The Cumulative With Project volumes represent the re-routing of turning movements at the existing intersection of Del Puerto Canyon Road/Diablo Grande Parkway to the intersections of Roadway Realignment Alternative 1 or Roadway Realignment Alternative 2 with Diablo Grande Parkway, respectively.

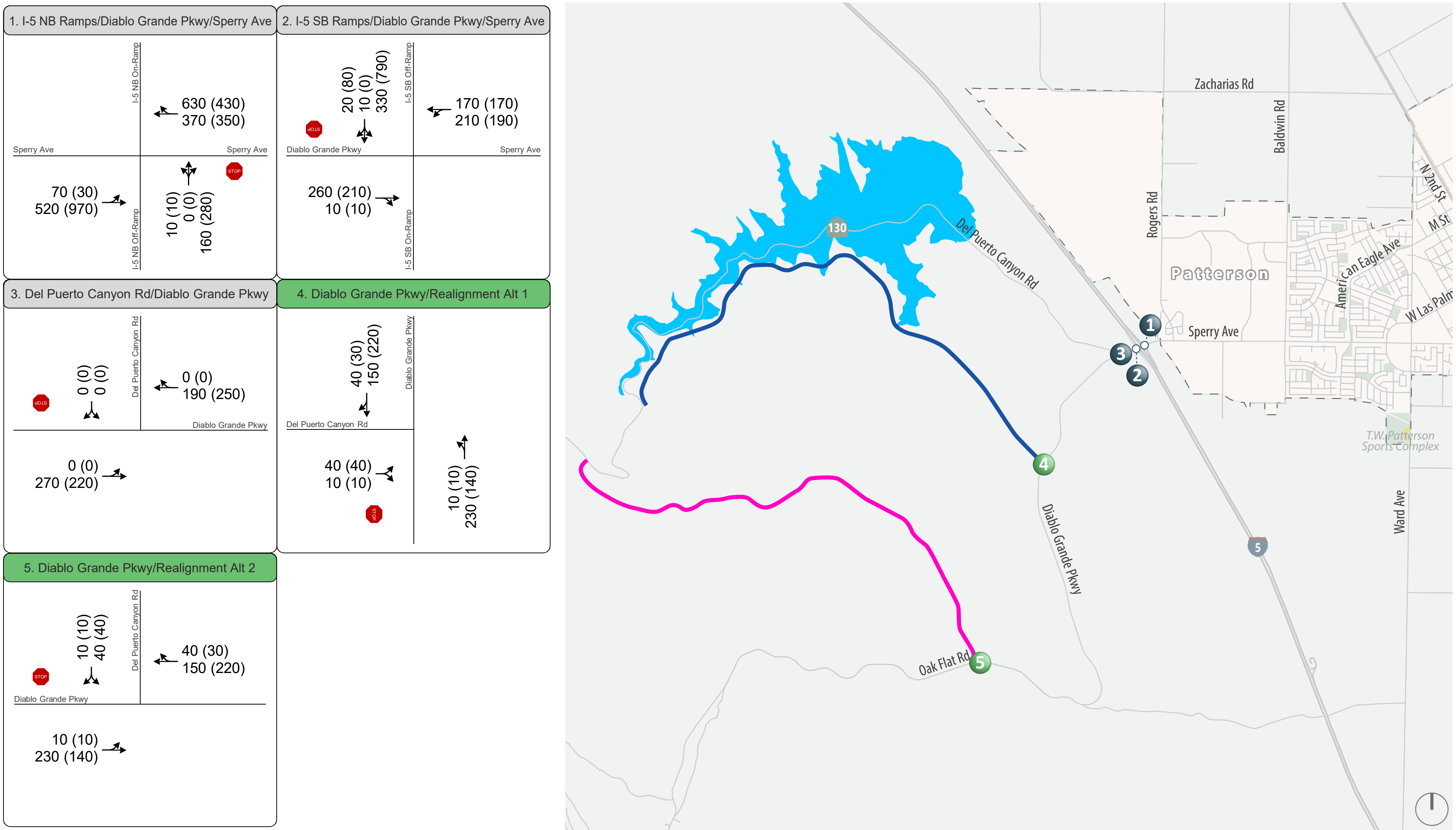


XX (YY) AM (PM) Peak Hour Traffic Volumes STOP Stop Sign # Study Intersection

Figure 7

Cumulative (2040) No Project Conditions Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Controls

WC19-3603_7_Vols-Cumu



* **NOTE:** The disposition and use of the remaining section of Del Puerto Canyon Road north of Diablo Grande Parkway is not known at this time.

XX (YY) AM (PM) Peak Hour Traffic Volumes | Stop Sign | # Study Intersection

Existing Intersection | # Potential Future Intersection | Roadway Realignment Alternative 1 | Roadway Realignment Alternative 2 | Inundation and Dam Area

Figure 8

Cumulative (2040) With Project Conditions Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Controls

WC19-3603_8_Vols-Cumu-WP

Intersection Operations

Table 7 presents the Cumulative (2040) No Project and With Project levels of service. The significant traffic growth forecast for the City of Patterson, along with Diablo Grande community growth, results in LOS F conditions for the stop-controlled approaches at both I-5 ramp intersections. This projected LOS is unaffected by the Project, which does not change the traffic projection at these two intersections. The LOS at the intersections of Roadway Realignment Alternative 1/Del Puerto Canyon Road and Roadway Realignment Alternative 2/Del Puerto Canyon Road are projected to be within the applicable standard.

Table 7: Cumulative (2040) With Project Intersection Levels of Service

ID	Intersection	Control Type	Peak Hour	Cumulative No Project		Cumulative With Project	
				Delay[1]	LOS[2]	Delay[1]	LOS[2]
1	Diablo Grande Parkway/Sperry Avenue/I-5 Northbound Ramps	Side-Street Stop	AM PM	2.4 (19.8) 18.3**(129.7)**	A (C) C **(F)**	2.4 (19.8) 18.3**(129.7)**	A (C) C **(F)**
2	Diablo Grande Parkway/Sperry Avenue/I-5 Southbound Ramps	Side-Street Stop	AM PM	**124 (>200)** **528 (>200)**	**F (F)** **F (F)**	**124 (>200)** **>200 (>200)**	**F (F)** **F (F)**
3	Del Puerto Canyon Road/Diablo Grande Parkway	Side-Street Stop	AM PM	1.4 (11.7) 1.3 (11.7)	A (B) A (B)	-	-
4	Diablo Grande Parkway/Roadway Realignment Alternative 1	Side-Street Stop	AM PM	-	-	1.4 (11.6) 1.4 (11.5)	A (B) A (B)
5	Diablo Grande Parkway/Roadway Realignment Alternative 2	Side-Street Stop	AM PM	**-**	**-**	1.4 (11.6) 1.4 (11.5)	A (B) A (B)

Notes: **Bold text** indicates intersection operates at unacceptable level of service.
1. Whole intersection weighted average control delay expressed in seconds per vehicle calculated using methods described in the 2010 *Highway Capacity Manual* for signalized intersections and all-way stop-controlled intersections. For side-street stop-controlled intersections, the whole intersection weighted average control delay is reported with the control delay for the worst movement reported in parenthesis.
Source: Fehr & Peers, 2019.

Signal Warrants

Under Cumulative conditions, with or without the project, the peak hour traffic signal warrant would continue to be met at the two Diablo Grande Parkway/Sperry Avenue/I-5 Ramp intersections, as it is under existing conditions. The projected growth in traffic generated by the City of Patterson and the Diablo Grande community by the year 2040 would worsen conditions and make provision of traffic signals more important to reduce congestion and manage peak hour traffic flows. The signal warrant worksheets are included in the Technical Appendix.

Vehicle Miles Traveled

Because the two roadway realignment alternatives result in longer travel distances for trips between Del Puerto Canyon Road/Diablo Grande Road and points east (refer to Chapter 3), the daily vehicle-miles traveled in the study area would increase with either alternative. As shown in **Table 8**, the increase would be 149 vehicle-miles traveled per day with Roadway Realignment Alternative 1, and 423 vehicle-miles traveled per day with Roadway Realignment Alternative 2. These increases constitute six percent and seventeen percent increases over the existing VMT per day, respectively.

Table 8: Vehicle-Miles Traveled: Cumulative With Project

Case	VMT (1)	VMT Change	% increase
Existing Alignment	2,467	---	
Realignment Alternative 1	2,616	149	6%
Realignment Alternative 2	2,890	423	17%

(1) Vehicle-miles of travel per day.

Impacts and Mitigation Measures – Cumulative With Project Conditions

The significance criteria for impacts are listed at the end of Chapter 1. The impacts below are labeled C-1, C-2 etc. to reflect that these are Cumulative impacts.

Significance Criteria #1

Impact C-1: The Project would not cause any study intersection to fall from an acceptable LOS to an unacceptable LOS, and would not add traffic to any intersection operating at an unacceptable LOS without project traffic. This impact is *less than significant.*

As shown in Table 7, the intersections of Diablo Grande Parkway/Sperry Avenue/I-5 Northbound Ramps and Diablo Grande Parkway/Sperry Avenue/I-5 Southbound Ramps are projected to operate at LOS F for the off-ramp approaches, and Diablo Grande Parkway/Sperry Avenue/I-5 Southbound Ramps is projected to operate at an overall LOS F in the PM peak hour. These results are below the Caltrans standard. However, the Project is not forecast to add traffic to this intersection under Cumulative conditions. Therefore, the impact is less than significant.

Mitigation Measure: None required.

Significance criteria #2, #3 and #4 are addressed in Chapter 4 (Existing With Project conditions) and the same findings apply for the cumulative analysis.

Appendix A: Traffic Count Sheets

Prepared by National Data & Surveying Services

I-5 NB Ramps & Del Puerto Canyon Rd

Peak Hour Turning Movement Count

ID: 19-07182-001
City: Patterson

Day: Thursday
Date: 05/16/2019

	PEAK HOURS	COUNT PERIODS
AM	07:00 AM - 08:00 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:15 PM - 05:15 PM	04:00 PM - 06:00 PM

I-5 NB Ramps — SOUTHBOUND

	Right	Thru	Left	U-Turn	Departing
AM	0	0	0	0	405
NOON	0	0	0	0	0
PM	0	0	0	0	265
Lanes	0	0	0	0	

Del Puerto Canyon Rd — EASTBOUND

	AM	NOON	PM	Lanes
Departing	99	0	161	
U-Turn	0	0	0	0
Left	38	0	7	0
Thru	222	0	546	1
Right	0	0	0	0

Del Puerto Canyon Rd — WESTBOUND

	PM	NOON	AM	Lanes
Right	258	0	367	0
Thru	157	0	98	1
Left	0	0	0	0
U-Turn	0	0	0	0
Departing	689	0	302	

I-5 NB Ramps — NORTHBOUND

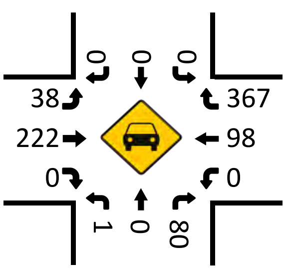
	Departing	U-Turn	Left	Thru	Right
Lanes		0	0	1	0
PM	0	0	4	0	143
NOON	0	0	0	0	0
AM	0	0	1	0	80

CONTROL

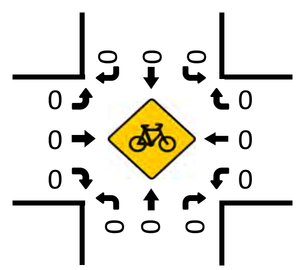
1-Way Stop(NB)

	AM	NOON	PM
TEV	806	0	1115
PHF	0.90		0.96

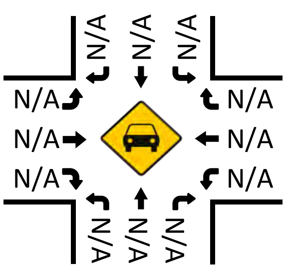
Total Vehicles (AM)



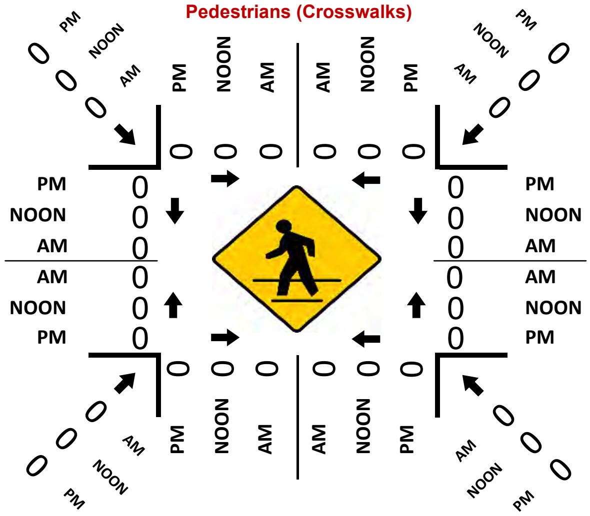
Bikes (AM)



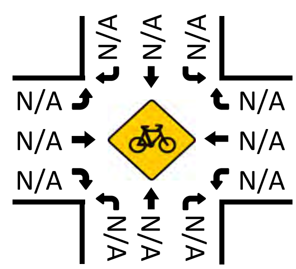
Total Vehicles (Noon)



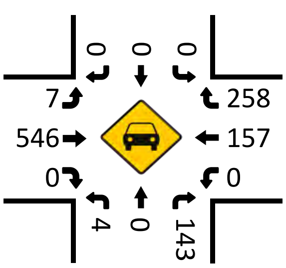
Pedestrians (Crosswalks)



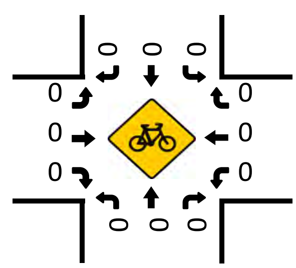
Bikes (NOON)



Total Vehicles (PM)



Bikes (PM)



Prepared by National Data & Surveying Services

I-5 SB Ramps & Del Puerto Canyon Rd

Peak Hour Turning Movement Count

ID: 19-07182-002
City: Patterson

Day: Thursday
Date: 05/16/2019

	PEAK HOURS	COUNT PERIODS
AM	07:00 AM - 08:00 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

I-5 SB Ramps – SOUTHBOUND

	Right	Thru	Left	U-Turn	Departing
AM	6	1	156	0	0
NOON	0	0	0	0	0
PM	47	1	518	0	0
Lanes	0	1	0	0	

Del Puerto Canyon Rd – EASTBOUND

	AM	NOON	PM	Lanes
Departing	25	0	93	
U-Turn	0	0	0	0
Left	0	0	0	0
Thru	105	0	44	1
Right	3	0	1	0

Del Puerto Canyon Rd – WESTBOUND

	Lanes	PM	NOON	AM
Right	0	0	0	0
Thru	1	46	0	19
Left	0	95	0	80
U-Turn	0	0	0	0
Departing		562	0	261

I-5 SB Ramps – NORTHBOUND

	Departing	U-Turn	Left	Thru	Right
Lanes		0	0	0	0
PM	97	0	0	0	0
NOON	0	0	0	0	0
AM	84	0	0	0	0

CONTROL

1-Way Stop(SB)

	AM	NOON	PM
TEV	370	0	752
PHF	0.93		0.95

Total Vehicles (AM)

Approach	Left	Thru	Right	U-Turn
Southbound	156	1	6	
Eastbound	0	105	3	
Westbound	80	19	0	
Northbound	0	0	0	

Total Vehicles (Noon)

Approach	Left	Thru	Right
Southbound	N/A	N/A	N/A
Eastbound	N/A	N/A	N/A
Westbound	N/A	N/A	N/A
Northbound	N/A	N/A	N/A

Total Vehicles (PM)

Approach	Left	Thru	Right
Southbound	518	1	47
Eastbound	0	44	1
Westbound	95	46	0
Northbound	0	0	0

Bikes (AM)

Approach	Left	Thru	Right
Southbound	0	0	0
Eastbound	0	0	0
Westbound	0	0	0
Northbound	0	0	0

Bikes (NOON)

Approach	Left	Thru	Right
Southbound	N/A	N/A	N/A
Eastbound	N/A	N/A	N/A
Westbound	N/A	N/A	N/A
Northbound	N/A	N/A	N/A

Bikes (PM)

Approach	Left	Thru	Right
Southbound	0	0	0
Eastbound	0	0	0
Westbound	0	0	0
Northbound	0	0	0

Pedestrians (Crosswalks)

Location	AM	NOON	PM
North crosswalk (eastbound)	0	0	0
North crosswalk (westbound)	0	0	0
South crosswalk (eastbound)	0	0	0
South crosswalk (westbound)	0	0	0
West crosswalk (southbound)	0	0	0
West crosswalk (northbound)	0	0	0
East crosswalk (southbound)	0	0	0
East crosswalk (northbound)	0	0	0
NW corner (diagonal)	0	0	0
NE corner (diagonal)	0	0	0
SW corner (diagonal)	0	0	0
SE corner (diagonal)	0	0	0

Prepared by National Data & Surveying Services

Del Puerto Canyon Rd & Diablo Grande Pkwy/Del Puerto Canyon Rd

Peak Hour Turning Movement Count

ID: 19-07182-003
City: Patterson

Day: Thursday
Date: 05/16/2019

PEAK HOURS		COUNT PERIODS
AM	07:00 AM - 08:00 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:30 PM - 05:30 PM	04:00 PM - 06:00 PM

Del Puerto Canyon Rd — SOUTHBOUND

					Exit
AM	0	0	8	0	5
NOON	0	0	0	0	0
PM	0	0	8	0	9
	0	1	0	0	

Diablo Grande Pkwy/Del Puerto Canyon Rd — EASTBOUND

	AM	NOON	PM	
Exit	19	0	84	
	0	0	0	0
	0	0	0	0
	99	0	35	1
	0	0	0	0

Diablo Grande Pkwy/Del Puerto Canyon Rd — WESTBOUND

	PM	NOON	AM
0	9	0	5
1	84	0	19
0	0	0	0
0	0	0	1
Exit	43	0	108

Del Puerto Canyon Rd — NORTHBOUND

	Exit				
		0	0	0	0
PM	0	0	0	0	0
NOON	0	0	0	0	0
AM	0	0	0	0	0

CONTROL

1-Way Stop(SB)

	AM	NOON	PM
TEV	132	0	136
PHF	0.80		0.87

Total Vehicles (AM)

SB: 0, 0, 8 — EB: 0, 99, 0 — WB: 5, 19, 0 — NB: 0, 0, 0

Total Vehicles (Noon)

SB: N/A, N/A, N/A — EB: N/A, N/A, N/A — WB: N/A, N/A, N/A — NB: N/A, N/A, N/A

Total Vehicles (PM)

SB: 0, 0, 8 — EB: 0, 35, 0 — WB: 9, 84, 0 — NB: 0, 0, 0

Bikes (AM)

SB: 0, 0, 0 — EB: 0, 0, 0 — WB: 0, 0, 0 — NB: 0, 0, 0

Bikes (NOON)

SB: N/A, N/A, N/A — EB: N/A, N/A, N/A — WB: N/A, N/A, N/A — NB: N/A, N/A, N/A

Bikes (PM)

SB: 0, 0, 0 — EB: 0, 0, 0 — WB: 0, 0, 0 — NB: 0, 0, 0

Pedestrians (Crosswalks)

	AM	NOON	PM
North	0 / 0	0 / 0	0 / 0
South	0 / 0	0 / 0	0 / 0
West	0 / 0	0 / 0	0 / 0
East	0 / 0	0 / 0	0 / 0
NW corner	0	0	0
NE corner	0	0	0
SW corner	0	0	0
SE corner	0	0	0

Appendix B: 2040 Forecast Trip Generation

2040 FORECAST VEHICLE TRIP GENERATION ESTIMATES

Use	Size	Weekday						
		Daily	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Diablo Grande Residential Development[1]								
Single-Family Detached Housing[2]	194 Dwelling Units	1,832	36	108	144	122	71	193
Patterson Residential Development[1]								
Single-Family Detached Housing[2]	4,183 Dwelling Units	39,488	774	2,321	3,095	2,609	1,533	4,142
Patterson Non-Residential Development[3]								
Shopping Center[4]	1,313 Employees	21,153	462	260	722	1,064	1,064	2,128
Light Industrial[5]	1,838 Employees	5,607	793	163	956	198	703	901
Office[6]	2,101 Employees	6,891	645	132	777	168	673	841
	Total Vehicle Trips	***74,971***	***2,010***	***2,984***	***5,694***	***4,161***	***4,044***	***8,205***

1. Residential Development taken from the 2018 StanCOG RTP/SCS Countywide Housing Unit Forecasts
2. ITE land use category 210 – Single-Family Detached Housing (Adj Streets, 7-9A, 4-6P):
   Daily: T = 9.44 (X)
   AM Peak Hour: T = 0.74 (X); Enter = 25%; Exit = 75%
   PM Peak Hour: T = 0.99 (X); Enter = 63%; Exit = 37%
3. Non-Residential Development taken from the 2018 StanCOG RTP/SCS Countywide Employment Forecasts. Employment numbers per land use were distributed based on the Countywide Forecasting Model.
4. ITE land use category 820 – Shopping Center - Attached (Adj Streets, 7-9A, 4-6P):
   Daily: T = 16.11 (X)
   AM Peak Hour: T = 0.55 (X); Enter = 62%; Exit = 38%
   PM Peak Hour: T = 1.62 (X); Enter = 50%; Exit = 50%
5. ITE land use category 110 – Light Industrial - Attached (Adj Streets, 7-9A, 4-6P):
   Daily: T = 3.05 (X)
   AM Peak Hour: T = 0.52(X); Enter = 83%; Exit = 17%
   PM Peak Hour: T = 0.49 (X); Enter = 22%; Exit = 78%
6. ITE land use category 710 – General Office Building - Attached (Adj Streets, 7-9A, 4-6P):
   Daily: T = 3.28 (X)
   AM Peak Hour: T = 0.37 (X); Enter = 83%; Exit = 17%
   PM Peak Hour: T = 0.40 (X); Enter = 20%; Exit = 80%

Source: *Trip Generation Manual* (10th Edition), ITE, 2017; Fehr & Peers, August 2019.

Appendix C: Construction Traffic Estimates

1. DPCR CONSTRUCTION ON-ROAD TRUCK TRIP

All trips are ROUND TRIPS.

Table 1-1: Summary of Round trip Truck Trips and Duration for Reservoir Facilities

Trucks	Hours	Days*	Total Trips	Trips/ day
Concrete truck **	6,984	349	5,655	16
Dump Truck **	3,134	157	862	6
Flatbed truck **	6,315	363	1,251	4
Pickup truck **	2,664	133	264	2
Transfer dump truck and trailer ** (round trips from Tracy)	23,946	1,197	23,696	46
Worker vehicles **	24,409	880	20,341	23
Assumes a 60-mile roundtrip at 50 mph with 1.5 occupants per vehicle				

*All equipment is assumed to be utilized twenty (20) hours per day. Equipment days are not necessarily equal to calendar days.

** Utilization is primarily associated with construction vehicle material and equipment deliveries to the site and construction worker travel to the site via public roads.

Table 1-2: Round trip truck trips for Pipeline Construction

Component	Total Trips	Trips/day
Pipeline Spoil	1,984	34
Backfill for pipe	1,312	22
Pipe delivery	113	16
Tunnel excess material	1,200	3
Workers	2,400	20

Table 1-3: Round trip truck trips for Pumping Plant Construction

Component	Total Trips	Trips/day
Spoil from pump station	530	18
Backfill for pump station	650	22
Materials delivery (over 3 months)	50	1
Concrete trucks*	125	10
Workers		20

* Concrete pours would occur intermittently and could require up to 10 trips per day

Table 1-4: Trucks for Construction of Roadway Alternative 1

Equipment Type	Estimated Number Used (per day)	Estimated Duration within a Day (Hours total when used for work item)	Estimated Total Number of Working Days of Use During Entire Construction
Highway legal dump truck	8	10	100
Concrete Truck	10	8	30
Workers	20		650

Table 1-5: Equipment and Duration for Relocation of Petroleum Pipeline

Equipment Type	Estimated Number Used	Duration
Double transfer trailer rigs	3 delivery loads per day	3 days
Flatbed trucks for pipe delivery	250 loads	1 week
Workers	20	6 months

Table 1-6: Transmission Line Relocation Round trips

Equipment Type	Total Trips	Duration	Trips/day
Trucks for material delivery	50	6 months	1-2
Workers		6 months	8-20
Worker trips vary from 4 to 20/day depending on phase of work – 8 workers in two crews for tower work. 20 workers for conductor stringing after completion of towers.			

Appendix D: Level of Service Calculations

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	38	223	0	0	98	367	1	0	80	0	0	0
Future Vol, veh/h	38	223	0	0	98	367	1	0	80	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	42	245	0	0	108	403	1	0	88	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	511	0	-	-	-	0	639	840	245
Stage 1	-	-	-	-	-	-	329	329	-
Stage 2	-	-	-	-	-	-	310	511	-
Critical Hdwy	4.13	-	-	-	-	-	6.43	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.43	5.53	-
Follow-up Hdwy	2.227	-	-	-	-	-	3.527	4.027	3.327
Pot Cap-1 Maneuver	1049	-	0	0	-	-	439	300	791
Stage 1	-	-	0	0	-	-	727	645	-
Stage 2	-	-	0	0	-	-	741	535	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1049	-	-	-	-	-	419	0	791
Mov Cap-2 Maneuver	-	-	-	-	-	-	419	0	-
Stage 1	-	-	-	-	-	-	694	0	-
Stage 2	-	-	-	-	-	-	741	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.2	0	10.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	782	1049	-	-	-
HCM Lane V/C Ratio	0.114	0.04	-	-	-
HCM Control Delay (s)	10.2	8.6	0	-	-
HCM Lane LOS	B	A	A	-	-
HCM 95th %tile Q(veh)	0.4	0.1	-	-	-

Intersection	
Int Delay, s/veh	7.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	105	3	80	19	0	0	0	0	156	1	6
Future Vol, veh/h	0	105	3	80	19	0	0	0	0	156	1	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	115	3	88	21	0	0	0	0	171	1	7

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	118	0	0				314	315	21
Stage 1	-	-	-	-	-	-				197	197	-
Stage 2	-	-	-	-	-	-				117	118	-
Critical Hdwy	-	-	-	4.13	-	-				6.43	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-				5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.43	5.53	-
Follow-up Hdwy	-	-	-	2.227	-	-				3.527	4.027	3.327
Pot Cap-1 Maneuver	0	-	-	1464	-	0				677	599	1054
Stage 1	0	-	-	-	-	0				834	736	-
Stage 2	0	-	-	-	-	0				906	796	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1464	-	-				636	0	1054
Mov Cap-2 Maneuver	-	-	-	-	-	-				636	0	-
Stage 1	-	-	-	-	-	-				834	0	-
Stage 2	-	-	-	-	-	-				851	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	6.2	12.7
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	1464	-	645
HCM Lane V/C Ratio	-	-	0.06	-	0.278
HCM Control Delay (s)	-	-	7.6	0	12.7
HCM Lane LOS	-	-	A	A	B
HCM 95th %tile Q(veh)	-	-	0.2	-	1.1

Intersection						
Int Delay, s/veh	0.6					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	100	20	5	8	0
Future Vol, veh/h	0	100	20	5	8	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	0	110	22	5	9	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	27	0	-	0	135	25
Stage 1	-	-	-	-	25	-
Stage 2	-	-	-	-	110	-
Critical Hdwy	4.13	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.227	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	1580	-	-	-	856	1048
Stage 1	-	-	-	-	995	-
Stage 2	-	-	-	-	912	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1580	-	-	-	856	1048
Mov Cap-2 Maneuver	-	-	-	-	856	-
Stage 1	-	-	-	-	995	-
Stage 2	-	-	-	-	912	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1580	-	-	-	856
HCM Lane V/C Ratio	-	-	-	-	0.01
HCM Control Delay (s)	0	-	-	-	9.2
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	546	0	0	158	258	4	0	143	0	0	0
Future Vol, veh/h	7	546	0	0	158	258	4	0	143	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	7	569	0	0	165	269	4	0	149	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	434	0	-	-	-	0	883	1017	569
Stage 1	-	-	-	-	-	-	583	583	-
Stage 2	-	-	-	-	-	-	300	434	-
Critical Hdwy	4.13	-	-	-	-	-	6.43	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.43	5.53	-
Follow-up Hdwy	2.227	-	-	-	-	-	3.527	4.027	3.327
Pot Cap-1 Maneuver	1120	-	0	0	-	-	315	237	520
Stage 1	-	-	0	0	-	-	556	497	-
Stage 2	-	-	0	0	-	-	749	579	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1120	-	-	-	-	-	312	0	520
Mov Cap-2 Maneuver	-	-	-	-	-	-	312	0	-
Stage 1	-	-	-	-	-	-	551	0	-
Stage 2	-	-	-	-	-	-	749	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0.1	0	15
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	511	1120	-	-	-
HCM Lane V/C Ratio	0.3	0.007	-	-	-
HCM Control Delay (s)	15	8.2	0	-	-
HCM Lane LOS	C	A	A	-	-
HCM 95th %tile Q(veh)	1.2	0	-	-	-

Intersection	
Int Delay, s/veh	31

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	40	0	106	56	0	0	0	0	513	1	37
Future Vol, veh/h	0	40	0	106	56	0	0	0	0	513	1	37
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	42	0	110	58	0	0	0	0	534	1	39

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	42	0	0				320	320	58
Stage 1	-	-	-	-	-	-				278	278	-
Stage 2	-	-	-	-	-	-				42	42	-
Critical Hdwy	-	-	-	4.13	-	-				6.43	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-				5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.43	5.53	-
Follow-up Hdwy	-	-	-	2.227	-	-				3.527	4.027	3.327
Pot Cap-1 Maneuver	0	-	-	1561	-	0				671	595	1005
Stage 1	0	-	-	-	-	0				767	679	-
Stage 2	0	-	-	-	-	0				978	858	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1561	-	-				622	0	1005
Mov Cap-2 Maneuver	-	-	-	-	-	-				622	0	-
Stage 1	-	-	-	-	-	-				767	0	-
Stage 2	-	-	-	-	-	-				907	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	4.9	40.9
HCM LOS			E

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	1561	-	638
HCM Lane V/C Ratio	-	-	0.071	-	0.9
HCM Control Delay (s)	-	-	7.5	0	40.9
HCM Lane LOS	-	-	A	A	E
HCM 95th %tile Q(veh)	-	-	0.2	-	11.2

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	32	84	9	8	0
Future Vol, veh/h	0	32	84	9	8	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	0	33	88	9	8	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	97	0	-	0	126	93
Stage 1	-	-	-	-	93	-
Stage 2	-	-	-	-	33	-
Critical Hdwy	4.13	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.227	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	1490	-	-	-	866	961
Stage 1	-	-	-	-	928	-
Stage 2	-	-	-	-	987	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1490	-	-	-	866	961
Mov Cap-2 Maneuver	-	-	-	-	866	-
Stage 1	-	-	-	-	928	-
Stage 2	-	-	-	-	987	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1490	-	-	-	866
HCM Lane V/C Ratio	-	-	-	-	0.01
HCM Control Delay (s)	0	-	-	-	9.2
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	38	223	0	0	98	367	1	0	80	0	0	0
Future Vol, veh/h	38	223	0	0	98	367	1	0	80	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	42	245	0	0	108	403	1	0	88	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	511	0	-	-	-	0	639	840	245
Stage 1	-	-	-	-	-	-	329	329	-
Stage 2	-	-	-	-	-	-	310	511	-
Critical Hdwy	4.13	-	-	-	-	-	6.43	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.43	5.53	-
Follow-up Hdwy	2.227	-	-	-	-	-	3.527	4.027	3.327
Pot Cap-1 Maneuver	1049	-	0	0	-	-	439	300	791
Stage 1	-	-	0	0	-	-	727	645	-
Stage 2	-	-	0	0	-	-	741	535	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1049	-	-	-	-	-	419	0	791
Mov Cap-2 Maneuver	-	-	-	-	-	-	419	0	-
Stage 1	-	-	-	-	-	-	694	0	-
Stage 2	-	-	-	-	-	-	741	0	-

Approach	EB			WB			NB
HCM Control Delay, s	1.2			0			10.2
HCM LOS							B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	782	1049	-	-	-
HCM Lane V/C Ratio	0.114	0.04	-	-	-
HCM Control Delay (s)	10.2	8.6	0	-	-
HCM Lane LOS	B	A	A	-	-
HCM 95th %tile Q(veh)	0.4	0.1	-	-	-

Intersection	
Int Delay, s/veh	7.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	105	3	80	19	0	0	0	0	156	1	6
Future Vol, veh/h	0	105	3	80	19	0	0	0	0	156	1	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	115	3	88	21	0	0	0	0	171	1	7

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	118	0	0				314	315	21
Stage 1	-	-	-	-	-	-				197	197	-
Stage 2	-	-	-	-	-	-				117	118	-
Critical Hdwy	-	-	-	4.13	-	-				6.43	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-				5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.43	5.53	-
Follow-up Hdwy	-	-	-	2.227	-	-				3.527	4.027	3.327
Pot Cap-1 Maneuver	0	-	-	1464	-	0				677	599	1054
Stage 1	0	-	-	-	-	0				834	736	-
Stage 2	0	-	-	-	-	0				906	796	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1464	-	-				636	0	1054
Mov Cap-2 Maneuver	-	-	-	-	-	-				636	0	-
Stage 1	-	-	-	-	-	-				834	0	-
Stage 2	-	-	-	-	-	-				851	0	-

Approach	EB			WB						SB		
HCM Control Delay, s	0			6.2						12.7		
HCM LOS										B		

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	1464	-	645
HCM Lane V/C Ratio	-	-	0.06	-	0.278
HCM Control Delay (s)	-	-	7.6	0	12.7
HCM Lane LOS	-	-	A	A	B
HCM 95th %tile Q(veh)	-	-	0.2	-	1.1

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	0	0	100	20	5
Future Vol, veh/h	8	0	0	100	20	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	0	0	109	22	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	134	25	27	0	-	0
Stage 1	25	-	-	-	-	-
Stage 2	109	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	860	1051	1587	-	-	-
Stage 1	998	-	-	-	-	-
Stage 2	916	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	860	1051	1587	-	-	-
Mov Cap-2 Maneuver	860	-	-	-	-	-
Stage 1	998	-	-	-	-	-
Stage 2	916	-	-	-	-	-

Approach	EB		NB		SB	
HCM Control Delay, s	9.2		0		0	
HCM LOS	A					

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1587	-	860	-	-
HCM Lane V/C Ratio	-	-	0.01	-	-
HCM Control Delay (s)	0	-	9.2	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	100	20	5	8	0
Future Vol, veh/h	0	100	20	5	8	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	109	22	5	9	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	27	0	-	0	134	25
Stage 1	-	-	-	-	25	-
Stage 2	-	-	-	-	109	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1587	-	-	-	860	1051
Stage 1	-	-	-	-	998	-
Stage 2	-	-	-	-	916	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1587	-	-	-	860	1051
Mov Cap-2 Maneuver	-	-	-	-	860	-
Stage 1	-	-	-	-	998	-
Stage 2	-	-	-	-	916	-

Approach	EB		WB		SB	
HCM Control Delay, s	0		0		9.2	
HCM LOS					A	

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1587	-	-	-	860
HCM Lane V/C Ratio	-	-	-	-	0.01
HCM Control Delay (s)	0	-	-	-	9.2
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	546	0	0	158	258	4	0	143	0	0	0
Future Vol, veh/h	7	546	0	0	158	258	4	0	143	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	7	569	0	0	165	269	4	0	149	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	434	0	-	-	-	0	883	1017	569
Stage 1	-	-	-	-	-	-	583	583	-
Stage 2	-	-	-	-	-	-	300	434	-
Critical Hdwy	4.13	-	-	-	-	-	6.43	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.43	5.53	-
Follow-up Hdwy	2.227	-	-	-	-	-	3.527	4.027	3.327
Pot Cap-1 Maneuver	1120	-	0	0	-	-	315	237	520
Stage 1	-	-	0	0	-	-	556	497	-
Stage 2	-	-	0	0	-	-	749	579	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1120	-	-	-	-	-	312	0	520
Mov Cap-2 Maneuver	-	-	-	-	-	-	312	0	-
Stage 1	-	-	-	-	-	-	551	0	-
Stage 2	-	-	-	-	-	-	749	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0.1	0	15
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	511	1120	-	-	-
HCM Lane V/C Ratio	0.3	0.007	-	-	-
HCM Control Delay (s)	15	8.2	0	-	-
HCM Lane LOS	C	A	A	-	-
HCM 95th %tile Q(veh)	1.2	0	-	-	-

Intersection	
Int Delay, s/veh	31

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	40	0	106	56	0	0	0	0	513	1	37
Future Vol, veh/h	0	40	0	106	56	0	0	0	0	513	1	37
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	42	0	110	58	0	0	0	0	534	1	39

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	42	0	0				320	320	58
Stage 1	-	-	-	-	-	-				278	278	-
Stage 2	-	-	-	-	-	-				42	42	-
Critical Hdwy	-	-	-	4.13	-	-				6.43	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-				5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.43	5.53	-
Follow-up Hdwy	-	-	-	2.227	-	-				3.527	4.027	3.327
Pot Cap-1 Maneuver	0	-	-	1561	-	0				671	595	1005
Stage 1	0	-	-	-	-	0				767	679	-
Stage 2	0	-	-	-	-	0				978	858	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1561	-	-				622	0	1005
Mov Cap-2 Maneuver	-	-	-	-	-	-				622	0	-
Stage 1	-	-	-	-	-	-				767	0	-
Stage 2	-	-	-	-	-	-				907	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	4.9	40.9
HCM LOS			E

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	1561	-	638
HCM Lane V/C Ratio	-	-	0.071	-	0.9
HCM Control Delay (s)	-	-	7.5	0	40.9
HCM Lane LOS	-	-	A	A	E
HCM 95th %tile Q(veh)	-	-	0.2	-	11.2

Intersection						
Int Delay, s/veh	0.6					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	0	0	32	84	9
Future Vol, veh/h	8	0	0	32	84	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	0	0	35	91	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	131	96	101	0	-	0
Stage 1	96	-	-	-	-	-
Stage 2	35	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	863	960	1491	-	-	-
Stage 1	928	-	-	-	-	-
Stage 2	987	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	863	960	1491	-	-	-
Mov Cap-2 Maneuver	863	-	-	-	-	-
Stage 1	928	-	-	-	-	-
Stage 2	987	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1491	-	863	-	-
HCM Lane V/C Ratio	-	-	0.01	-	-
HCM Control Delay (s)	0	-	9.2	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	32	84	9	8	0
Future Vol, veh/h	0	32	84	9	8	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	35	91	10	9	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	101	0	-	0	131	96
Stage 1	-	-	-	-	96	-
Stage 2	-	-	-	-	35	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1491	-	-	-	863	960
Stage 1	-	-	-	-	928	-
Stage 2	-	-	-	-	987	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1491	-	-	-	863	960
Mov Cap-2 Maneuver	-	-	-	-	863	-
Stage 1	-	-	-	-	928	-
Stage 2	-	-	-	-	987	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1491	-	-	-	863
HCM Lane V/C Ratio	-	-	-	-	0.01
HCM Control Delay (s)	0	-	-	-	9.2
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	46	294	0	0	163	430	3	0	99	0	0	0
Future Vol, veh/h	46	294	0	0	163	430	3	0	99	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	51	323	0	0	179	473	3	0	109	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	652	0	-	-	-	0	841	1077	323
Stage 1	-	-	-	-	-	-	425	425	-
Stage 2	-	-	-	-	-	-	416	652	-
Critical Hdwy	4.13	-	-	-	-	-	6.43	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.43	5.53	-
Follow-up Hdwy	2.227	-	-	-	-	-	3.527	4.027	3.327
Pot Cap-1 Maneuver	930	-	0	0	-	-	334	218	716
Stage 1	-	-	0	0	-	-	657	585	-
Stage 2	-	-	0	0	-	-	664	463	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	930	-	-	-	-	-	312	0	716
Mov Cap-2 Maneuver	-	-	-	-	-	-	312	0	-
Stage 1	-	-	-	-	-	-	613	0	-
Stage 2	-	-	-	-	-	-	664	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.2	0	11.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	690	930	-	-	-
HCM Lane V/C Ratio	0.162	0.054	-	-	-
HCM Control Delay (s)	11.2	9.1	0	-	-
HCM Lane LOS	B	A	A	-	-
HCM 95th %tile Q(veh)	0.6	0.2	-	-	-

Intersection	
Int Delay, s/veh	8.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	142	5	111	55	0	0	0	0	197	3	9
Future Vol, veh/h	0	142	5	111	55	0	0	0	0	197	3	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	156	5	122	60	0	0	0	0	216	3	10

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	161	0	0				463	465	60
Stage 1	-	-	-	-	-	-				304	304	-
Stage 2	-	-	-	-	-	-				159	161	-
Critical Hdwy	-	-	-	4.13	-	-				6.43	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-				5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.43	5.53	-
Follow-up Hdwy	-	-	-	2.227	-	-				3.527	4.027	3.327
Pot Cap-1 Maneuver	0	-	-	1412	-	0				555	493	1003
Stage 1	0	-	-	-	-	0				746	661	-
Stage 2	0	-	-	-	-	0				867	763	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1412	-	-				506	0	1003
Mov Cap-2 Maneuver	-	-	-	-	-	-				506	0	-
Stage 1	-	-	-	-	-	-				746	0	-
Stage 2	-	-	-	-	-	-				790	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	5.2	17.4
HCM LOS			C

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	1412	-	517
HCM Lane V/C Ratio	-	-	0.086	-	0.444
HCM Control Delay (s)	-	-	7.8	0	17.4
HCM Lane LOS	-	-	A	A	C
HCM 95th %tile Q(veh)	-	-	0.3	-	2.3

Intersection						
Int Delay, s/veh	0.9					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	131	51	13	16	2
Future Vol, veh/h	2	131	51	13	16	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	2	144	56	14	18	2

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	70	0	-	0	211	63
Stage 1	-	-	-	-	63	-
Stage 2	-	-	-	-	148	-
Critical Hdwy	4.13	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.227	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	1524	-	-	-	775	999
Stage 1	-	-	-	-	957	-
Stage 2	-	-	-	-	877	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1524	-	-	-	774	999
Mov Cap-2 Maneuver	-	-	-	-	774	-
Stage 1	-	-	-	-	956	-
Stage 2	-	-	-	-	877	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1524	-	-	-	794
HCM Lane V/C Ratio	0.001	-	-	-	0.025
HCM Control Delay (s)	7.4	0	-	-	9.7
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	647	0	0	204	299	5	0	176	0	0	0
Future Vol, veh/h	12	647	0	0	204	299	5	0	176	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	13	674	0	0	213	311	5	0	183	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	524	0	-	-	-	0	1069	1224	674
Stage 1	-	-	-	-	-	-	700	700	-
Stage 2	-	-	-	-	-	-	369	524	-
Critical Hdwy	4.13	-	-	-	-	-	6.43	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.43	5.53	-
Follow-up Hdwy	2.227	-	-	-	-	-	3.527	4.027	3.327
Pot Cap-1 Maneuver	1038	-	0	0	-	-	244	178	453
Stage 1	-	-	0	0	-	-	491	440	-
Stage 2	-	-	0	0	-	-	697	528	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1038	-	-	-	-	-	239	0	453
Mov Cap-2 Maneuver	-	-	-	-	-	-	239	0	-
Stage 1	-	-	-	-	-	-	481	0	-
Stage 2	-	-	-	-	-	-	697	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0.2	0	19.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	442	1038	-	-	-
HCM Lane V/C Ratio	0.427	0.012	-	-	-
HCM Control Delay (s)	19.1	8.5	0	-	-
HCM Lane LOS	C	A	A	-	-
HCM 95th %tile Q(veh)	2.1	0	-	-	-

Intersection	
Int Delay, s/veh	90.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	80	2	126	83	0	0	0	0	579	1	47
Future Vol, veh/h	0	80	2	126	83	0	0	0	0	579	1	47
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	83	2	131	86	0	0	0	0	603	1	49

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	85	0	0				432	433	86
Stage 1	-	-	-	-	-	-				348	348	-
Stage 2	-	-	-	-	-	-				84	85	-
Critical Hdwy	-	-	-	4.13	-	-				6.43	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-				5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.43	5.53	-
Follow-up Hdwy	-	-	-	2.227	-	-				3.527	4.027	3.327
Pot Cap-1 Maneuver	0	-	-	1505	-	0				~ 579	514	970
Stage 1	0	-	-	-	-	0				713	632	-
Stage 2	0	-	-	-	-	0				937	822	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1505	-	-				~ 526	0	970
Mov Cap-2 Maneuver	-	-	-	-	-	-				~ 526	0	-
Stage 1	-	-	-	-	-	-				713	0	-
Stage 2	-	-	-	-	-	-				852	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	4.6	130.8
HCM LOS			F

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	1505	-	545
HCM Lane V/C Ratio	-	-	0.087	-	1.198
HCM Control Delay (s)	-	-	7.6	0	130.8
HCM Lane LOS	-	-	A	A	F
HCM 95th %tile Q(veh)	-	-	0.3	-	23.8

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	67	116	14	16	2
Future Vol, veh/h	2	67	116	14	16	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	2	70	121	15	17	2

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	136	0	-	0	203	129
Stage 1	-	-	-	-	129	-
Stage 2	-	-	-	-	74	-
Critical Hdwy	4.13	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.227	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	1442	-	-	-	783	918
Stage 1	-	-	-	-	894	-
Stage 2	-	-	-	-	946	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1442	-	-	-	782	918
Mov Cap-2 Maneuver	-	-	-	-	782	-
Stage 1	-	-	-	-	893	-
Stage 2	-	-	-	-	946	-

Approach	EB		WB		SB	
HCM Control Delay, s	0.2		0		9.6	
HCM LOS					A	

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1442	-	-	-	795
HCM Lane V/C Ratio	0.001	-	-	-	0.024
HCM Control Delay (s)	7.5	0	-	-	9.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	77	299	0	0	174	430	19	0	99	0	0	0
Future Vol, veh/h	77	299	0	0	174	430	19	0	99	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	85	329	0	0	191	473	21	0	109	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	664	0	-	-	-	0	927	1163	329
Stage 1	-	-	-	-	-	-	499	499	-
Stage 2	-	-	-	-	-	-	428	664	-
Critical Hdwy	4.13	-	-	-	-	-	6.43	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.43	5.53	-
Follow-up Hdwy	2.227	-	-	-	-	-	3.527	4.027	3.327
Pot Cap-1 Maneuver	920	-	0	0	-	-	297	194	710
Stage 1	-	-	0	0	-	-	608	542	-
Stage 2	-	-	0	0	-	-	655	457	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	920	-	-	-	-	-	263	0	710
Mov Cap-2 Maneuver	-	-	-	-	-	-	263	0	-
Stage 1	-	-	-	-	-	-	539	0	-
Stage 2	-	-	-	-	-	-	655	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.9	0	13.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	557	920	-	-	-
HCM Lane V/C Ratio	0.233	0.092	-	-	-
HCM Control Delay (s)	13.4	9.3	0	-	-
HCM Lane LOS	B	A	A	-	-
HCM 95th %tile Q(veh)	0.9	0.3	-	-	-

Intersection	
Int Delay, s/veh	9.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	178	14	111	82	0	0	0	0	197	3	52
Future Vol, veh/h	0	178	14	111	82	0	0	0	0	197	3	52
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	196	15	122	90	0	0	0	0	216	3	57

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	211	0	0				538	545	90
Stage 1	-	-	-	-	-	-				334	334	-
Stage 2	-	-	-	-	-	-				204	211	-
Critical Hdwy	-	-	-	4.13	-	-				6.43	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-				5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.43	5.53	-
Follow-up Hdwy	-	-	-	2.227	-	-				3.527	4.027	3.327
Pot Cap-1 Maneuver	0	-	-	1354	-	0				502	444	965
Stage 1	0	-	-	-	-	0				723	641	-
Stage 2	0	-	-	-	-	0				828	726	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1354	-	-				454	0	965
Mov Cap-2 Maneuver	-	-	-	-	-	-				454	0	-
Stage 1	-	-	-	-	-	-				723	0	-
Stage 2	-	-	-	-	-	-				749	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	4.6	20.1
HCM LOS			C

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	1354	-	510
HCM Lane V/C Ratio	-	-	0.09	-	0.543
HCM Control Delay (s)	-	-	7.9	0	20.1
HCM Lane LOS	-	-	A	A	C
HCM 95th %tile Q(veh)	-	-	0.3	-	3.2

Intersection						
Int Delay, s/veh	1.9					
Movement	**EBL**	**EBT**	**WBT**	**WBR**	**SBL**	**SBR**
Lane Configurations						
Traffic Vol, veh/h	2	134	56	78	58	2
Future Vol, veh/h	2	134	56	78	58	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	2	147	62	86	64	2

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	148	0	-	0	256	105
Stage 1	-	-	-	-	105	-
Stage 2	-	-	-	-	151	-
Critical Hdwy	4.13	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.227	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	1427	-	-	-	731	947
Stage 1	-	-	-	-	917	-
Stage 2	-	-	-	-	874	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1427	-	-	-	730	947
Mov Cap-2 Maneuver	-	-	-	-	730	-
Stage 1	-	-	-	-	915	-
Stage 2	-	-	-	-	874	-
Approach	**EB**		**WB**		**SB**	
HCM Control Delay, s	0.1		0		10.4	
HCM LOS					B	

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1427	-	-	-	736
HCM Lane V/C Ratio	0.002	-	-	-	0.09
HCM Control Delay (s)	7.5	0	-	-	10.4
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	50	656	0	0	211	299	17	0	176	0	0	0
Future Vol, veh/h	50	656	0	0	211	299	17	0	176	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	52	683	0	0	220	311	18	0	183	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	531	0	-	-	-	0	1163	1318	683
Stage 1	-	-	-	-	-	-	787	787	-
Stage 2	-	-	-	-	-	-	376	531	-
Critical Hdwy	4.13	-	-	-	-	-	6.43	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.43	5.53	-
Follow-up Hdwy	2.227	-	-	-	-	-	3.527	4.027	3.327
Pot Cap-1 Maneuver	1031	-	0	0	-	-	214	157	448
Stage 1	-	-	0	0	-	-	447	401	-
Stage 2	-	-	0	0	-	-	692	524	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1031	-	-	-	-	-	197	0	448
Mov Cap-2 Maneuver	-	-	-	-	-	-	197	0	-
Stage 1	-	-	-	-	-	-	411	0	-
Stage 2	-	-	-	-	-	-	692	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0.6	0	22.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	403	1031	-	-	-
HCM Lane V/C Ratio	0.499	0.051	-	-	-
HCM Control Delay (s)	22.5	8.7	0	-	-
HCM Lane LOS	C	A	A	-	-
HCM 95th %tile Q(veh)	2.7	0.2	-	-	-

Intersection	
Int Delay, s/veh	131.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	127	15	126	102	0	0	0	0	579	1	84
Future Vol, veh/h	0	127	15	126	102	0	0	0	0	579	1	84
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	132	16	131	106	0	0	0	0	603	1	88

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	148	0	0				508	516	106
Stage 1	-	-	-	-	-	-				368	368	-
Stage 2	-	-	-	-	-	-				140	148	-
Critical Hdwy	-	-	-	4.13	-	-				6.43	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-				5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.43	5.53	-
Follow-up Hdwy	-	-	-	2.227	-	-				3.527	4.027	3.327
Pot Cap-1 Maneuver	0	-	-	1427	-	0				~ 523	461	946
Stage 1	0	-	-	-	-	0				698	620	-
Stage 2	0	-	-	-	-	0				884	773	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1427	-	-				~ 472	0	946
Mov Cap-2 Maneuver	-	-	-	-	-	-				~ 472	0	-
Stage 1	-	-	-	-	-	-				698	0	-
Stage 2	-	-	-	-	-	-				797	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	4.3	202.8
HCM LOS			F

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	1427	-	504
HCM Lane V/C Ratio	-	-	0.092	-	1.372
HCM Control Delay (s)	-	-	7.8	0	202.8
HCM Lane LOS	-	-	A	A	F
HCM 95th %tile Q(veh)	-	-	0.3	-	31.7

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	72	118	68	71	2
Future Vol, veh/h	2	72	118	68	71	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	2	75	123	71	74	2

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	194	0	-	0	238	159
Stage 1	-	-	-	-	159	-
Stage 2	-	-	-	-	79	-
Critical Hdwy	4.13	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.227	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	1373	-	-	-	748	884
Stage 1	-	-	-	-	867	-
Stage 2	-	-	-	-	942	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1373	-	-	-	747	884
Mov Cap-2 Maneuver	-	-	-	-	747	-
Stage 1	-	-	-	-	865	-
Stage 2	-	-	-	-	942	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1373	-	-	-	750
HCM Lane V/C Ratio	0.002	-	-	-	0.101
HCM Control Delay (s)	7.6	0	-	-	10.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	70	520	0	0	370	630	10	0	160	0	0	0
Future Vol, veh/h	70	520	0	0	370	630	10	0	160	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	77	571	0	0	407	692	11	0	176	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	1099	0	-	-	-	0	1478	1824	571
Stage 1	-	-	-	-	-	-	725	725	-
Stage 2	-	-	-	-	-	-	753	1099	-
Critical Hdwy	4.13	-	-	-	-	-	6.43	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.43	5.53	-
Follow-up Hdwy	2.227	-	-	-	-	-	3.527	4.027	3.327
Pot Cap-1 Maneuver	631	-	0	0	-	-	138	77	518
Stage 1	-	-	0	0	-	-	478	428	-
Stage 2	-	-	0	0	-	-	463	287	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	631	-	-	-	-	-	113	0	518
Mov Cap-2 Maneuver	-	-	-	-	-	-	113	0	-
Stage 1	-	-	-	-	-	-	392	0	-
Stage 2	-	-	-	-	-	-	463	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.4	0	19.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	428	631	-	-	-
HCM Lane V/C Ratio	0.436	0.122	-	-	-
HCM Control Delay (s)	19.8	11.5	0	-	-
HCM Lane LOS	C	B	A	-	-
HCM 95th %tile Q(veh)	2.2	0.4	-	-	-

Intersection	
Int Delay, s/veh	124

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	260	10	210	170	0	0	0	0	330	10	20
Future Vol, veh/h	0	260	10	210	170	0	0	0	0	330	10	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	286	11	231	187	0	0	0	0	363	11	22

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	297	0	0				941	946	187
Stage 1	-	-	-	-	-	-				649	649	-
Stage 2	-	-	-	-	-	-				292	297	-
Critical Hdwy	-	-	-	4.13	-	-				6.43	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-				5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.43	5.53	-
Follow-up Hdwy	-	-	-	2.227	-	-				3.527	4.027	3.327
Pot Cap-1 Maneuver	0	-	-	1259	-	0				~ 291	260	852
Stage 1	0	-	-	-	-	0				518	464	-
Stage 2	0	-	-	-	-	0				756	666	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1259	-	-				~ 231	0	852
Mov Cap-2 Maneuver	-	-	-	-	-	-				~ 231	0	-
Stage 1	-	-	-	-	-	-				518	0	-
Stage 2	-	-	-	-	-	-				601	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	4.7	$ 342.8
HCM LOS			F

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	1259	-	241
HCM Lane V/C Ratio	-	-	0.183	-	1.642
HCM Control Delay (s)	-	-	8.5	0	$ 342.8
HCM Lane LOS	-	-	A	A	F
HCM 95th %tile Q(veh)	-	-	0.7	-	25.2

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	230	150	40	40	10
Future Vol, veh/h	10	230	150	40	40	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	11	253	165	44	44	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	209	0	-	0	462	187
Stage 1	-	-	-	-	187	-
Stage 2	-	-	-	-	275	-
Critical Hdwy	4.13	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.227	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	1356	-	-	-	556	852
Stage 1	-	-	-	-	843	-
Stage 2	-	-	-	-	769	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1356	-	-	-	551	852
Mov Cap-2 Maneuver	-	-	-	-	551	-
Stage 1	-	-	-	-	835	-
Stage 2	-	-	-	-	769	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	11.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1356	-	-	-	593
HCM Lane V/C Ratio	0.008	-	-	-	0.093
HCM Control Delay (s)	7.7	0	-	-	11.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Intersection	
Int Delay, s/veh	18.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	970	0	0	350	430	10	0	280	0	0	0
Future Vol, veh/h	30	970	0	0	350	430	10	0	280	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	31	1010	0	0	365	448	10	0	292	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	813	0	-	-	-	0	1661	1885	1010
Stage 1	-	-	-	-	-	-	1072	1072	-
Stage 2	-	-	-	-	-	-	589	813	-
Critical Hdwy	4.13	-	-	-	-	-	6.43	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.43	5.53	-
Follow-up Hdwy	2.227	-	-	-	-	-	3.527	4.027	3.327
Pot Cap-1 Maneuver	809	-	0	0	-	-	106	70	~ 290
Stage 1	-	-	0	0	-	-	327	296	-
Stage 2	-	-	0	0	-	-	553	390	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	809	-	-	-	-	-	97	0	~ 290
Mov Cap-2 Maneuver	-	-	-	-	-	-	97	0	-
Stage 1	-	-	-	-	-	-	299	0	-
Stage 2	-	-	-	-	-	-	553	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0.3	0	129.7
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	271	809	-	-	-
HCM Lane V/C Ratio	1.115	0.039	-	-	-
HCM Control Delay (s)	129.7	9.6	0	-	-
HCM Lane LOS	F	A	A	-	-
HCM 95th %tile Q(veh)	12.8	0.1	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	528

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	210	10	190	170	0	0	0	0	790	0	80
Future Vol, veh/h	0	210	10	190	170	0	0	0	0	790	0	80
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	219	10	198	177	0	0	0	0	823	0	83

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	229	0	0				797	802	177
Stage 1	-	-	-	-	-	-				573	573	-
Stage 2	-	-	-	-	-	-				224	229	-
Critical Hdwy	-	-	-	4.13	-	-				6.43	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-				5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.43	5.53	-
Follow-up Hdwy	-	-	-	2.227	-	-				3.527	4.027	3.327
Pot Cap-1 Maneuver	0	-	-	1333	-	0				~ 354	316	863
Stage 1	0	-	-	-	-	0				~ 562	502	-
Stage 2	0	-	-	-	-	0				~ 811	713	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1333	-	-				~ 296	0	863
Mov Cap-2 Maneuver	-	-	-	-	-	-				~ 296	0	-
Stage 1	-	-	-	-	-	-				~ 562	0	-
Stage 2	-	-	-	-	-	-				~ 677	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	4.3	$ 878.2
HCM LOS			F

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	1333	-	315
HCM Lane V/C Ratio	-	-	0.148	-	2.877
HCM Control Delay (s)	-	-	8.2	0	$ 878.2
HCM Lane LOS	-	-	A	A	F
HCM 95th %tile Q(veh)	-	-	0.5	-	78.2

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	180	220	30	40	10
Future Vol, veh/h	10	180	220	30	40	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	10	188	229	31	42	10

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	260	0	-	0	453	245
Stage 1	-	-	-	-	245	-
Stage 2	-	-	-	-	208	-
Critical Hdwy	4.13	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.227	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	1299	-	-	-	563	791
Stage 1	-	-	-	-	793	-
Stage 2	-	-	-	-	824	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1299	-	-	-	558	791
Mov Cap-2 Maneuver	-	-	-	-	558	-
Stage 1	-	-	-	-	786	-
Stage 2	-	-	-	-	824	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	11.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1299	-	-	-	593
HCM Lane V/C Ratio	0.008	-	-	-	0.088
HCM Control Delay (s)	7.8	0	-	-	11.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	70	520	0	0	370	630	10	0	160	0	0	0
Future Vol, veh/h	70	520	0	0	370	630	10	0	160	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	77	571	0	0	407	692	11	0	176	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	1099	0	-	-	-	0	1478	1824	571
Stage 1	-	-	-	-	-	-	725	725	-
Stage 2	-	-	-	-	-	-	753	1099	-
Critical Hdwy	4.13	-	-	-	-	-	6.43	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.43	5.53	-
Follow-up Hdwy	2.227	-	-	-	-	-	3.527	4.027	3.327
Pot Cap-1 Maneuver	631	-	0	0	-	-	138	77	518
Stage 1	-	-	0	0	-	-	478	428	-
Stage 2	-	-	0	0	-	-	463	287	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	631	-	-	-	-	-	113	0	518
Mov Cap-2 Maneuver	-	-	-	-	-	-	113	0	-
Stage 1	-	-	-	-	-	-	392	0	-
Stage 2	-	-	-	-	-	-	463	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.4	0	19.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	428	631	-	-	-
HCM Lane V/C Ratio	0.436	0.122	-	-	-
HCM Control Delay (s)	19.8	11.5	0	-	-
HCM Lane LOS	C	B	A	-	-
HCM 95th %tile Q(veh)	2.2	0.4	-	-	-

Intersection	
Int Delay, s/veh	124

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	260	10	210	170	0	0	0	0	330	10	20
Future Vol, veh/h	0	260	10	210	170	0	0	0	0	330	10	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	286	11	231	187	0	0	0	0	363	11	22

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	297	0	0				941	946	187
Stage 1	-	-	-	-	-	-				649	649	-
Stage 2	-	-	-	-	-	-				292	297	-
Critical Hdwy	-	-	-	4.13	-	-				6.43	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-				5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.43	5.53	-
Follow-up Hdwy	-	-	-	2.227	-	-				3.527	4.027	3.327
Pot Cap-1 Maneuver	0	-	-	1259	-	0				~ 291	260	852
Stage 1	0	-	-	-	-	0				518	464	-
Stage 2	0	-	-	-	-	0				756	666	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1259	-	-				~ 231	0	852
Mov Cap-2 Maneuver	-	-	-	-	-	-				~ 231	0	-
Stage 1	-	-	-	-	-	-				518	0	-
Stage 2	-	-	-	-	-	-				601	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	4.7	$ 342.8
HCM LOS			F

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	1259	-	241
HCM Lane V/C Ratio	-	-	0.183	-	1.642
HCM Control Delay (s)	-	-	8.5	0	$ 342.8
HCM Lane LOS	-	-	A	A	F
HCM 95th %tile Q(veh)	-	-	0.7	-	25.2

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection						
Int Delay, s/veh	1.4					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	40	10	10	230	150	40
Future Vol, veh/h	40	10	10	230	150	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	11	11	250	163	43

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	457	185	206	0	-	0
Stage 1	185	-	-	-	-	-
Stage 2	272	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	562	857	1365	-	-	-
Stage 1	847	-	-	-	-	-
Stage 2	774	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	557	857	1365	-	-	-
Mov Cap-2 Maneuver	557	-	-	-	-	-
Stage 1	839	-	-	-	-	-
Stage 2	774	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.6	0.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1365	-	599	-	-
HCM Lane V/C Ratio	0.008	-	0.091	-	-
HCM Control Delay (s)	7.7	0	11.6	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	230	150	40	40	10
Future Vol, veh/h	10	230	150	40	40	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	250	163	43	43	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	206	0	-	0	457	185
Stage 1	-	-	-	-	185	-
Stage 2	-	-	-	-	272	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1365	-	-	-	562	857
Stage 1	-	-	-	-	847	-
Stage 2	-	-	-	-	774	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1365	-	-	-	557	857
Mov Cap-2 Maneuver	-	-	-	-	557	-
Stage 1	-	-	-	-	839	-
Stage 2	-	-	-	-	774	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	11.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1365	-	-	-	599
HCM Lane V/C Ratio	0.008	-	-	-	0.091
HCM Control Delay (s)	7.7	0	-	-	11.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Intersection	
Int Delay, s/veh	18.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	970	0	0	350	430	10	0	280	0	0	0
Future Vol, veh/h	30	970	0	0	350	430	10	0	280	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	31	1010	0	0	365	448	10	0	292	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	813	0	-	-	-	0	1661	1885	1010
Stage 1	-	-	-	-	-	-	1072	1072	-
Stage 2	-	-	-	-	-	-	589	813	-
Critical Hdwy	4.13	-	-	-	-	-	6.43	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.43	5.53	-
Follow-up Hdwy	2.227	-	-	-	-	-	3.527	4.027	3.327
Pot Cap-1 Maneuver	809	-	0	0	-	-	106	70	~ 290
Stage 1	-	-	0	0	-	-	327	296	-
Stage 2	-	-	0	0	-	-	553	390	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	809	-	-	-	-	-	97	0	~ 290
Mov Cap-2 Maneuver	-	-	-	-	-	-	97	0	-
Stage 1	-	-	-	-	-	-	299	0	-
Stage 2	-	-	-	-	-	-	553	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0.3	0	129.7
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	271	809	-	-	-
HCM Lane V/C Ratio	1.115	0.039	-	-	-
HCM Control Delay (s)	129.7	9.6	0	-	-
HCM Lane LOS	F	A	A	-	-
HCM 95th %tile Q(veh)	12.8	0.1	-	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s   +: Computation Not Defined   *: All major volume in platoon

Intersection	
Int Delay, s/veh	528

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	210	10	190	170	0	0	0	0	790	0	80
Future Vol, veh/h	0	210	10	190	170	0	0	0	0	790	0	80
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	219	10	198	177	0	0	0	0	823	0	83

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	229	0	0				797	802	177
Stage 1	-	-	-	-	-	-				573	573	-
Stage 2	-	-	-	-	-	-				224	229	-
Critical Hdwy	-	-	-	4.13	-	-				6.43	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-				5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.43	5.53	-
Follow-up Hdwy	-	-	-	2.227	-	-				3.527	4.027	3.327
Pot Cap-1 Maneuver	0	-	-	1333	-	0				~ 354	316	863
Stage 1	0	-	-	-	-	0				~ 562	502	-
Stage 2	0	-	-	-	-	0				~ 811	713	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1333	-	-				~ 296	0	863
Mov Cap-2 Maneuver	-	-	-	-	-	-				~ 296	0	-
Stage 1	-	-	-	-	-	-				~ 562	0	-
Stage 2	-	-	-	-	-	-				~ 677	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	4.3	$ 878.2
HCM LOS			F

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	1333	-	315
HCM Lane V/C Ratio	-	-	0.148	-	2.877
HCM Control Delay (s)	-	-	8.2	0	$ 878.2
HCM Lane LOS	-	-	A	A	F
HCM 95th %tile Q(veh)	-	-	0.5	-	78.2

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection						
Int Delay, s/veh	1.4					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	40	10	10	140	220	30
Future Vol, veh/h	40	10	10	140	220	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	11	11	152	239	33

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	430	256	272	0	-	0
Stage 1	256	-	-	-	-	-
Stage 2	174	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	582	783	1291	-	-	-
Stage 1	787	-	-	-	-	-
Stage 2	856	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	577	783	1291	-	-	-
Mov Cap-2 Maneuver	577	-	-	-	-	-
Stage 1	780	-	-	-	-	-
Stage 2	856	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.5	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1291	-	609	-	-
HCM Lane V/C Ratio	0.008	-	0.089	-	-
HCM Control Delay (s)	7.8	0	11.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	140	220	30	40	10
Future Vol, veh/h	10	140	220	30	40	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	152	239	33	43	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	272	0	-	0	430	256
Stage 1	-	-	-	-	256	-
Stage 2	-	-	-	-	174	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1291	-	-	-	582	783
Stage 1	-	-	-	-	787	-
Stage 2	-	-	-	-	856	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1291	-	-	-	577	783
Mov Cap-2 Maneuver	-	-	-	-	577	-
Stage 1	-	-	-	-	780	-
Stage 2	-	-	-	-	856	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	11.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1291	-	-	-	609
HCM Lane V/C Ratio	0.008	-	-	-	0.089
HCM Control Delay (s)	7.8	0	-	-	11.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Mitigated Level of Service Calculations

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	77	299	0	0	174	430	19	0	99	0	0	0
Future Volume (veh/h)	77	299	0	0	174	430	19	0	99	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1900	1845	0	0	1845	1845	1900	1845	1845			
Adj Flow Rate, veh/h	85	329	0	0	191	0	21	0	71			
Adj No. of Lanes	0	2	0	0	2	1	0	1	2			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	169	540	0	0	734	328	1163	0	1827			
Arrive On Green	0.07	0.07	0.00	0.00	0.21	0.00	0.66	0.00	0.66			
Sat Flow, veh/h	464	2662	0	0	3597	1568	1757	0	2760			
Grp Volume(v), veh/h	216	198	0	0	191	0	21	0	71			
Grp Sat Flow(s),veh/h/ln	1448	1595	0	0	1752	1568	1757	0	1380			
Q Serve(g_s), s	7.2	8.4	0.0	0.0	3.2	0.0	0.3	0.0	0.6			
Cycle Q Clear(g_c), s	10.4	8.4	0.0	0.0	3.2	0.0	0.3	0.0	0.6			
Prop In Lane	0.39		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	375	334	0	0	734	328	1163	0	1827			
V/C Ratio(X)	0.58	0.59	0.00	0.00	0.26	0.00	0.02	0.00	0.04			
Avail Cap(c_a), veh/h	888	877	0	0	1928	862	1163	0	1827			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.89	0.89	0.00	0.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	30.7	29.7	0.0	0.0	23.1	0.0	4.0	0.0	4.1			
Incr Delay (d2), s/veh	1.3	1.5	0.0	0.0	0.2	0.0	0.0	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.2	3.9	0.0	0.0	1.6	0.0	0.1	0.0	0.2			
LnGrp Delay(d),s/veh	31.9	31.2	0.0	0.0	23.3	0.0	4.1	0.0	4.1			
LnGrp LOS	C	C			C		A		A			
Approach Vol, veh/h		414			191			92				
Approach Delay, s/veh		31.6			23.3			4.1				
Approach LOS		C			C			A				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4				8
Phs Duration (G+Y+Rc), s		50.8		19.2				19.2
Change Period (Y+Rc), s		4.5		4.5				4.5
Max Green Setting (Gmax), s		22.5		38.5				38.5
Max Q Clear Time (g_c+I1), s		2.6		12.4				5.2
Green Ext Time (p_c), s		0.3		2.3				1.1

Intersection Summary			
HCM 2010 Ctrl Delay			25.7
HCM 2010 LOS			C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	178	14	111	82	0	0	0	0	197	3	52
Future Volume (veh/h)	0	178	14	111	82	0	0	0	0	197	3	52
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1845	1900	1845	1845	0				1845	1845	1900
Adj Flow Rate, veh/h	0	196	15	106	112	0				138	112	57
Adj No. of Lanes	0	2	0	1	1	0				1	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91				0.91	0.91	0.91
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	314	24	168	176	0				1083	711	362
Arrive On Green	0.00	0.10	0.10	0.03	0.03	0.00				0.62	0.62	0.62
Sat Flow, veh/h	0	3394	251	1757	1845	0				1757	1154	587
Grp Volume(v), veh/h	0	103	108	106	112	0				138	0	169
Grp Sat Flow(s),veh/h/ln	0	1752	1800	1757	1845	0				1757	0	1741
Q Serve(g_s), s	0.0	4.0	4.0	4.2	4.2	0.0				2.3	0.0	2.9
Cycle Q Clear(g_c), s	0.0	4.0	4.0	4.2	4.2	0.0				2.3	0.0	2.9
Prop In Lane	0.00		0.14	1.00		0.00				1.00		0.34
Lane Grp Cap(c), veh/h	0	167	171	168	176	0				1083	0	1073
V/C Ratio(X)	0.00	0.62	0.63	0.63	0.63	0.00				0.13	0.00	0.16
Avail Cap(c_a), veh/h	0	451	463	454	477	0				1083	0	1073
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.98	0.98	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	30.5	30.5	32.7	32.7	0.0				5.6	0.0	5.7
Incr Delay (d2), s/veh	0.0	3.7	3.8	3.8	3.7	0.0				0.2	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.1	2.2	2.2	2.3	0.0				1.2	0.0	1.5
LnGrp Delay(d),s/veh	0.0	34.2	34.3	36.5	36.4	0.0				5.8	0.0	6.0
LnGrp LOS		C	C	D	D					A		A
Approach Vol, veh/h		211			218						307	
Approach Delay, s/veh		34.2			36.4						5.9	
Approach LOS		C			D						A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				11.2		47.7		11.2
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				18.0		20.4		18.1
Max Q Clear Time (g_c+I1), s				6.0		4.9		6.2
Green Ext Time (p_c), s				0.7		1.1		0.6

Intersection Summary		
HCM 2010 Ctrl Delay		23.1
HCM 2010 LOS		C

Notes

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	134	56	78	58	2
Future Vol, veh/h	2	134	56	78	58	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	2	147	62	86	64	2

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	148	0	-	0	256	105
Stage 1	-	-	-	-	105	-
Stage 2	-	-	-	-	151	-
Critical Hdwy	4.13	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.227	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	1427	-	-	-	731	947
Stage 1	-	-	-	-	917	-
Stage 2	-	-	-	-	874	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1427	-	-	-	730	947
Mov Cap-2 Maneuver	-	-	-	-	730	-
Stage 1	-	-	-	-	915	-
Stage 2	-	-	-	-	874	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	10.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1427	-	-	-	736
HCM Lane V/C Ratio	0.002	-	-	-	0.09
HCM Control Delay (s)	7.5	0	-	-	10.4
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	656	0	0	211	299	17	0	176	0	0	0
Future Volume (veh/h)	50	656	0	0	211	299	17	0	176	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1900	1845	0	0	1845	1845	1900	1845	1845			
Adj Flow Rate, veh/h	52	683	0	0	220	0	18	0	83			
Adj No. of Lanes	0	2	0	0	2	1	0	1	2			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	134	984	0	0	1073	480	867	0	1363			
Arrive On Green	0.10	0.10	0.00	0.00	0.31	0.00	0.49	0.00	0.49			
Sat Flow, veh/h	141	3295	0	0	3597	1568	1757	0	2760			
Grp Volume(v), veh/h	390	345	0	0	220	0	18	0	83			
Grp Sat Flow(s),veh/h/ln	1758	1595	0	0	1752	1568	1757	0	1380			
Q Serve(g_s), s	4.3	9.4	0.0	0.0	2.1	0.0	0.2	0.0	0.7			
Cycle Q Clear(g_c), s	9.5	9.4	0.0	0.0	2.1	0.0	0.2	0.0	0.7			
Prop In Lane	0.13		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	629	488	0	0	1073	480	867	0	1363			
V/C Ratio(X)	0.62	0.71	0.00	0.00	0.20	0.00	0.02	0.00	0.06			
Avail Cap(c_a), veh/h	789	638	0	0	1402	627	867	0	1363			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.91	0.91	0.00	0.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	18.2	18.3	0.0	0.0	11.6	0.0	5.8	0.0	5.9			
Incr Delay (d2), s/veh	0.9	2.2	0.0	0.0	0.1	0.0	0.0	0.0	0.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.9	4.5	0.0	0.0	1.0	0.0	0.1	0.0	0.3			
LnGrp Delay(d),s/veh	19.1	20.5	0.0	0.0	11.6	0.0	5.9	0.0	6.0			
LnGrp LOS	B	C			B		A		A			
Approach Vol, veh/h		735			220			101				
Approach Delay, s/veh		19.8			11.6			6.0				
Approach LOS		B			B			A				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		26.7		18.3				18.3				
Change Period (Y+Rc), s		4.5		4.5				4.5				
Max Green Setting (Gmax), s		18.0		18.0				18.0				
Max Q Clear Time (g_c+I1), s		2.7		11.5				4.1				
Green Ext Time (p_c), s		0.3		2.2				1.0				
Intersection Summary												
HCM 2010 Ctrl Delay			16.8									
HCM 2010 LOS			B									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	127	15	126	102	0	0	0	0	579	1	84
Future Volume (veh/h)	0	127	15	126	102	0	0	0	0	579	1	84
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1845	1900	1845	1845	0				1845	1845	1900
Adj Flow Rate, veh/h	0	132	4	118	123	0				682	0	0
Adj No. of Lanes	0	2	0	1	1	0				2	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	215	7	166	174	0				2438	1280	0
Arrive On Green	0.00	0.06	0.06	0.09	0.09	0.00				0.69	0.00	0.00
Sat Flow, veh/h	0	3566	105	1757	1845	0				3514	1845	0
Grp Volume(v), veh/h	0	66	70	118	123	0				682	0	0
Grp Sat Flow(s),veh/h/ln	0	1752	1826	1757	1845	0				1757	1845	0
Q Serve(g_s), s	0.0	3.3	3.3	5.9	5.8	0.0				6.6	0.0	0.0
Cycle Q Clear(g_c), s	0.0	3.3	3.3	5.9	5.8	0.0				6.6	0.0	0.0
Prop In Lane	0.00		0.06	1.00		0.00				1.00		0.00
Lane Grp Cap(c), veh/h	0	109	113	166	174	0				2438	1280	0
V/C Ratio(X)	0.00	0.61	0.62	0.71	0.71	0.00				0.28	0.00	0.00
Avail Cap(c_a), veh/h	0	350	365	361	379	0				2438	1280	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.99	0.99	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	41.1	41.2	39.6	39.6	0.0				5.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	5.4	5.3	5.5	5.2	0.0				0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.8	1.9	3.1	3.2	0.0				3.3	0.0	0.0
LnGrp Delay(d),s/veh	0.0	46.6	46.5	45.1	44.7	0.0				5.5	0.0	0.0
LnGrp LOS		D	D	D	D					A		
Approach Vol, veh/h		136			241						682	
Approach Delay, s/veh		46.5			44.9						5.5	
Approach LOS		D			D						A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				10.1		66.9		13.0
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				18.0		40.0		18.5
Max Q Clear Time (g_c+I1), s				5.3		8.6		7.9
Green Ext Time (p_c), s				0.4		2.6		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	19.8
HCM 2010 LOS	B

Notes

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	72	118	68	71	2
Future Vol, veh/h	2	72	118	68	71	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	2	75	123	71	74	2

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	194	0	-	0	238	159
Stage 1	-	-	-	-	159	-
Stage 2	-	-	-	-	79	-
Critical Hdwy	4.13	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.227	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	1373	-	-	-	748	884
Stage 1	-	-	-	-	867	-
Stage 2	-	-	-	-	942	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1373	-	-	-	747	884
Mov Cap-2 Maneuver	-	-	-	-	747	-
Stage 1	-	-	-	-	865	-
Stage 2	-	-	-	-	942	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1373	-	-	-	750
HCM Lane V/C Ratio	0.002	-	-	-	0.101
HCM Control Delay (s)	7.6	0	-	-	10.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	520	0	0	370	630	10	0	160	0	0	0
Future Volume (veh/h)	70	520	0	0	370	630	10	0	160	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1900	1845	0	0	1845	1845	1900	1845	1845			
Adj Flow Rate, veh/h	77	571	0	0	407	0	11	0	97			
Adj No. of Lanes	0	2	0	0	2	1	0	1	2			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	139	853	0	0	1066	477	997	0	1565			
Arrive On Green	0.10	0.10	0.00	0.00	0.30	0.00	0.57	0.00	0.57			
Sat Flow, veh/h	249	2888	0	0	3597	1568	1757	0	2760			
Grp Volume(v), veh/h	329	319	0	0	407	0	11	0	97			
Grp Sat Flow(s),veh/h/ln	1458	1595	0	0	1752	1568	1757	0	1380			
Q Serve(g_s), s	9.2	13.5	0.0	0.0	6.4	0.0	0.2	0.0	1.1			
Cycle Q Clear(g_c), s	15.6	13.5	0.0	0.0	6.4	0.0	0.2	0.0	1.1			
Prop In Lane	0.23		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	507	485	0	0	1066	477	997	0	1565			
V/C Ratio(X)	0.65	0.66	0.00	0.00	0.38	0.00	0.01	0.00	0.06			
Avail Cap(c_a), veh/h	881	877	0	0	1928	862	997	0	1565			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.91	0.91	0.00	0.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	28.9	28.0	0.0	0.0	19.2	0.0	6.6	0.0	6.8			
Incr Delay (d2), s/veh	1.3	1.4	0.0	0.0	0.2	0.0	0.0	0.0	0.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	6.4	6.2	0.0	0.0	3.1	0.0	0.1	0.0	0.4			
LnGrp Delay(d),s/veh	30.1	29.4	0.0	0.0	19.4	0.0	6.6	0.0	6.9			
LnGrp LOS	C	C			B		A		A			
Approach Vol, veh/h		648			407			108				
Approach Delay, s/veh		29.8			19.4			6.8				
Approach LOS		C			B			A				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4				8
Phs Duration (G+Y+Rc), s		44.2		25.8				25.8
Change Period (Y+Rc), s		4.5		4.5				4.5
Max Green Setting (Gmax), s		22.5		38.5				38.5
Max Q Clear Time (g_c+I1), s		3.1		17.6				8.4
Green Ext Time (p_c), s		0.3		3.7				2.5

Intersection Summary	
HCM 2010 Ctrl Delay	24.0
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	260	10	210	170	0	0	0	0	330	10	20
Future Volume (veh/h)	0	260	10	210	170	0	0	0	0	330	10	20
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1845	1900	1845	1845	0				1845	1845	1900
Adj Flow Rate, veh/h	0	286	11	209	218	0				391	0	0
Adj No. of Lanes	0	2	0	1	1	0				2	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91				0.91	0.91	0.91
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	423	16	283	297	0				1838	965	0
Arrive On Green	0.00	0.12	0.12	0.05	0.05	0.00				0.52	0.00	0.00
Sat Flow, veh/h	0	3534	132	1757	1845	0				3514	1845	0
Grp Volume(v), veh/h	0	145	152	209	218	0				391	0	0
Grp Sat Flow(s),veh/h/ln	0	1752	1821	1757	1845	0				1757	1845	0
Q Serve(g_s), s	0.0	5.5	5.6	8.2	8.2	0.0				4.2	0.0	0.0
Cycle Q Clear(g_c), s	0.0	5.5	5.6	8.2	8.2	0.0				4.2	0.0	0.0
Prop In Lane	0.00		0.07	1.00		0.00				1.00		0.00
Lane Grp Cap(c), veh/h	0	215	224	283	297	0				1838	965	0
V/C Ratio(X)	0.00	0.67	0.68	0.74	0.73	0.00				0.21	0.00	0.00
Avail Cap(c_a), veh/h	0	451	468	454	477	0				1838	965	0
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.94	0.94	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	29.4	29.4	31.7	31.7	0.0				9.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	3.7	3.6	3.5	3.3	0.0				0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.9	3.0	4.3	4.4	0.0				2.1	0.0	0.0
LnGrp Delay(d),s/veh	0.0	33.0	33.0	35.2	34.9	0.0				9.2	0.0	0.0
LnGrp LOS		C	C	D	C					A		
Approach Vol, veh/h		297			427						391	
Approach Delay, s/veh		33.0			35.1						9.2	
Approach LOS		C			D						A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				13.1		41.1		15.8
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				18.0		20.4		18.1
Max Q Clear Time (g_c+I1), s				7.6		6.2		10.2
Green Ext Time (p_c), s				1.0		1.2		1.1

Intersection Summary	
HCM 2010 Ctrl Delay	25.5
HCM 2010 LOS	C

Notes

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	40	10	10	230	150	40
Future Vol, veh/h	40	10	10	230	150	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	11	11	250	163	43

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	457	185	206	0	-	0
Stage 1	185	-	-	-	-	-
Stage 2	272	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	562	857	1365	-	-	-
Stage 1	847	-	-	-	-	-
Stage 2	774	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	557	857	1365	-	-	-
Mov Cap-2 Maneuver	557	-	-	-	-	-
Stage 1	839	-	-	-	-	-
Stage 2	774	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.6	0.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1365	-	599	-	-
HCM Lane V/C Ratio	0.008	-	0.091	-	-
HCM Control Delay (s)	7.7	0	11.6	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Intersection						
Int Delay, s/veh	1.4					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	230	150	40	40	10
Future Vol, veh/h	10	230	150	40	40	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	250	163	43	43	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	206	0	-	0	457	185
Stage 1	-	-	-	-	185	-
Stage 2	-	-	-	-	272	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1365	-	-	-	562	857
Stage 1	-	-	-	-	847	-
Stage 2	-	-	-	-	774	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1365	-	-	-	557	857
Mov Cap-2 Maneuver	-	-	-	-	557	-
Stage 1	-	-	-	-	839	-
Stage 2	-	-	-	-	774	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	11.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1365	-	-	-	599
HCM Lane V/C Ratio	0.008	-	-	-	0.091
HCM Control Delay (s)	7.7	0	-	-	11.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	970	0	0	350	430	10	0	280	0	0	0
Future Volume (veh/h)	30	970	0	0	350	430	10	0	280	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1900	1845	0	0	1845	1845	1900	1845	1845			
Adj Flow Rate, veh/h	31	1010	0	0	365	0	10	0	255			
Adj No. of Lanes	0	2	0	0	2	1	0	1	2			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	102	1259	0	0	1316	589	746	0	1172			
Arrive On Green	0.12	0.12	0.00	0.00	0.38	0.00	0.42	0.00	0.42			
Sat Flow, veh/h	47	3437	0	0	3597	1568	1757	0	2760			
Grp Volume(v), veh/h	555	486	0	0	365	0	10	0	255			
Grp Sat Flow(s),veh/h/ln	1805	1595	0	0	1752	1568	1757	0	1380			
Q Serve(g_s), s	4.6	13.4	0.0	0.0	3.3	0.0	0.1	0.0	2.6			
Cycle Q Clear(g_c), s	13.4	13.4	0.0	0.0	3.3	0.0	0.1	0.0	2.6			
Prop In Lane	0.06		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	762	599	0	0	1316	589	746	0	1172			
V/C Ratio(X)	0.73	0.81	0.00	0.00	0.28	0.00	0.01	0.00	0.22			
Avail Cap(c_a), veh/h	805	638	0	0	1402	627	746	0	1172			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.85	0.85	0.00	0.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	18.1	18.2	0.0	0.0	9.8	0.0	7.5	0.0	8.2			
Incr Delay (d2), s/veh	2.7	6.5	0.0	0.0	0.1	0.0	0.0	0.0	0.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	7.3	7.0	0.0	0.0	1.6	0.0	0.1	0.0	1.1			
LnGrp Delay(d),s/veh	20.8	24.6	0.0	0.0	9.9	0.0	7.5	0.0	8.6			
LnGrp LOS	C	C			A		A		A			
Approach Vol, veh/h		1041			365			265				
Approach Delay, s/veh		22.6			9.9			8.6				
Approach LOS		C			A			A				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4				8
Phs Duration (G+Y+Rc), s		23.6		21.4				21.4
Change Period (Y+Rc), s		4.5		4.5				4.5
Max Green Setting (Gmax), s		18.0		18.0				18.0
Max Q Clear Time (g_c+I1), s		4.6		15.4				5.3
Green Ext Time (p_c), s		0.8		1.5				1.7

Intersection Summary			
HCM 2010 Ctrl Delay			17.6
HCM 2010 LOS			B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	210	10	190	170	0	0	0	0	790	0	80
Future Volume (veh/h)	0	210	10	190	170	0	0	0	0	790	0	80
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1845	1900	1845	1845	0				1845	1845	1900
Adj Flow Rate, veh/h	0	219	6	188	192	0				870	0	0
Adj No. of Lanes	0	2	0	1	1	0				2	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	318	9	242	254	0				2182	1146	0
Arrive On Green	0.00	0.09	0.09	0.05	0.05	0.00				0.62	0.00	0.00
Sat Flow, veh/h	0	3577	95	1757	1845	0				3514	1845	0
Grp Volume(v), veh/h	0	110	115	188	192	0				870	0	0
Grp Sat Flow(s),veh/h/ln	0	1752	1828	1757	1845	0				1757	1845	0
Q Serve(g_s), s	0.0	5.5	5.5	9.5	9.3	0.0				11.2	0.0	0.0
Cycle Q Clear(g_c), s	0.0	5.5	5.5	9.5	9.3	0.0				11.2	0.0	0.0
Prop In Lane	0.00		0.05	1.00		0.00				1.00		0.00
Lane Grp Cap(c), veh/h	0	160	167	242	254	0				2182	1146	0
V/C Ratio(X)	0.00	0.69	0.69	0.78	0.76	0.00				0.40	0.00	0.00
Avail Cap(c_a), veh/h	0	350	366	361	379	0				2182	1146	0
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.97	0.97	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	39.7	39.7	41.6	41.5	0.0				8.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	5.2	5.0	5.9	4.6	0.0				0.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.9	3.0	5.0	5.1	0.0				5.5	0.0	0.0
LnGrp Delay(d),s/veh	0.0	44.8	44.7	47.5	46.1	0.0				9.1	0.0	0.0
LnGrp LOS		D	D	D	D					A		
Approach Vol, veh/h		225			380						870	
Approach Delay, s/veh		44.8			46.8						9.1	
Approach LOS		D			D						A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				12.7		60.4		16.9
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				18.0		40.0		18.5
Max Q Clear Time (g_c+I1), s				7.5		13.2		11.5
Green Ext Time (p_c), s				0.7		3.4		0.9

Intersection Summary	
HCM 2010 Ctrl Delay	24.3
HCM 2010 LOS	C

Notes

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	40	10	10	140	220	30
Future Vol, veh/h	40	10	10	140	220	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	11	11	152	239	33

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	430	256	272	0	-	0
Stage 1	256	-	-	-	-	-
Stage 2	174	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	582	783	1291	-	-	-
Stage 1	787	-	-	-	-	-
Stage 2	856	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	577	783	1291	-	-	-
Mov Cap-2 Maneuver	577	-	-	-	-	-
Stage 1	780	-	-	-	-	-
Stage 2	856	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.5	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1291	-	609	-	-
HCM Lane V/C Ratio	0.008	-	0.089	-	-
HCM Control Delay (s)	7.8	0	11.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Intersection						
Int Delay, s/veh	1.4					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	140	220	30	40	10
Future Vol, veh/h	10	140	220	30	40	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	152	239	33	43	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	272	0	-	0	430	256
Stage 1	-	-	-	-	256	-
Stage 2	-	-	-	-	174	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1291	-	-	-	582	783
Stage 1	-	-	-	-	787	-
Stage 2	-	-	-	-	856	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1291	-	-	-	577	783
Mov Cap-2 Maneuver	-	-	-	-	577	-
Stage 1	-	-	-	-	780	-
Stage 2	-	-	-	-	856	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	11.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1291	-	-	-	609
HCM Lane V/C Ratio	0.008	-	-	-	0.089
HCM Control Delay (s)	7.8	0	-	-	11.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Appendix E: Signal Warrant Worksheets

FEHR & PEERS

		Project	Del Puerto Canyon Dam TIA
Major Street	Del Puerto Canyon Road	Scenario	2019 Conditions
Minor Street	I-5 NB Ramps	Peak Hour	AM

Turn Movement Volumes

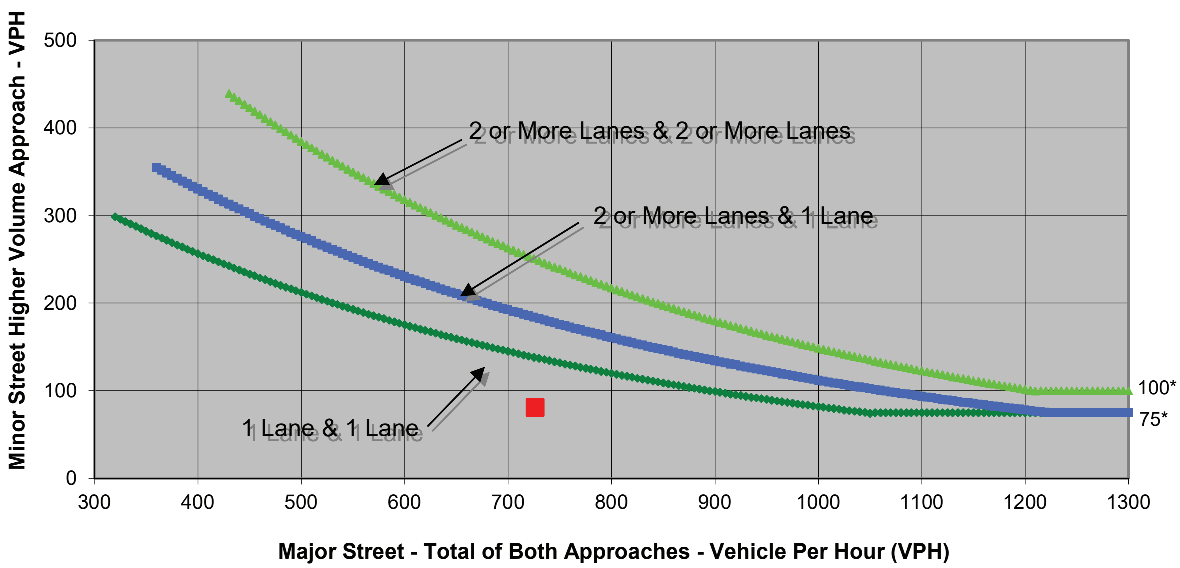
	NB	SB	EB	WB
Left	1	0	38	0
Through	0	0	223	98
Right	80	0	0	367
Total	81	0	261	465

Major Street Direction

	North/South
x	East/West

Figure 4C-4. Warrant 3B, Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR

ABOVE 40 MPH ON MAJOR STREET



* Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street Del Puerto Canyon Road	Minor Street I-5 NB Ramps	Warrant Met
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**726**	**81**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Major Street	Del Puerto Canyon Road		Project	Del Puerto Canyon Dam TIA
Minor Street	I-5 SB Ramps		Scenario	2019 Conditions
			Peak Hour	AM

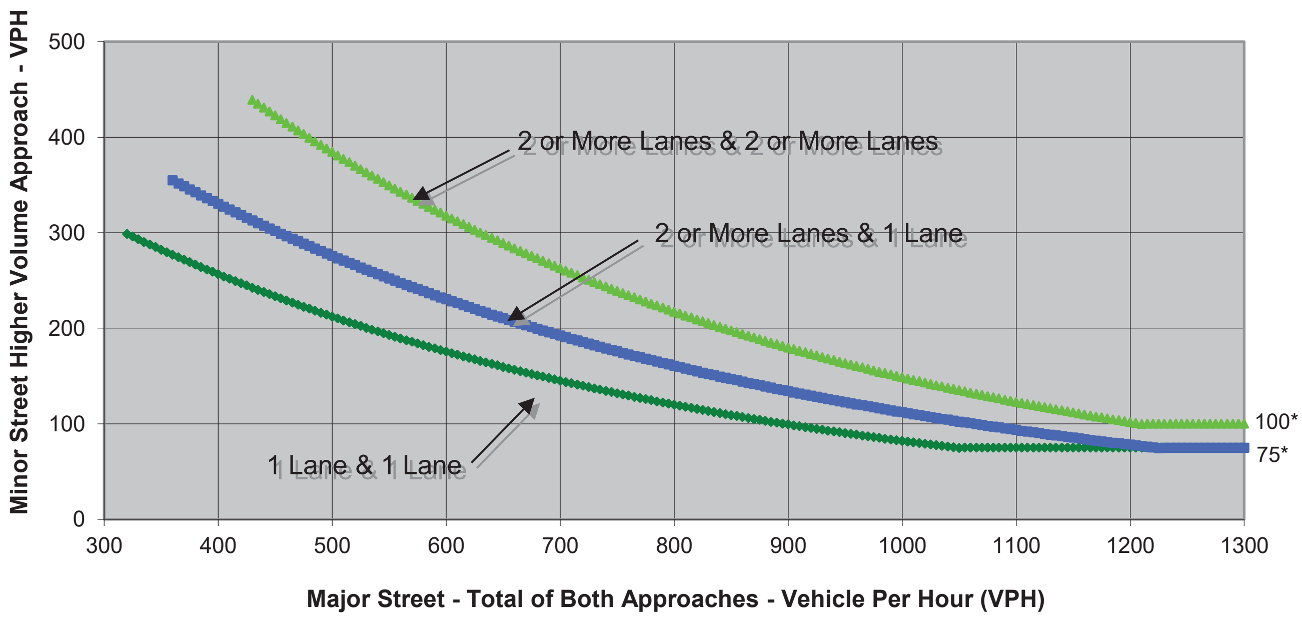
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	156	0	80
Through	0	1	105	19
Right	0	6	3	0
Total	0	163	108	99

Major Street Direction

	North/South
x	East/West

Figure 4C-4. Warrant 3B, Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR
ABOVE 40 MPH ON MAJOR STREET



* Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Del Puerto Canyon Road	I-5 SB Ramps	
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**207**	**163**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

			Project	Del Puerto Canyon Dam TIA
Major Street	Diablo Grande Parkway		Scenario	2019 Conditions
Minor Street	Del Puerto Canyon Road		Peak Hour	AM

Turn Movement Volumes

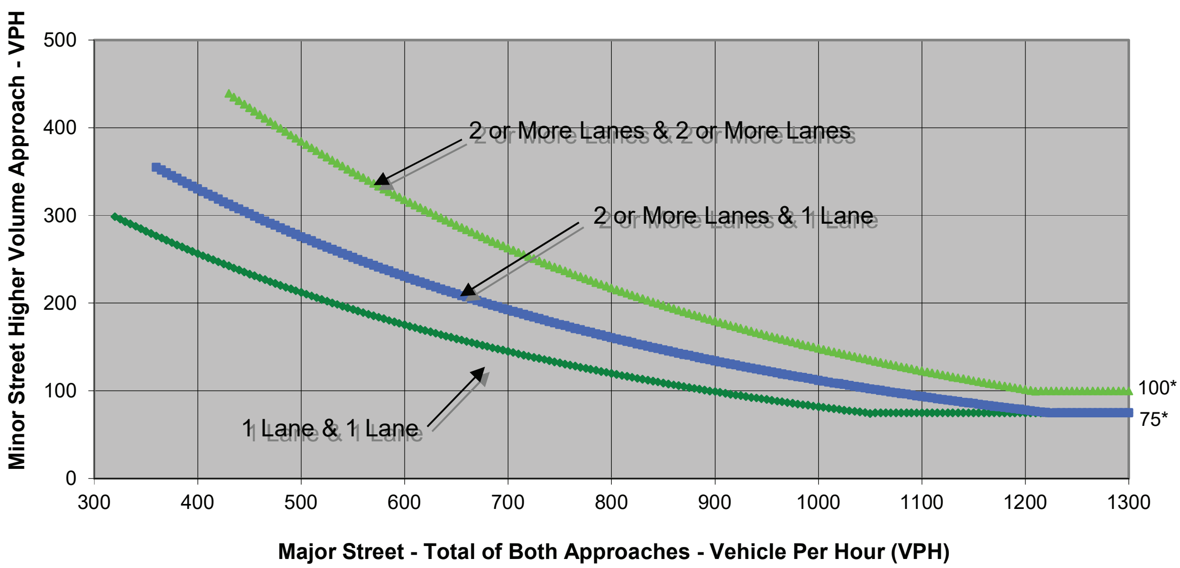
	NB	SB	EB	WB
Left	0	8	0	0
Through	0	0	100	20
Right	0	0	0	5
Total	0	8	100	25

Major Street Direction

	North/South
x	East/West

Figure 4C-4. Warrant 3B, Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR

ABOVE 40 MPH ON MAJOR STREET



* Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street Diablo Grande Parkway	Minor Street Del Puerto Canyon Road	Warrant Met
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**125**	**8**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

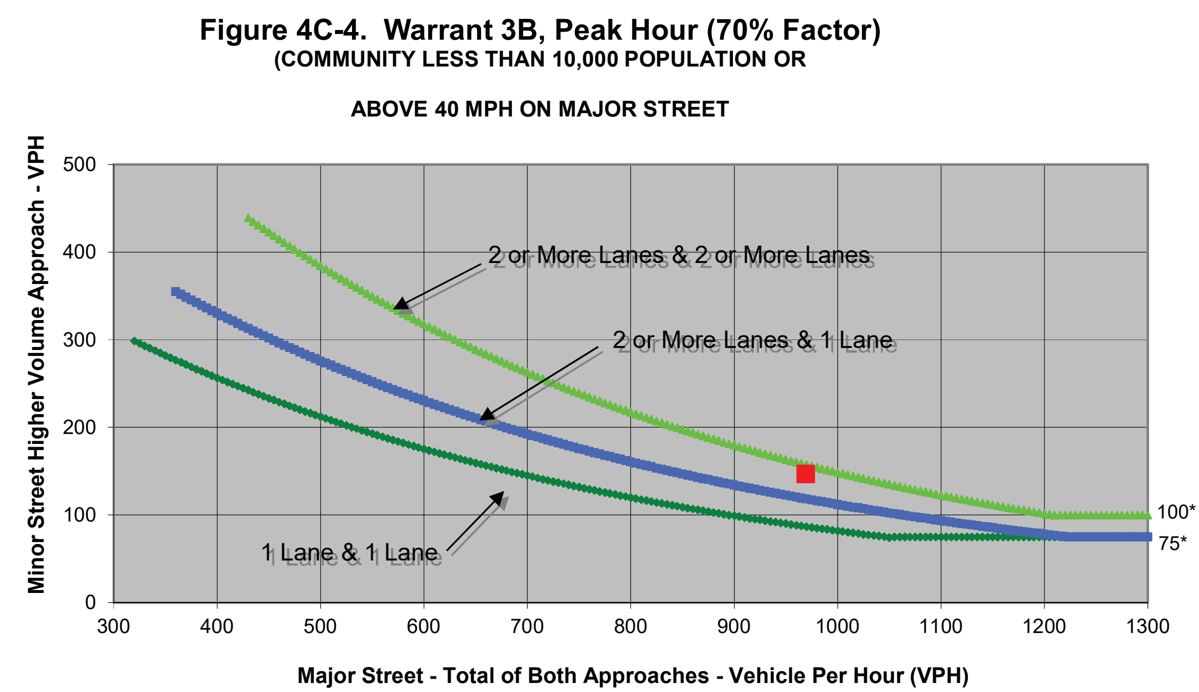
Major Street	Del Puerto Canyon Road		Project	Del Puerto Canyon Dam TIA
Minor Street	I-5 NB Ramps		Scenario	2019 Conditions
			Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	4	0	7	0
Through	0	0	546	158
Right	143	0	0	258
Total	147	0	553	416

Major Street Direction

	North/South
x	East/West



* Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street Del Puerto Canyon Road	Minor Street I-5 NB Ramps	Warrant Met
Number of Approach Lanes	**1**	**1**	**YES**
Traffic Volume (VPH) *	**969**	**147**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street | Del Puerto Canyon Road
Minor Street | I-5 SB Ramps

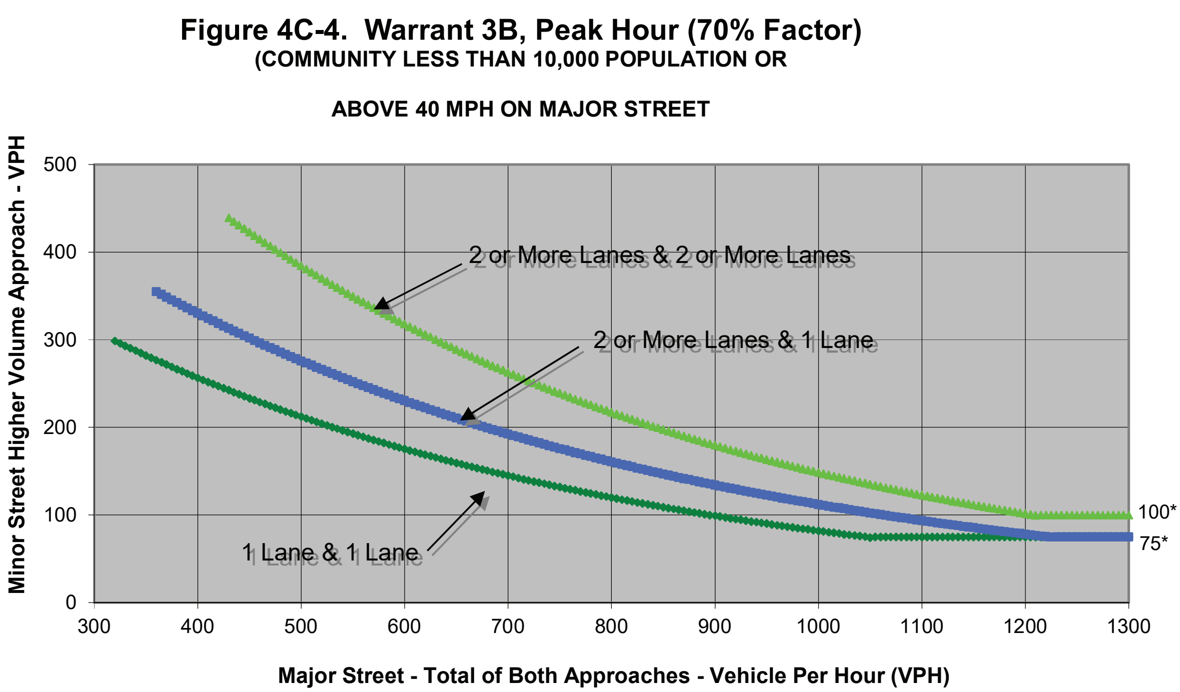
Project | Del Puerto Canyon Dam TIA
Scenario | 2019 Conditions
Peak Hour | PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	513	0	106
Through	0	1	40	56
Right	0	37	0	0
Total	0	551	40	162

Major Street Direction

	North/South
x	East/West



* Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street Del Puerto Canyon Road	Minor Street I-5 SB Ramps	Warrant Met
Number of Approach Lanes	**1**	**1**	**YES**
Traffic Volume (VPH) *	**202**	**551**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street	Diablo Grande Parkway	Project	Del Puerto Canyon Dam TIA
Minor Street	Del Puerto Canyon Road	Scenario	2019 Conditions
		Peak Hour	PM

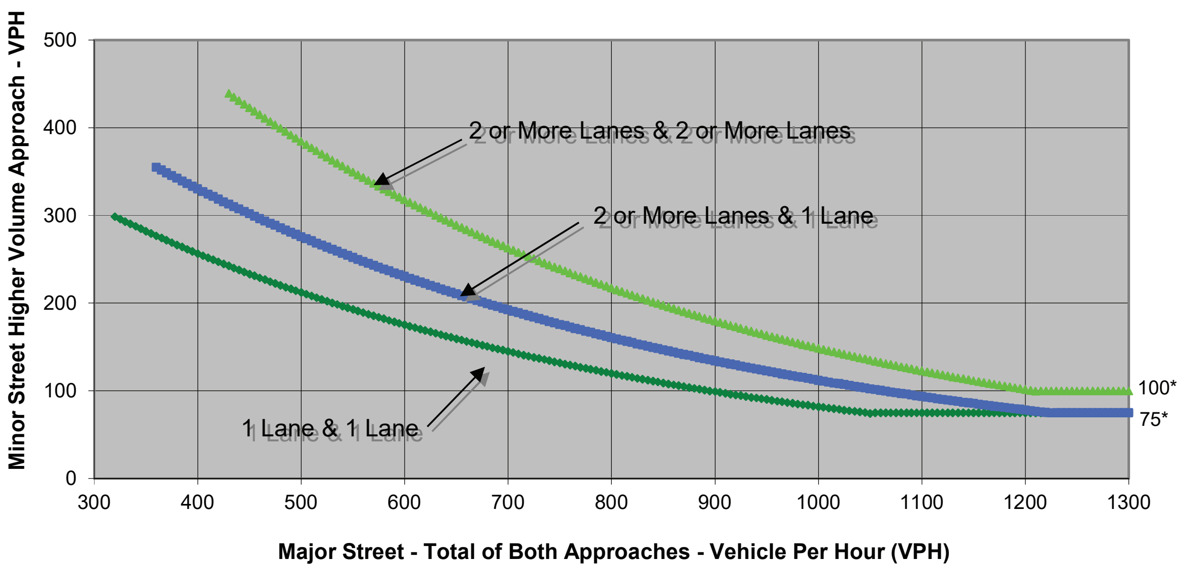
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	8	0	0
Through	0	0	32	84
Right	0	0	0	9
Total	0	8	32	93

Major Street Direction

	North/South
x	East/West

Figure 4C-4. Warrant 3B, Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR
ABOVE 40 MPH ON MAJOR STREET



* Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street Diablo Grande Parkway	Minor Street Del Puerto Canyon Road	Warrant Met
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**125**	**8**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

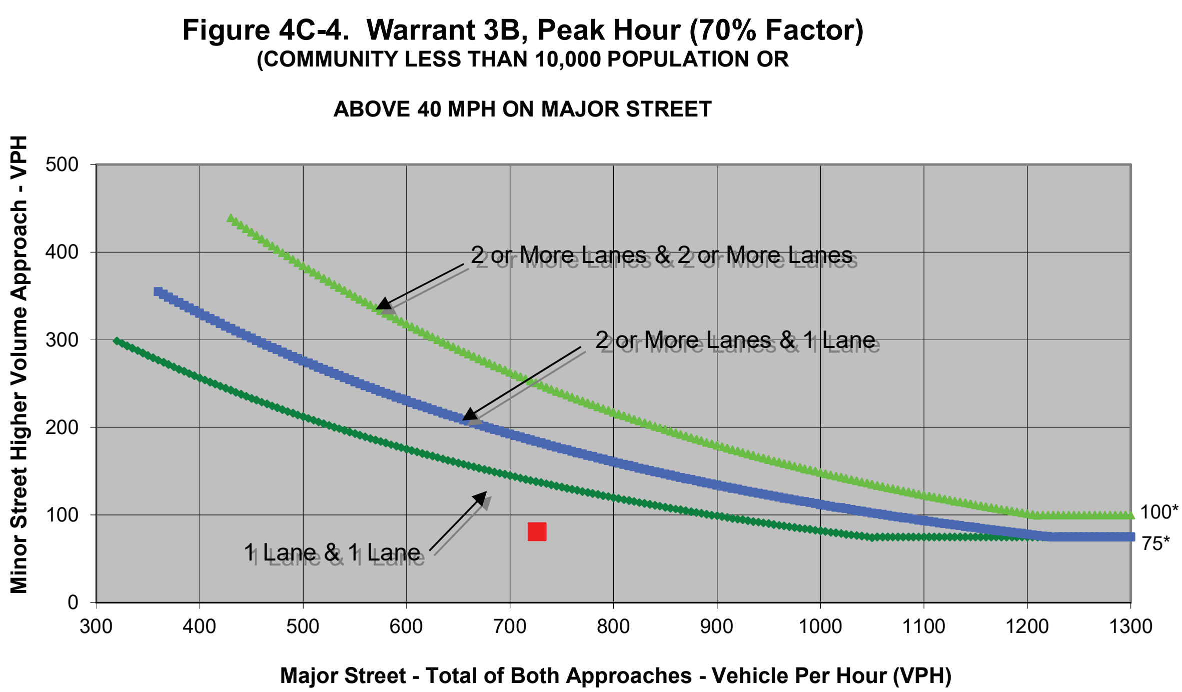
		Project	Del Puerto Canyon Dam TIA
Major Street	Del Puerto Canyon Road	Scenario	2019 Plus Project conditions
Minor Street	I-5 NB Ramps	Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	1	0	38	0
Through	0	0	223	98
Right	80	0	0	367
Total	81	0	261	465

Major Street Direction

	North/South
x	East/West



* Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street Del Puerto Canyon Road	Minor Street I-5 NB Ramps	Warrant Met
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**726**	**81**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

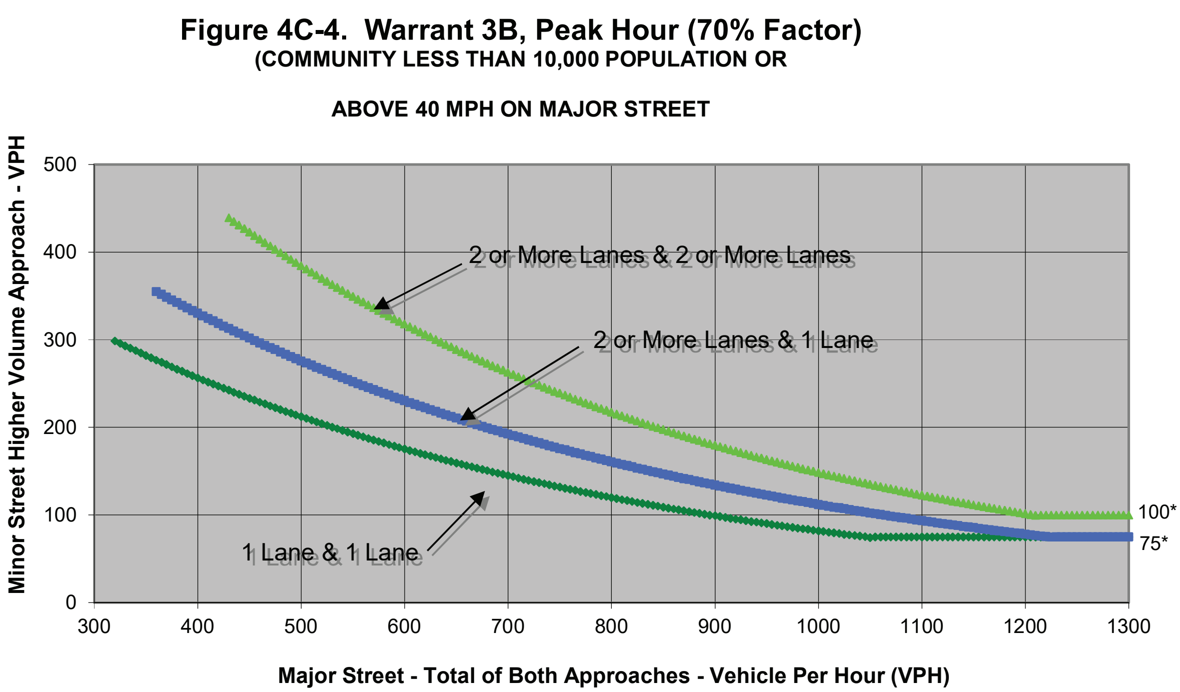
Major Street	Del Puerto Canyon Road	Project	Del Puerto Canyon Dam TIA
Minor Street	I-5 SB Ramps	Scenario	2019 Plus Project conditions
		Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	156	0	80
Through	0	1	105	19
Right	0	6	3	0
Total	0	163	108	99

Major Street Direction

	North/South
x	East/West



* Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street Del Puerto Canyon Road	Minor Street I-5 SB Ramps	Warrant Met
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**207**	**163**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street	Diablo Grande Parkway
Minor Street	Del Puerto Canyon Road

Project	Del Puerto Canyon Dam TIA
Scenario	2019 Plus Project conditions
Peak Hour	AM

Turn Movement Volumes

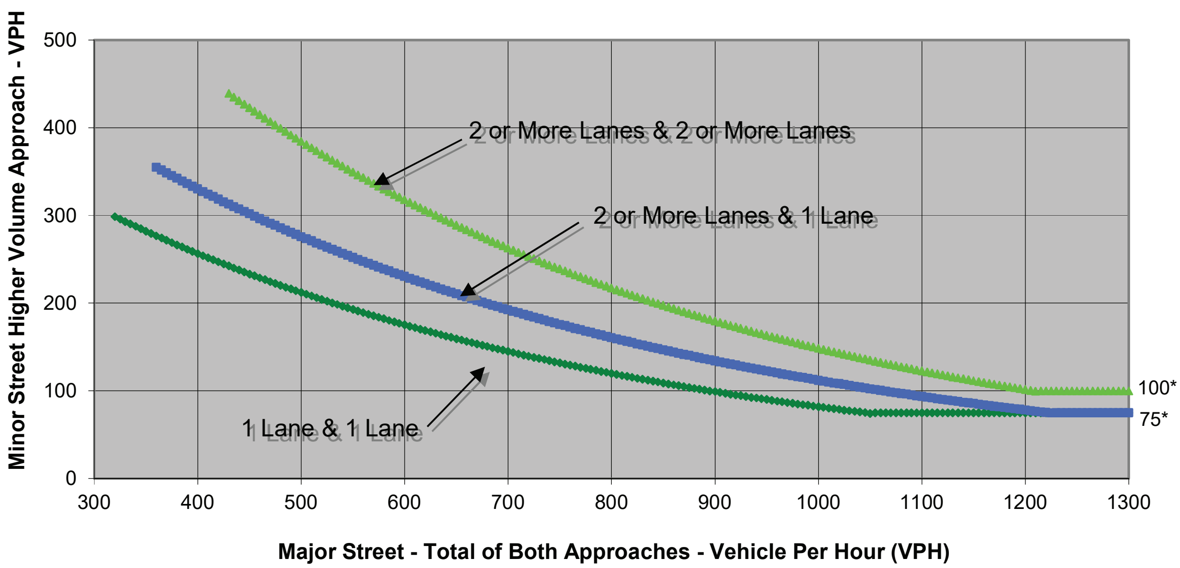
	NB	SB	EB	WB
Left	0	0	8	0
Through	100	20	0	0
Right	0	5	0	0
Total	100	25	8	0

Major Street Direction

	North/South
x	East/West

Figure 4C-4. Warrant 3B, Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR

ABOVE 40 MPH ON MAJOR STREET



* Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Diablo Grande Parkway	Del Puerto Canyon Road	
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**8**	**100**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

		Project	Del Puerto Canyon Dam TIA
Major Street	Del Puerto Canyon Road	Scenario	2019 Plus Project conditions
Minor Street	I-5 NB Ramps	Peak Hour	PM

Turn Movement Volumes

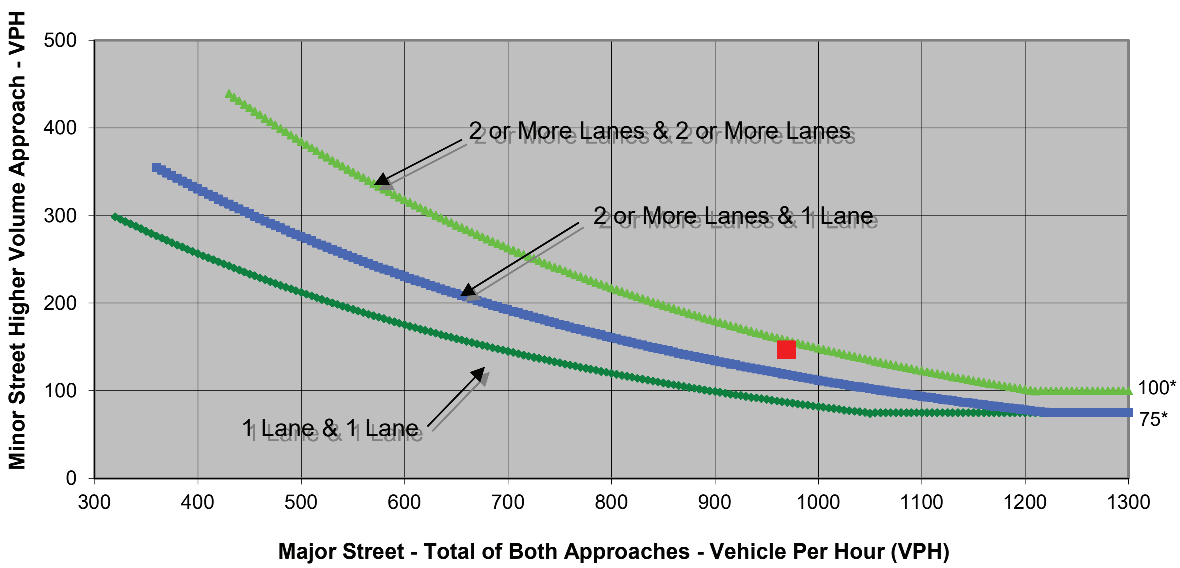
	NB	SB	EB	WB
Left	4	0	7	0
Through	0	0	546	158
Right	143	0	0	258
Total	147	0	553	416

Major Street Direction

	North/South
x	East/West

Figure 4C-4. Warrant 3B, Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR

ABOVE 40 MPH ON MAJOR STREET



* Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street Del Puerto Canyon Road	Minor Street I-5 NB Ramps	Warrant Met
Number of Approach Lanes	**1**	**1**	**YES**
Traffic Volume (VPH) *	**969**	**147**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR & PEERS

Major Street	Del Puerto Canyon Road	Project	Del Puerto Canyon Dam TIA
Minor Street	I-5 SB Ramps	Scenario	2019 Plus Project conditions
		Peak Hour	PM

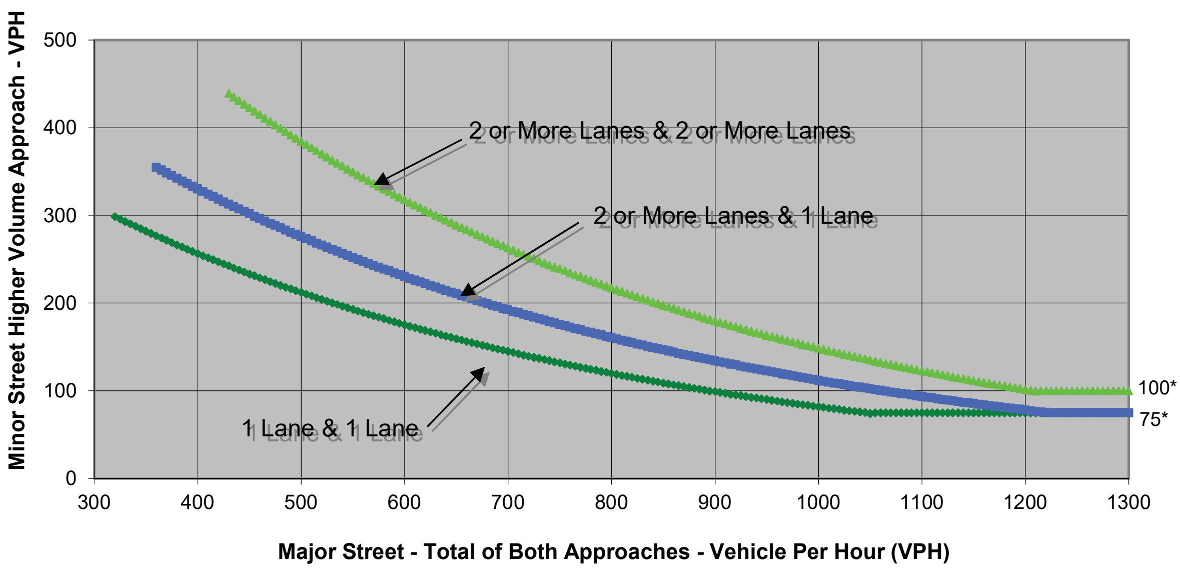
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	513	0	106
Through	0	1	40	56
Right	0	37	0	0
Total	0	551	40	162

Major Street Direction

	North/South
x	East/West

Figure 4C-4. Warrant 3B, Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR
ABOVE 40 MPH ON MAJOR STREET



* Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street Del Puerto Canyon Road	Minor Street I-5 SB Ramps	Warrant Met
Number of Approach Lanes	**1**	**1**	**YES**
Traffic Volume (VPH) *	**202**	**551**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street	Diablo Grande Parkway
Minor Street	Del Puerto Canyon Road

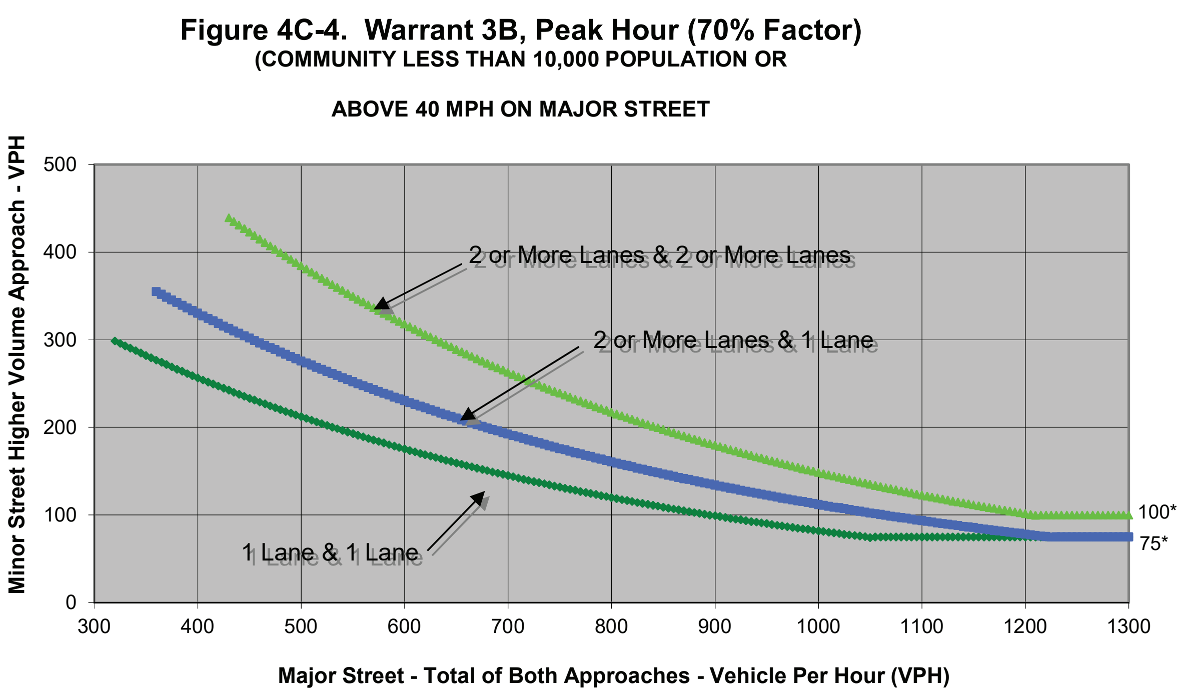
Project	Del Puerto Canyon Dam TIA
Scenario	2019 Plus Project conditions
Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	0	8	0
Through	32	84	0	0
Right	0	9	0	0
Total	32	93	8	0

Major Street Direction

	North/South
x	East/West



* Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street Diablo Grande Parkway	Minor Street Del Puerto Canyon Road	Warrant Met
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**8**	**93**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR & PEERS

			Project	Del Puerto Canyon Dam TIA
Major Street	Del Puerto Canyon Road		Scenario	2040 Conditions
Minor Street	I-5 NB Ramps		Peak Hour	AM

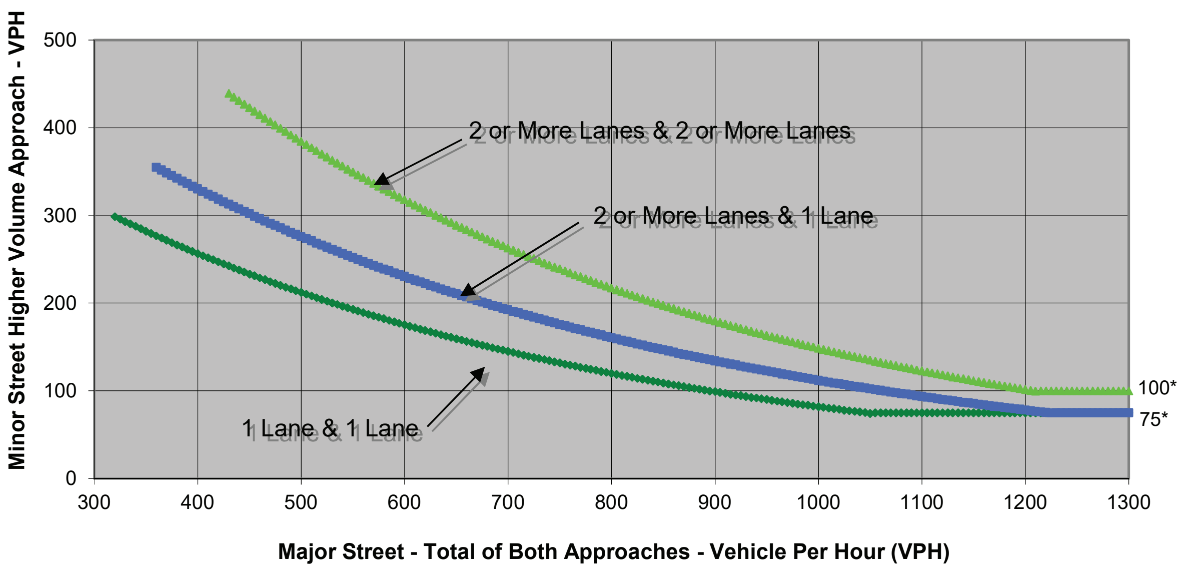
Turn Movement Volumes

	NB	SB	EB	WB
Left	10	0	70	0
Through	0	0	520	370
Right	160	0	0	630
Total	170	0	590	1,000

Major Street Direction

	North/South
x	East/West

Figure 4C-4. Warrant 3B, Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR
ABOVE 40 MPH ON MAJOR STREET



* Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street Del Puerto Canyon Road	Minor Street I-5 NB Ramps	Warrant Met
Number of Approach Lanes	**1**	**1**	**YES**
Traffic Volume (VPH) *	**1,590**	**170**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Major Street	Del Puerto Canyon Road		Project	Del Puerto Canyon Dam TIA
Minor Street	I-5 SB Ramps		Scenario	2040 Conditions
			Peak Hour	AM

Turn Movement Volumes

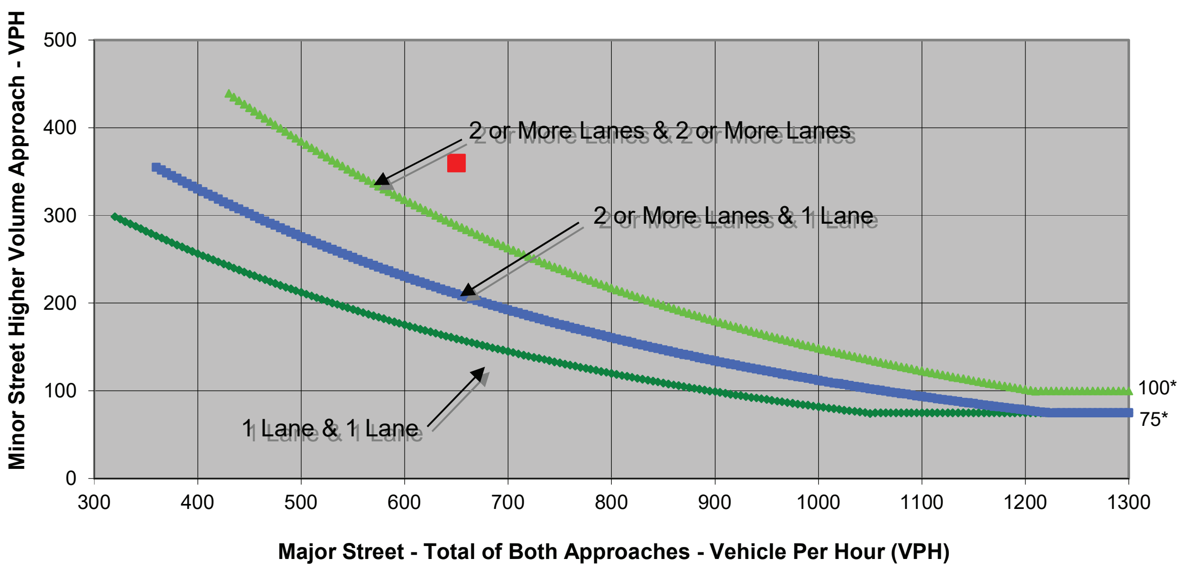
	NB	SB	EB	WB
Left	0	330	0	210
Through	0	10	260	170
Right	0	20	10	0
Total	0	360	270	380

Major Street Direction

	North/South
x	East/West

Figure 4C-4. Warrant 3B, Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR

ABOVE 40 MPH ON MAJOR STREET



* Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street Del Puerto Canyon Road	Minor Street I-5 SB Ramps	Warrant Met
Number of Approach Lanes	**1**	**1**	**YES**
Traffic Volume (VPH) *	**650**	**360**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

			Project	Del Puerto Canyon Dam TIA
Major Street	Diablo Grande Parkway		Scenario	2040 Conditions
Minor Street	Del Puerto Canyon Road		Peak Hour	AM

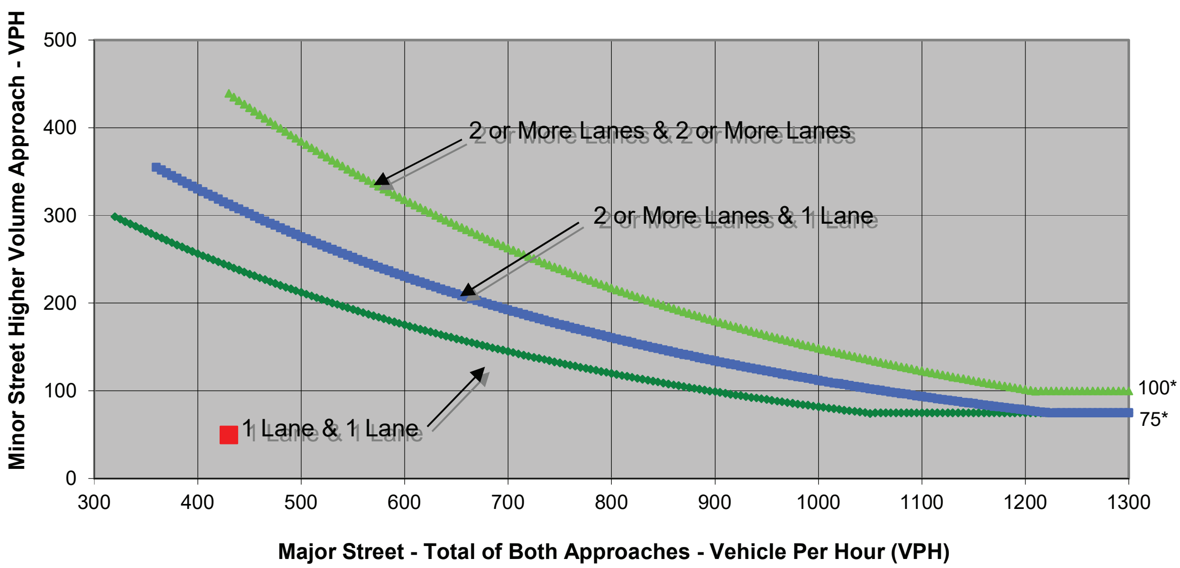
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	40	10	0
Through	0	0	230	150
Right	0	10	0	40
Total	0	50	240	190

Major Street Direction

	North/South
x	East/West

Figure 4C-4. Warrant 3B, Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR
ABOVE 40 MPH ON MAJOR STREET



* Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street Diablo Grande Parkway	Minor Street Del Puerto Canyon Road	Warrant Met
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**430**	**50**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

			Project	Del Puerto Canyon Dam TIA
Major Street	Del Puerto Canyon Road		Scenario	2040 Conditions
Minor Street	I-5 NB Ramps		Peak Hour	PM

Turn Movement Volumes

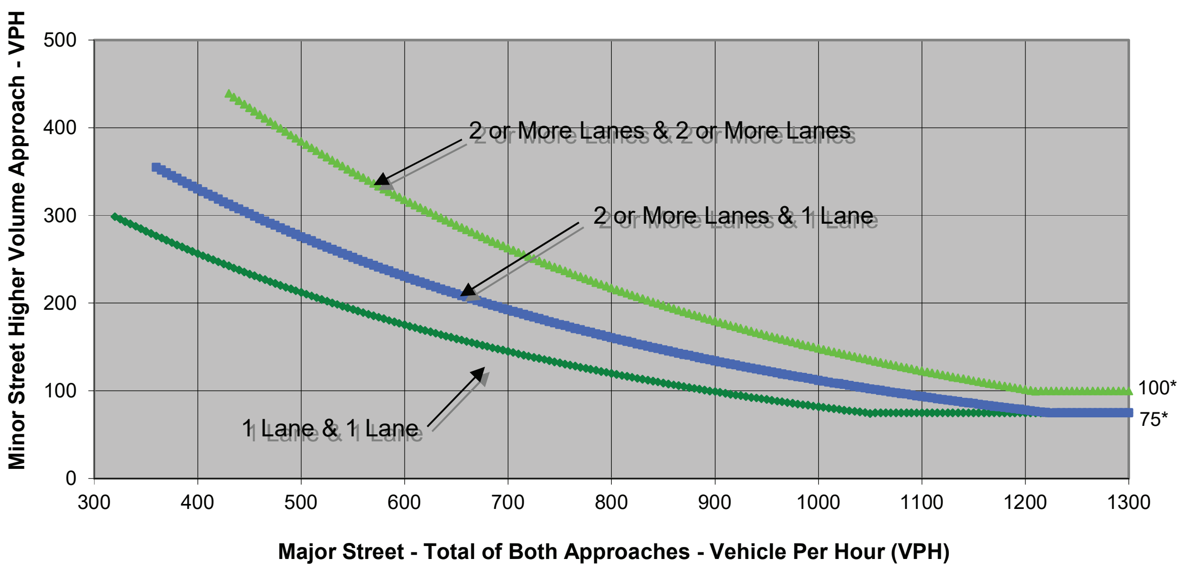
	NB	SB	EB	WB
Left	10	0	30	0
Through	0	0	970	350
Right	280	0	0	430
Total	290	0	1,000	780

Major Street Direction

	North/South
x	East/West

Figure 4C-4. Warrant 3B, Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR

ABOVE 40 MPH ON MAJOR STREET



* Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street Del Puerto Canyon Road	Minor Street I-5 NB Ramps	Warrant Met
Number of Approach Lanes	**1**	**1**	**<u>YES</u>**
Traffic Volume (VPH) *	**1,780**	**290**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

		Project	Del Puerto Canyon Dam TIA
Major Street	Del Puerto Canyon Road	Scenario	2040 Conditions
Minor Street	I-5 SB Ramps	Peak Hour	PM

Turn Movement Volumes

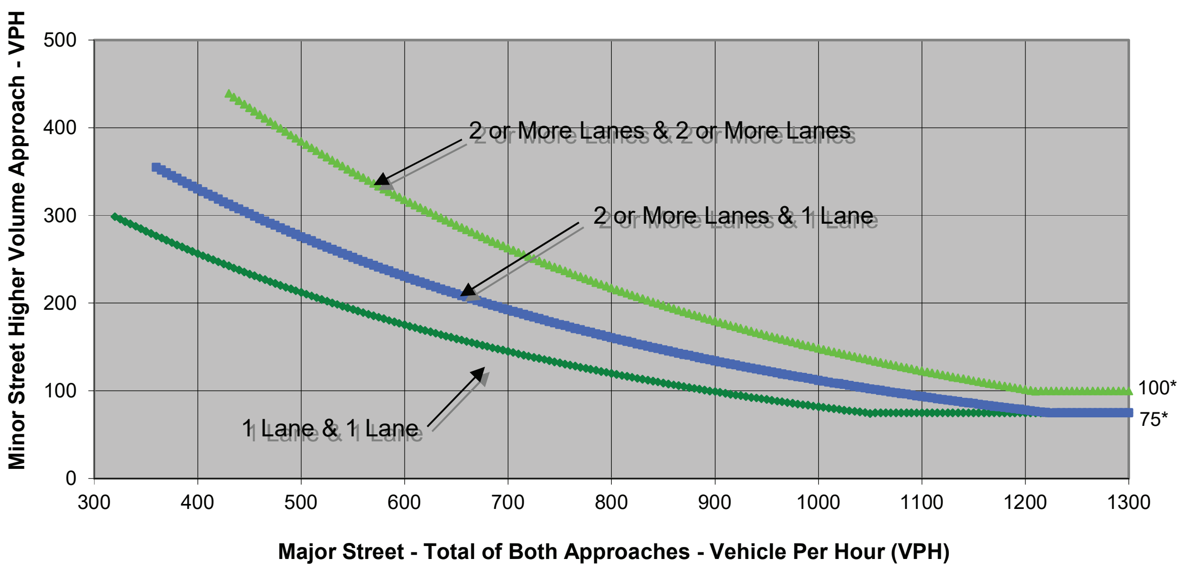
	NB	SB	EB	WB
Left	0	790	0	190
Through	0	0	210	170
Right	0	80	10	0
Total	0	870	220	360

Major Street Direction

	North/South
x	East/West

Figure 4C-4. Warrant 3B, Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR

ABOVE 40 MPH ON MAJOR STREET



* Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	**Minor Street**	**Warrant Met**
	Del Puerto Canyon Road	I-5 SB Ramps	
Number of Approach Lanes	**1**	**1**	**YES**
Traffic Volume (VPH) *	**580**	**870**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street	Diablo Grande Parkway
Minor Street	Del Puerto Canyon Road

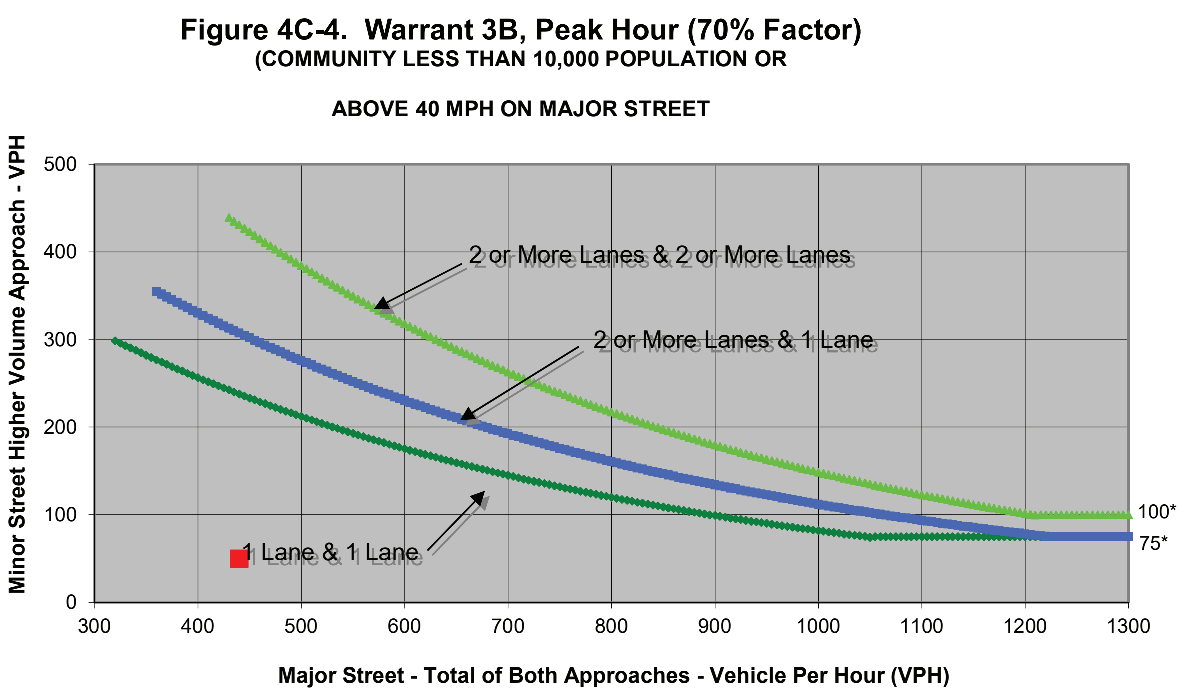
Project	Del Puerto Canyon Dam TIA
Scenario	2040 Conditions
Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	40	10	0
Through	0	0	180	220
Right	0	10	0	30
Total	0	50	190	250

Major Street Direction

	North/South
x	East/West



* Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street Diablo Grande Parkway	Minor Street Del Puerto Canyon Road	Warrant Met
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**440**	**50**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street	Del Puerto Canyon Road
Minor Street	I-5 NB Ramps

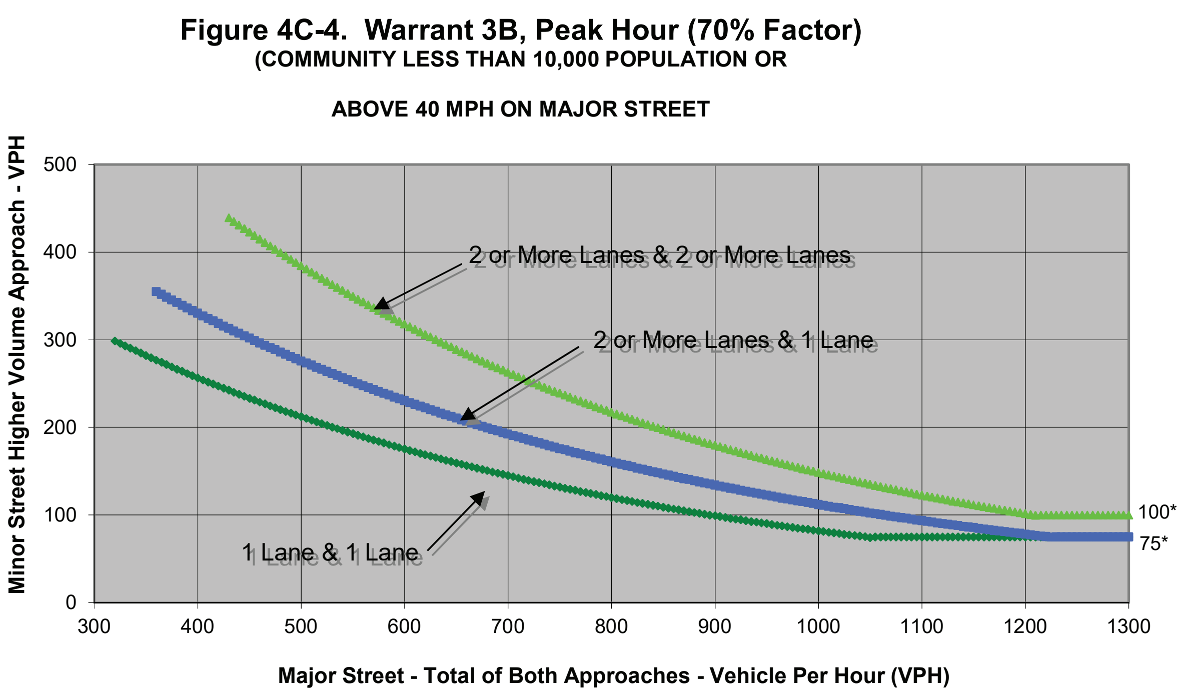
Project	Del Puerto Canyon Dam TIA
Scenario	2040 Plus Project conditions
Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	10	0	70	0
Through	0	0	520	370
Right	160	0	0	630
Total	170	0	590	1,000

Major Street Direction

	North/South
x	East/West



* Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street Del Puerto Canyon Road	Minor Street I-5 NB Ramps	Warrant Met
Number of Approach Lanes	**1**	**1**	**YES**
Traffic Volume (VPH) *	**1,590**	**170**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street	Del Puerto Canyon Road
Minor Street	I-5 SB Ramps

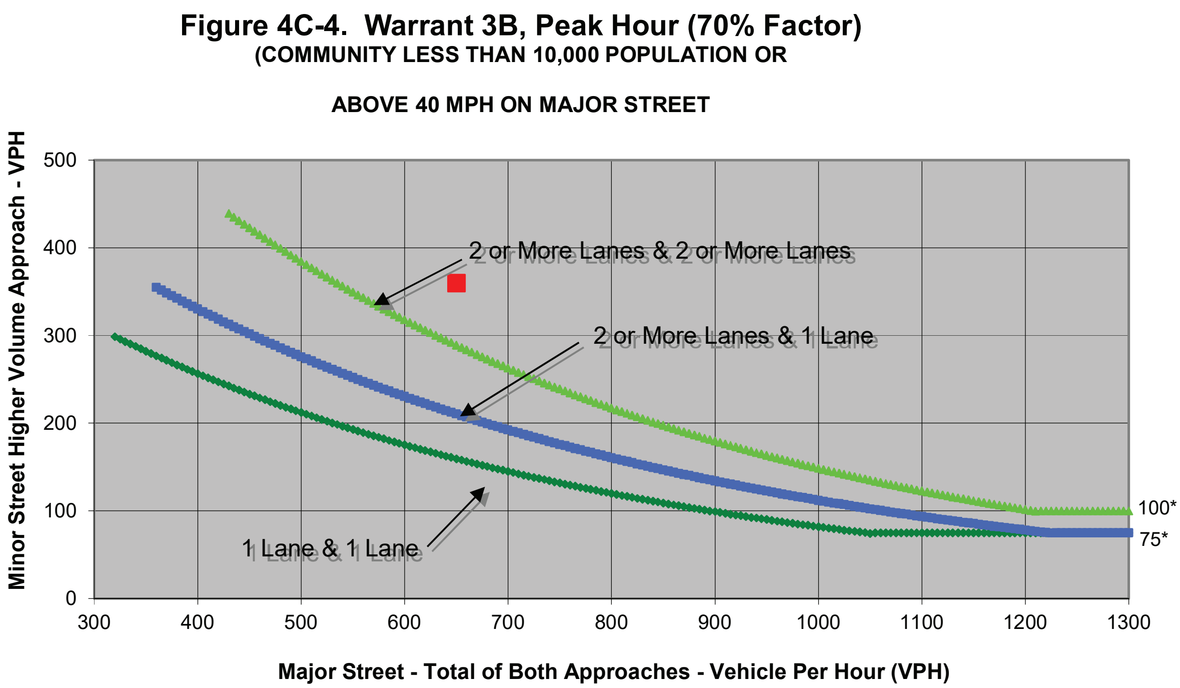
Project	Del Puerto Canyon Dam TIA
Scenario	2040 Plus Project conditions
Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	330	0	210
Through	0	10	260	170
Right	0	20	10	0
Total	0	360	270	380

Major Street Direction

	North/South
x	East/West



* Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street Del Puerto Canyon Road	Minor Street I-5 SB Ramps	Warrant Met
Number of Approach Lanes	**1**	**1**	**YES**
Traffic Volume (VPH) *	**650**	**360**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street	Diablo Grande Parkway
Minor Street	Del Puerto Canyon Road

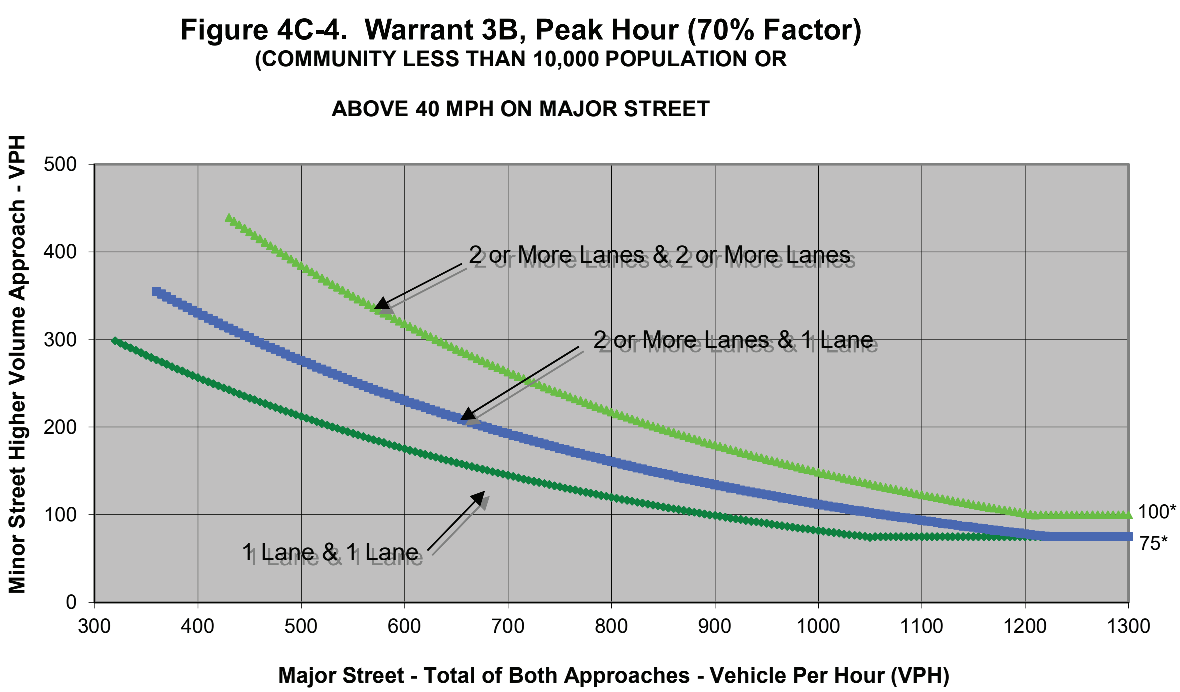
Project	Del Puerto Canyon Dam TIA
Scenario	2040 Plus Project conditions
Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	10	0	40	0
Through	230	150	0	0
Right	0	40	10	0
Total	240	190	50	0

Major Street Direction

	North/South
x	East/West



* Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street Diablo Grande Parkway	Minor Street Del Puerto Canyon Road	Warrant Met
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**50**	**240**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Major Street	Del Puerto Canyon Road		Project	Del Puerto Canyon Dam TIA
Minor Street	I-5 NB Ramps		Scenario	2040 Plus Project conditions
			Peak Hour	PM

Turn Movement Volumes

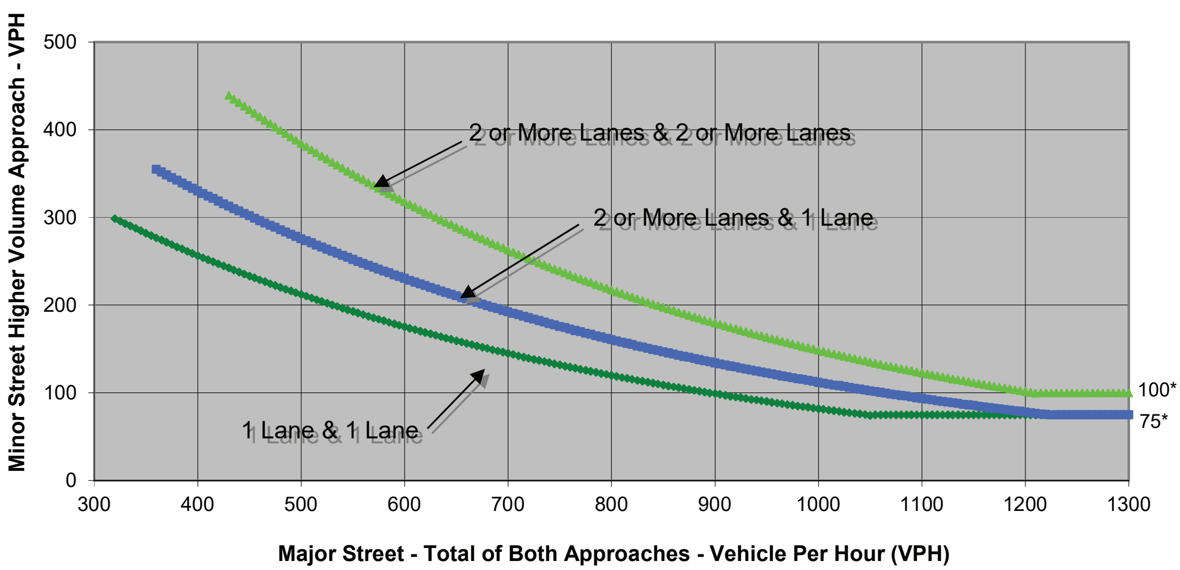
	NB	SB	EB	WB
Left	10	0	30	0
Through	0	0	970	350
Right	280	0	0	430
Total	290	0	1,000	780

Major Street Direction

	North/South
x	East/West

Figure 4C-4. Warrant 3B, Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR

ABOVE 40 MPH ON MAJOR STREET



* Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street Del Puerto Canyon Road	**Minor Street** I-5 NB Ramps	**Warrant Met**
Number of Approach Lanes	**1**	**1**	**YES**
Traffic Volume (VPH) *	**1,780**	**290**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR & PEERS

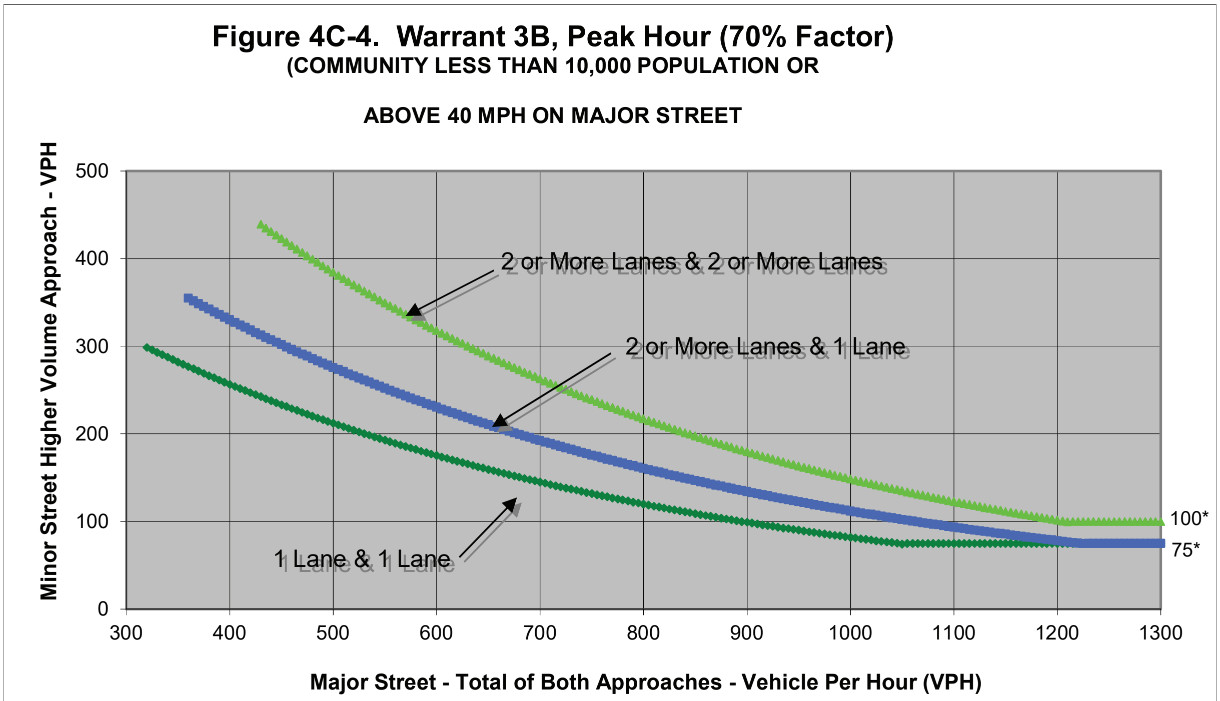
		Project	Del Puerto Canyon Dam TIA
Major Street	Del Puerto Canyon Road	Scenario	2040 Plus Project conditions
Minor Street	I-5 SB Ramps	Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	790	0	190
Through	0	10	210	170
Right	0	80	10	0
Total	0	880	220	360

Major Street Direction

	North/South
x	East/West



* Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street Del Puerto Canyon Road	Minor Street I-5 SB Ramps	Warrant Met
Number of Approach Lanes	**1**	**1**	**YES**
Traffic Volume (VPH) *	**580**	**880**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

			Project	Del Puerto Canyon Dam TIA
Major Street	Diablo Grande Parkway		Scenario	2040 Plus Project conditions
Minor Street	Del Puerto Canyon Road		Peak Hour	PM

Turn Movement Volumes

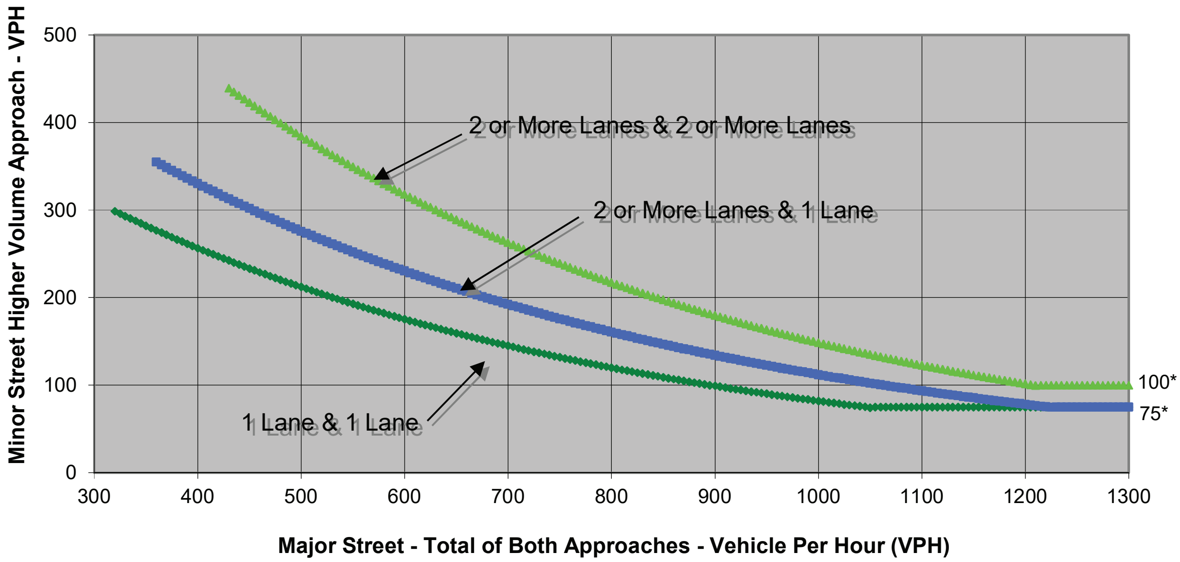
	NB	SB	EB	WB
Left	10	0	40	0
Through	140	220	0	0
Right	0	30	10	0
Total	150	250	50	0

Major Street Direction

	North/South
x	East/West

Figure 4C-4. Warrant 3B, Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR

ABOVE 40 MPH ON MAJOR STREET



* Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street Diablo Grande Parkway	Minor Street Del Puerto Canyon Road	Warrant Met
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**50**	**250**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

APPENDIX H: Dam Breach Inundation Analysis - Initial Assessment

nhc
northwest hydraulic consultants

NHC Ref. No. 50004561

19 March 2020

WOODARD & CURRAN
2175 North California Blvd., Suite 315
Walnut Creek, CA
94596

Attention: **Andy Neal**
Senior Vice President, Operations Lead

Copy to: **Mike Matson- Senior Civil Engineer (mmatson@woodardcurran.com)**
Robin Cort- Senior Environmental Planner (rcort@woodardcurran.com)
Via email: aneal@woodardcurran.com

Re: **Del Puerto Canyon Reservoir Dam Breach Inundation Study – Initial Assessment Documentation**

1 BACKGROUND

NHC was retained by Woodard & Curran to prepare dam breach inundation mapping for the proposed Del Puerto Canyon Reservoir Dam in Stanislaus County, CA. Initial modeling has been completed based on early-stage concept design information to support the EIS/EIR document assessment of potential impacts.

The next phase of work will be to update the analysis to reflect preliminary and final design, and provide a draft submittal to DSOD. The dam is currently at a conceptual level of design. Submission of dam inundation maps to California Division of Safety of Dams (DSOD), typically occurs near final design when the dam details are finalized. Dam inundation mapping is not a variable in the design. The function of the dam inundation maps submitted to DSOD are for emergency planning purposes. Final maps are reviewed and included as part of the Dam Emergency Action Plan (EAP).

The purpose of this memorandum is to document the work that has been done to date, and to summarize the steps that remain once design work is near completion.

2 DATA SOURCES

This section summarizes and memorializes the sources used for the modeling effort. Woodard & Curran provided early stage design drawings for the proposed dam (Gannett Fleming, 2019), information on several culverts beneath Interstate-5 and the California Aqueduct, and topographic information for the immediate dam vicinity.

2.1 Dam Structure

As currently envisaged, Del Puerto Dam will consist of a Main Dam at the mouth of Del Puerto Creek, just upstream of where the creek flows beneath Interstate-5, as well as several Saddle Dams. The Main Dam characteristics are summarized in Table 1 below. All elevations in this report are in reference to the North American Vertical Datum of 1988 (NAVD88).

Table 1: Main Dam Features Based on Concept Level Drawings (Gannett Fleming, 2019)

Del Puerto Project Features	Value
Dam Crest Elevation	480ft
Upstream/Downstream Side Slopes	3.5:1; 2.5:1
Top Width	30ft
Spillway Characteristics	Ogee with crest at elev. 450ft
Reservoir Normal Max Pool	450ft
Elev. At Upstream/Downstream toe	230ft/220ft

In addition to the Main Dam there are three Saddle Dams. Saddle Dams 2 and 3, as depicted in the concept level design drawings, are entirely above the normal pool elevation of the proposed reservoir. Saddle Dam 1 does impound water. It includes similar features to the Main Dam (crest elevation, top width, side slopes) but has upstream and downstream toe elevations of approximately 310ft and 340ft, respectively. Saddle Dam 1 meets the requirements of a critical appurtenant structure as defined in 23 CCR § 335.2 (a)(3), and thus requires its own dam breach inundation modeling and mapping.

2.2 Topography

The topography used in the modeling and mapping is a mosaic, comprised of data from three sources:

1. A high-resolution (1-foot) terrain model of the immediate dam vicinity. Data collected in 2019 by Landpoint and provided to NHC by Woodard & Curran.

2. A 3-foot resolution coverage of the central valley area downstream of the dam, obtained from the Central Valley Floodplain Evaluation and Delineation (CVFED) Program (DWR, 2009). This dataset covers a large majority of the study area.

3. 10-meter resolution data from the National Elevation Dataset was used to represent the reservoir region (USGS, 2019).

Data from these sources was merged into a single raster, with a hierarchy in overlap regions determined by the order listed above. The merged raster includes a 6-foot grid cell resolution, which was deemed sufficient for dam breach modeling and mapping purposes while allowing manageable file sizes.

2.3 Culverts

Del Puerto Creek passes through culverts beneath Interstate-5 and the California Aqueduct. In addition, there are several culverts under these structures at the mouths of various side canyons to the south of Del Puerto Creek. Information on these culverts was provided to NHC by Woodard & Curran in the form of as-built drawings (see Appendix A). The culverts represented in the model are shown in Figure 1.

2.4 Land Cover

Land cover information was obtained from the National Land Cover Database (USGS, 2016) for the model extent. Manning 'n' values (see Table 2) were assigned to each land cover within the study area through experience and professional judgment. The values selected are similar to those used on other projects where calibration data was available. The 'n' value for developed regions reflects energy losses from both the surface roughness as well as building blockages, since buildings were not explicitly included in the model.

Table 2: Land Cover and Manning n Values

Land Cover Type	Manning 'n' Value
Deciduous forest	0.12
Evergreen forest	0.12
Mixed forest	0.12
Grassland	0.035
Pasture/hay	0.03
Cultivated crops	0.06
Shrub/scrub	0.06
Wetlands	0.08
Open water	0.012
Developed, high intensity	0.1
Developed, medium intensity	0.08
Developed, low intensity	0.06
Developed, open space	0.04

2.5 Boundary Conditions

The hydraulic model contains three inflow boundaries and one outflow boundary. DSOD only requires dam breach inundation analysis for "sunny-day" conditions; therefore, the inflows used in this project represent annual average flows for each of the gages listed below in Table 3. The inflows remain steady throughout the dam breach simulations.

Table 3: Model Boundary Conditions

Boundary Type and Location	Data Source	Boundary Condition
Inflow- San Joaquin River	USGS 11274550, San Joaquin River Near Crows Landing	1,928 cfs. Average flow 1995-2018
Inflow- Tuolumne River	USGS 11290000, Tuolumne River at Modesto	1,191 cfs. Average flow 1988-2018
Inflow- Del Puerto Creek	USGS 11274630, Del Puerto Creek Near Patterson	7 cfs. Average flow 1988-2018
Outflow- San Joaquin River	CVFED Lidar	0.005. Slope in water surface apparent in LiDAR, adopted as normal depth boundary slope

3 MODEL DEVELOPMENT

HEC-RAS 5.0.7 was selected by NHC as the hydraulic modeling tool for simulating the dam breach and routing the resulting floodwave. HEC-RAS 5.0.7 offers both 1-D and 2-D hydraulic modeling capabilities. For this project, a two-dimensional model structure was selected due to the location of the proposed dam near the mouth of a canyon. Large flood waves emanating from a narrow canyon onto a flat expanse would be expected to fan out, making traditional one-dimensional models a poor choice.

The hydraulic model is comprised of approximately 112,000 two-dimensional grid cells. The model mesh resolution is 200-feet over the majority of the model domain but is refined to 100-feet near the dam and the immediate downstream area. The model is fixed bed, and represents the topography provided. The model does not simulate erosion or changes in topography outside of the dam breach.

Structures are represented within the model mesh with “2D connection” features, which allow the user to enter both weir elevation along designated lines, and culverts that pass through those weirs. The proposed Main Dam, Saddle Dam 1, and downstream culverts under Interstate-5 and the aqueducts were represented in this manner. Saddle Dams 2 and 3 are not represented in the model since their toe elevations are above the normal pool elevation. Breaklines were used to refine the mesh and ensure that key topographic information is represented correctly in the model.

Figure 1 below shows the model representation of the area around the proposed dam. The model mesh is shown by the thin black lines, illustrating the grid cells. The heavy grey lines are 2D connections where weir information is entered by the user (proposed dam characteristics for the Main Dam and Saddle Dam 1, existing topography for others). The white lines passing through heavy grey lines are culverts represented in the model.

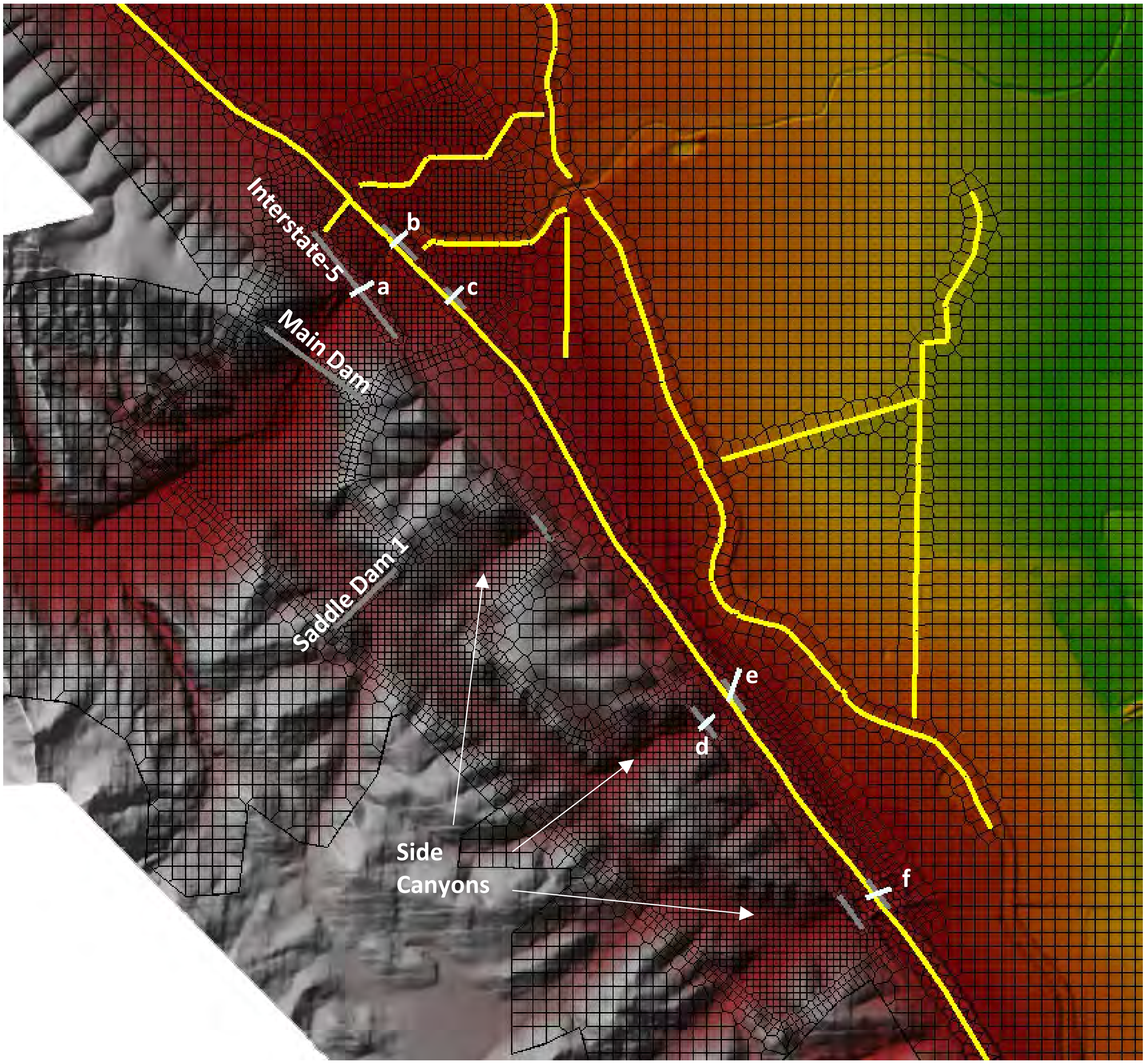


Figure 1: Model features near proposed dam site. Culvert letters correspond to plans in Appendix.

Figure 2 shows the full model extent, including the boundary condition locations (heavy blue lines). The model includes the San Joaquin River from Crows Landing Road downstream to State Route 132.The model encompasses the confluence of the San Joaquin and Tuolumne Rivers, and extends up the Tuolumne River to Modesto. The total area of the model domain is approximately 160 square miles.

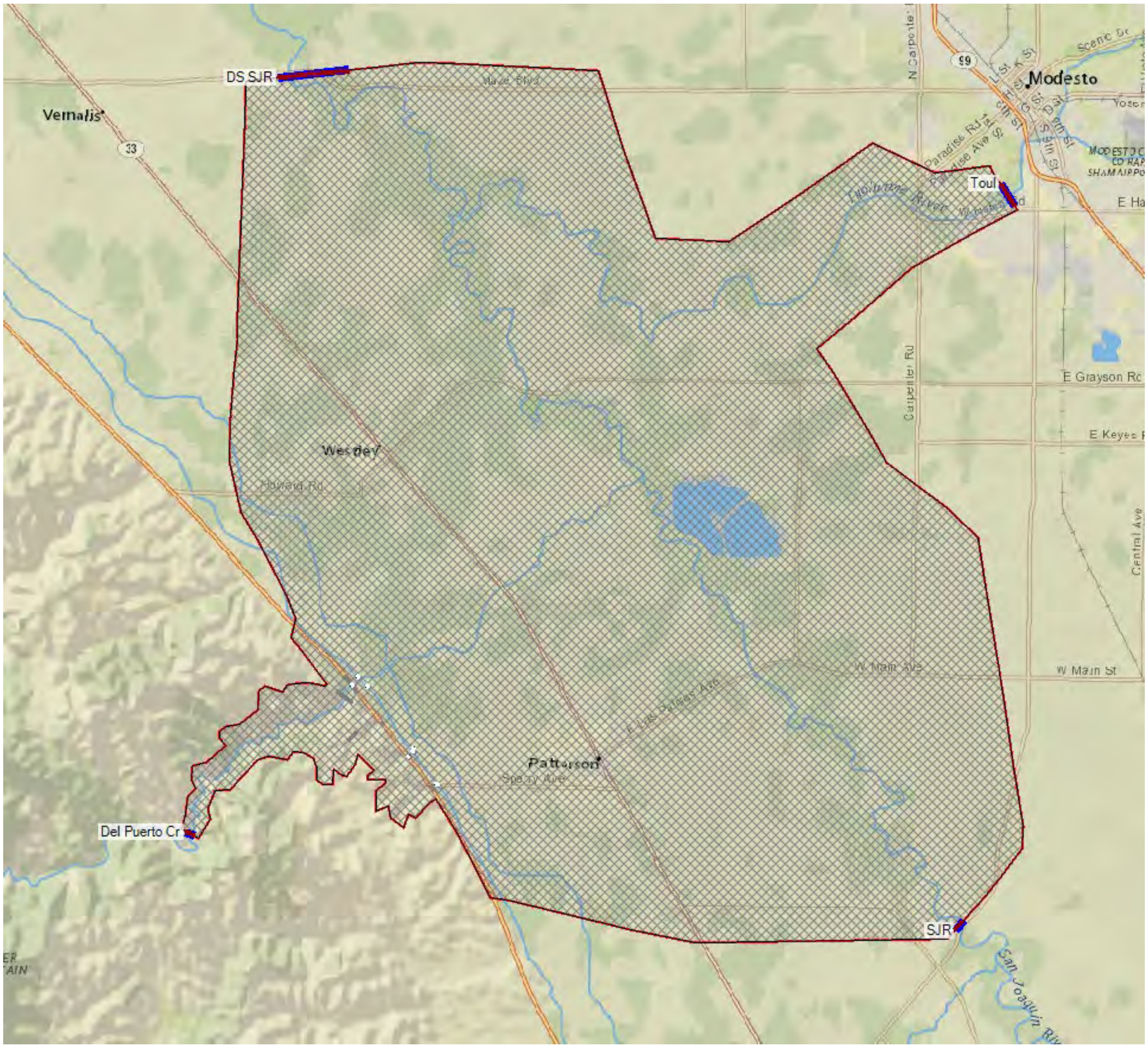


Figure 2: Model domain and boundary condition locations

4 BREACH SIMULATION AND RESULTS

Two scenarios were required to be modeled as part of this study- failure of the Main Dam, and failure of Saddle Dam 1, which DSOD considers a "critical appurtenant structure". Both failure scenarios begin with identical conditions: the proposed Del Puerto Reservoir filled to its normal pool elevation (450 feet), and steady flows as shown in Table 3 in the rivers. The breach is then initiated and grows to its fully developed size over a period of several hours. These details are discussed in the subsections below.

Simulations use the "full momentum" solver scheme with a variable timestep. The floodwave is routed for 96 hours to allow full passage through the model domain. Model run times are approximately 12 hours per scenario.

4.1 Main Dam

Breach parameters for the Main Dam are listed in the table below. A number of parameters must be specified; the values of these parameters are partly left to the user's engineering judgment, partly guided by ranges in literature and various references, and partly specified in 23 CCR § 335.6. Table 4, below, summarizes the breach parameters used in the Main Dam breach simulation, with a note specifying the primary source guiding the selection.

Table 4: Breach parameters for Main Dam

Breach Parameter	Value	Note
Breach bottom elevation	210 feet	Elevation at upstream toe, per 23 CCR § 335.2(a)(2)
Breach bottom width	120 feet	FEMA P-946, Table 9-3; Prof. judgment
Beach side slopes	0.5:1	FEMA P-946, Table 9-3
Breach formation time	3 hours	FEMA P-946, Table 9-3
Breach growth pattern	Sine wave	Prof. judgment

Result indicated that Interstate-5 would be overtopped by dozens of feet; therefore, NHC assumed a cascading breach occurs at Interstate-5 for this preliminary analysis. A similar set of breach parameters, shown in Table 5, was used for Interstate-5. Where judgment enters the selection, NHC selected parameters near the center of the allowable range, skewing slightly less conservative for the Main Dam (due to new construction and known materials) versus slightly more conservative for Interstate-5 due to the unknown nature of the embankment fill materials.

Table 5: Breach parameters for Interstate-5, downstream of Main Dam

Breach Parameter	Value	Note
Breach bottom elevation	196 feet	Elevation at upstream toe, per 23 CCR § 335.2(a)(2)
Breach bottom width	300 feet	FEMA P-946, Table 9-3; Prof. judgment
Beach side slopes	1:1	FEMA P-946, Table 9-3
Breach formation time	2 hours	FEMA P-946, Table 9-3
Breach growth pattern	Sine wave	Prof. judgment

Failures of the two canals were not included at this time. This is discussed further in Section 6.

4.1.1 Results

Inundation extents from the failure of the Main Dam is shown in Figure 3 below.

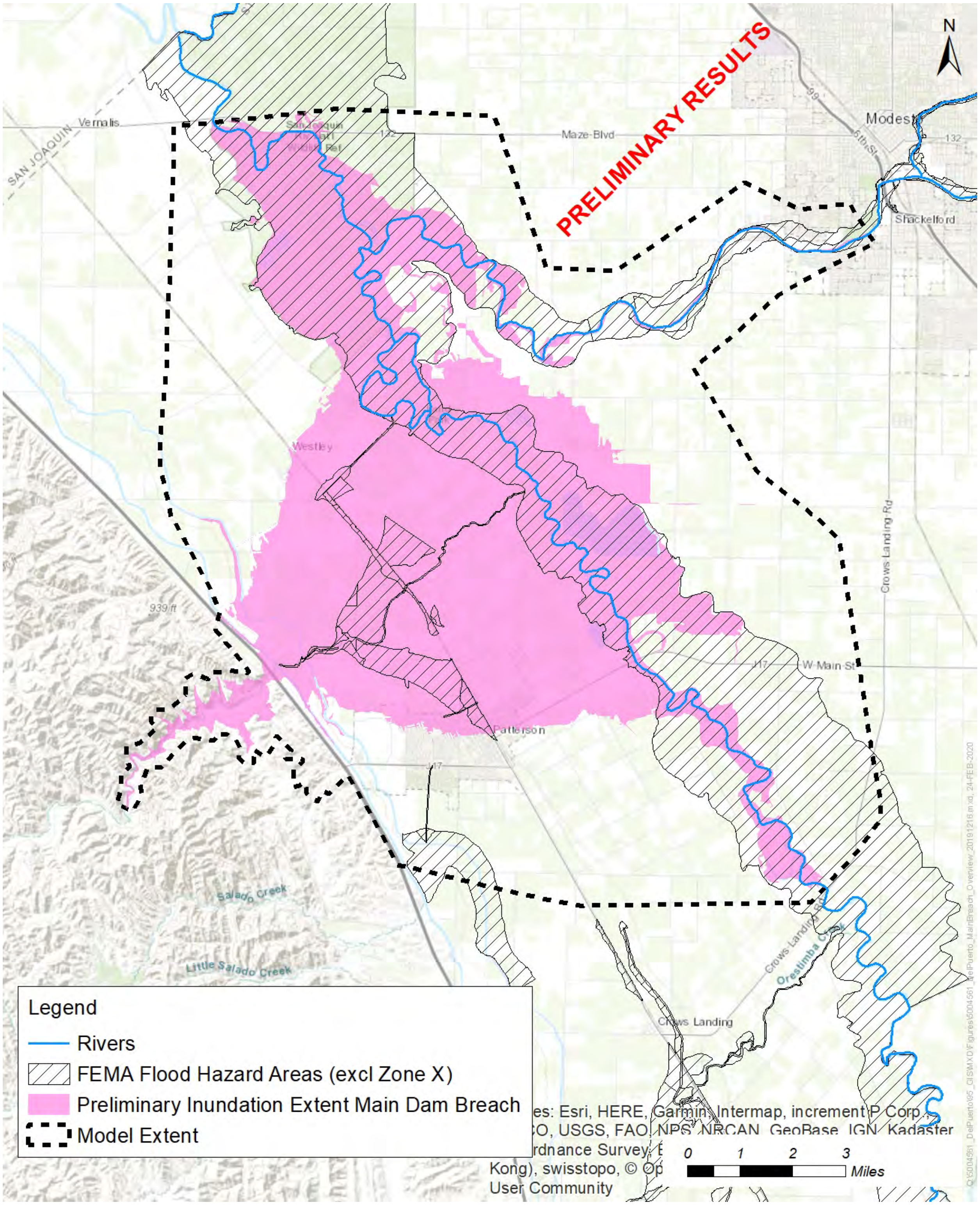


Figure 3: Preliminary inundation extents resulting from hypothetical failure of Del Puerto Main Dam

If a breach in the Main Dam were to occur, outflow from the breach would flow east, overtopping Interstate-5, the California Aqueduct, and the Delta Mendota Canal, reaching east to the San Joaquin River, inundating agricultural lands and portions of the City of Patterson, primarily north of Las Palmas Avenue.

The breach hydrograph is shown in Figure 4. As shown, the peak outflow from a breach of the Main Dam is estimated to be approximately at 800,000 cfs, while the duration of high flows is limited to a few hours. For reference, the probable maximum flood for Del Puerto Creek is approximately 47,400 cfs (NHC, 2019).

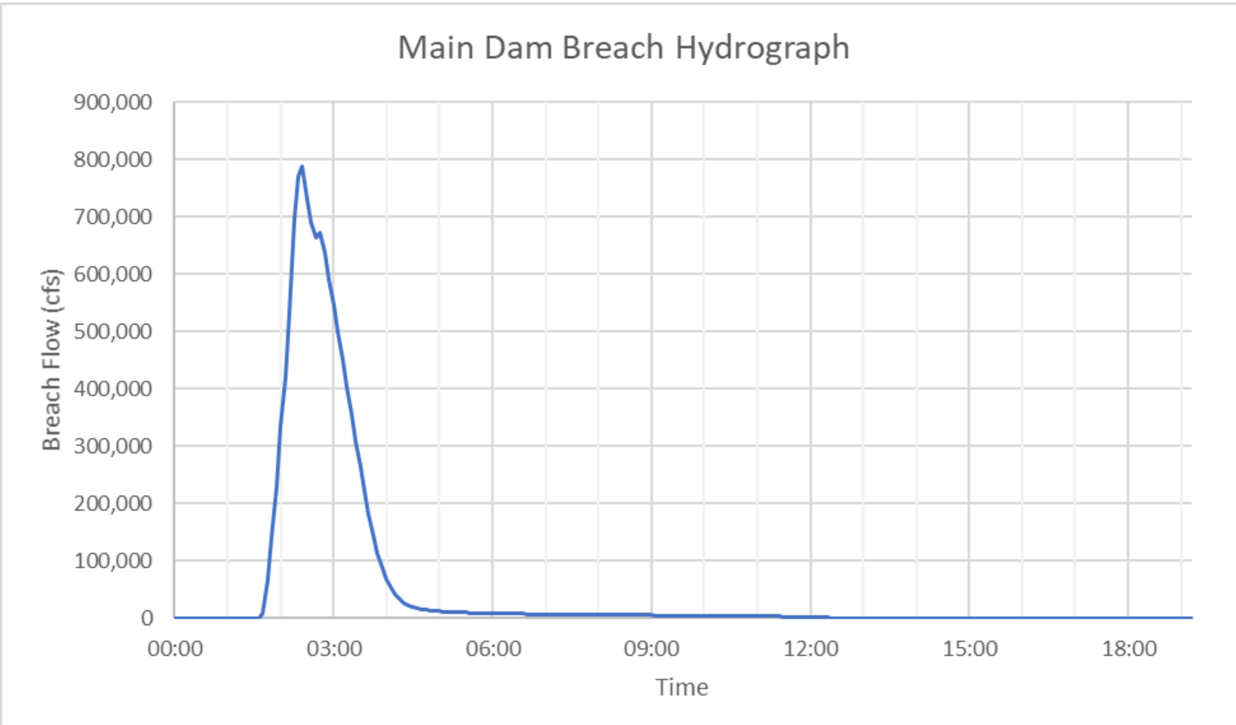


Figure 4: Hydrograph of flows from Main Dam breach (5-minute output interval). Breach initiates at 01:00 and is fully-formed at 04:00.

The flood wave would flow east following Del Puerto Creek and would fan out in the relatively flat terrain east of Interstate-5. The estimated flow velocity at Patterson would be 2-8 feet per second and the maximum depth would be approximately 6 feet. The flood wave would continue east to the San Joaquin River, where it would raise the level of the river by up to 14 feet, before dissipating upstream and downstream within the river.

Figure 5 shows the maximum water surface profile near the breach location to illustrate the depth of floodwater in relation to infrastructure such as Interstate-5 and the two canals.

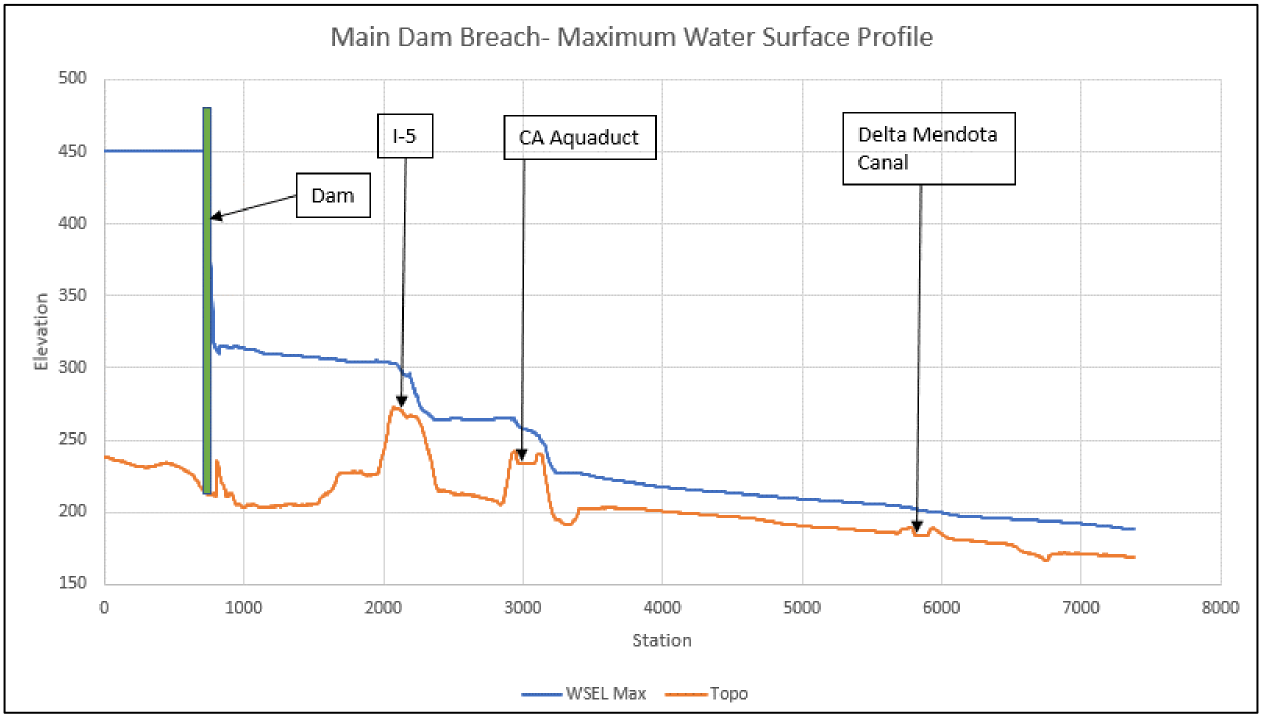


Figure 5: Maximum water surface profile from Main Dam breach, with downstream infrastructure

4.2 Saddle Dam 1

Breach parameters for Saddle Dam 1 are listed in Table 6 below. The breach is wider than the Main Dam breach due to the shape of the valley walls- the Main Dam is in a relatively narrow canyon which will restrict the breach width in that location, while Saddle Dam 1 is located in a more open area that does not have the breach growth constraints.

Table 6: Breach parameters for Saddle Dam 1

Breach Parameter	Value	Note
Breach bottom elevation	340 feet	Elevation at toe, per 23 CCR § 335.2(a)(2)
Breach bottom width	300 feet	FEMA P-946, Table 9-3; Prof. judgment
Beach side slopes	1:1	FEMA P-946, Table 9-3
Breach formation time	2 hours	FEMA P-946, Table 9-3
Breach growth pattern	Sine wave	Prof. judgment

Flows emanating from the Saddle Dam 1 travel southeast and enter several side canyons (shown in Figure 1) leading down to Interstate-5 and the valley bottom. Similar to the Main Dam breach scenario, breaching of Interstate-5 (but not the two canals) was assumed when the interstate embankment is overtopped. This overtopping occurred at the two side canyons closest to Saddle Dam 1 (refer to Figure 1); breach parameters for Interstate-5 at the mouths of these canyons are shown in Table 7 and Table 8 below.

Table 7: Breach parameters for Interstate-5, at mouth of side canyon closest to Saddle Dam 1

Breach Parameter	Value	Note
Breach bottom elevation	300 feet	Elevation at toe, per 23 CCR § 335.2(a)(2)
Breach bottom width	80 feet	FEMA P-946, Table 9-3; Prof. judgment
Beach side slopes	1:1	FEMA P-946, Table 9-3
Breach formation time	2 hours	FEMA P-946, Table 9-3
Breach growth pattern	Sine wave	Prof. judgment

Table 8: Breach parameters for Interstate-5, at mouth of side canyon second closest to Saddle Dam 1

Breach Parameter	Value	Note
Breach bottom elevation	250 feet	Elevation at toe, per 23 CCR § 335.2(a)(2)
Breach bottom width	80 feet	FEMA P-946, Table 9-3; Prof. judgment
Beach side slopes	1:1	FEMA P-946, Table 9-3
Breach formation time	2 hours	FEMA P-946, Table 9-3
Breach growth pattern	Sine wave	Prof. judgment

4.2.1 Results

Inundation extents resulting from a failure of Saddle Dam 1 are shown in Figure 6.

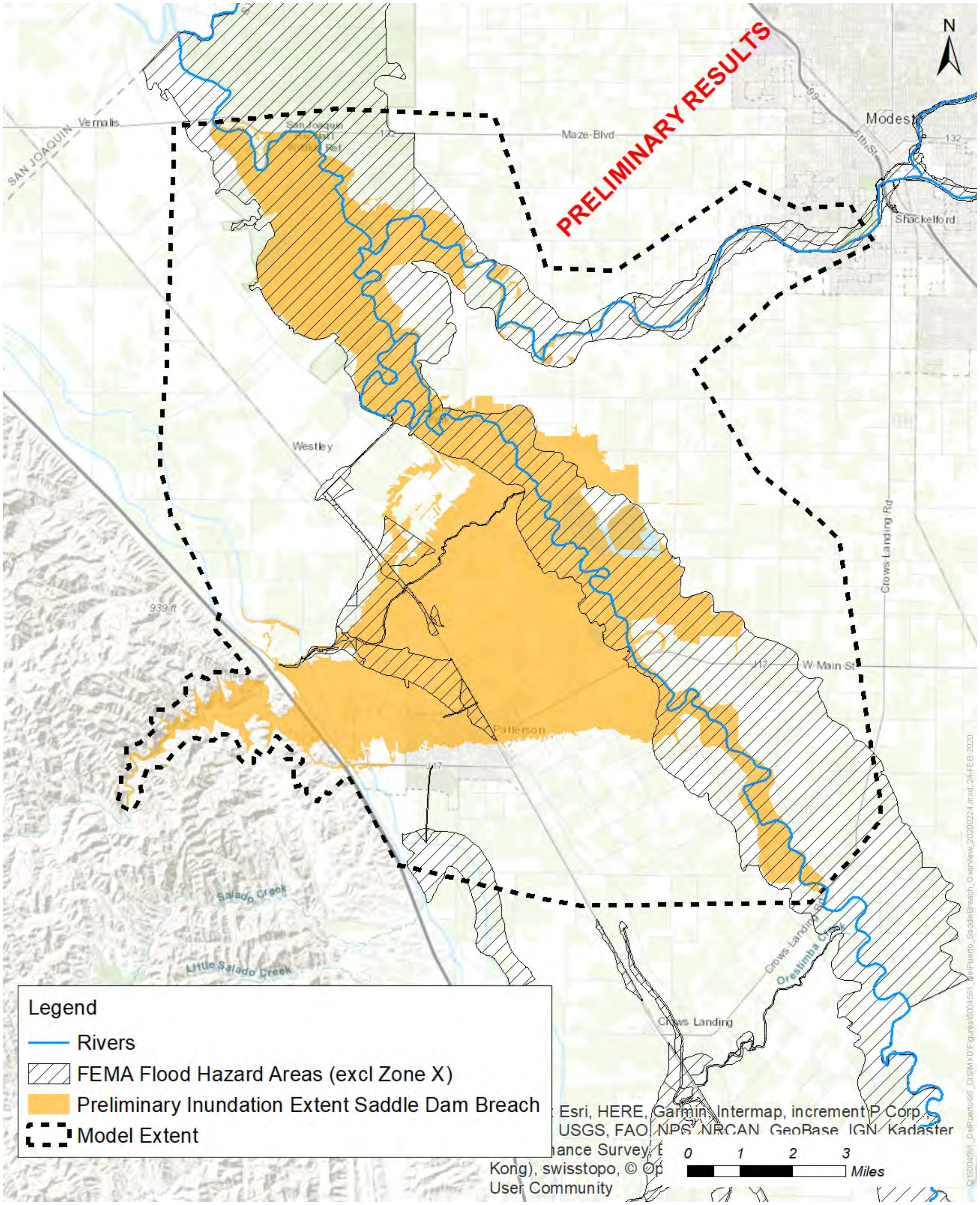


Figure 6: Preliminary inundation extents resulting from hypothetical failure of Del Puerto Saddle Dam 1

If the Saddle Dam 1 breach were to occur, outflow from the breach would flow south and down several side canyons to Interstate-5, and then east, encountering the California Aqueduct, the Delta Mendota Canal, and eventually the San Joaquin River. At the side canyon closest to Saddle Dam 1, I-5 would overtop by approximately 20 feet. At the next side canyon south, I-5 would overtop by approximately 6 feet. At the third and furthest side canyon south of Saddle Dam 1, the floodwave would not overtop I-5. Agricultural lands and portions of the City of Patterson, primarily the northern half of the City, would be inundated as well.

The breach hydrograph for the Saddle Dam 1 breach scenario is shown in Figure 7. As indicated in the figure, the peak outflow from a breach of the Saddle Dam 1 is estimated to be approximately 500,000 cfs. The reservoir is evacuated down to elevation 366 feet (the elevation of a natural saddle in the downstream flow path) over a period of a few hours.

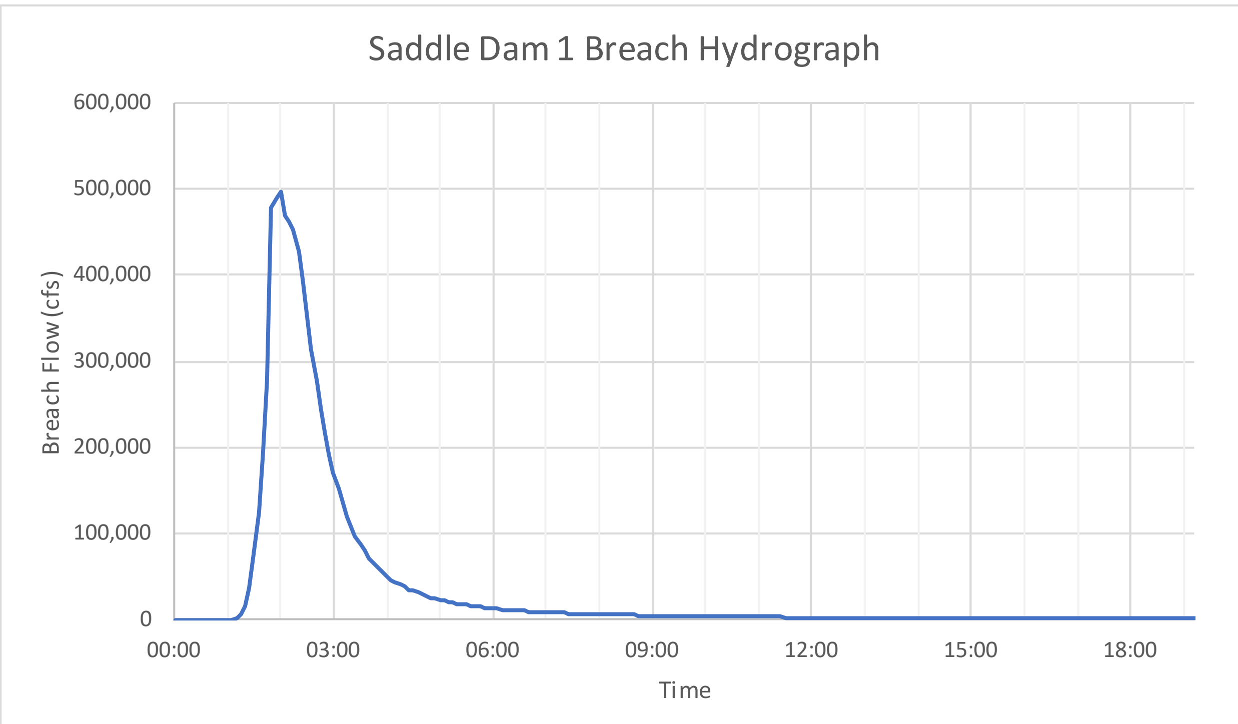


Figure 7: Hydrograph of flows from Saddle Dam 1 breach (5-minute output interval). Breach initiates at 01:00 and is fully-formed at 03:00

As flood wave travels down the side canyons it would overtop and breach Interstate-5 in the two canyons closest to the Saddle Dam 1. At the furthest side canyon from the dam, water would pond behind the Interstate-5 embankment but not overtop the highway. The estimated flow velocity at Patterson would be 2-9 feet per second and the maximum depth would be approximately 10 feet. The flood wave would continue east to the San Joaquin River, where it would raise the level of the river by up to approximately 12-13 feet, before dissipating upstream and downstream within the river.

4.3 Results Validation and Sensitivity

It is somewhat difficult to determine how realistic results may be from a model of a catastrophic dam failure, as there is no way to predict exactly what the failure will look like. One way to address this uncertainty is through sensitivity tests. NHC re-simulated the Saddle Dam 1 failure with smaller, slower forming breach to test the impact on flood extents and thus impacted parties. The inundation extents were not sensitive to this change, which increases our confidence in the preliminary inundation mapping.

Peak outflows were checked for reasonableness by comparing model results to a range of estimates from regression equations developed from a variety of means- from small scale experiments to analysis of databases containing data on dozens of real-world dam failures. The regression equations predict peak outflows ranging from 480,000 cfs to approximately 2,000,000 cfs for the Main Dam, compared to the model results of 800,000 cfs. The peak outflows are within the range of expected values for a dam of this size and shape.

5 PROBABLE MAXIMUM FLOOD WITHOUT DAM SCENARIO

Woodard & Curran directed NHC to use the model developed for the dam breach analysis, and described above, to also simulate the case of a probable maximum flood (PMF) scenario that occurs in the absence of the proposed dam. It is important to recognize that the model was not developed with this purpose in mind, and smaller flows than those found in a dam breach require more detail to simulate with the level of accuracy needed to develop flood maps for publication. Nonetheless, this exercise does help illuminate broad trends in the areas at risk of flooding in the extremely unlikely PMF scenario, as a comparison to the areas at risk in the also extremely unlikely dam breach scenario.

NHC developed a PMF hydrograph for Del Puerto Creek under a separate task order, the results of which are documented in NHC (2019). The estimated peak inflow to the reservoir was found to be 47,400 cfs. The full PMF hydrograph is shown in Figure 8.

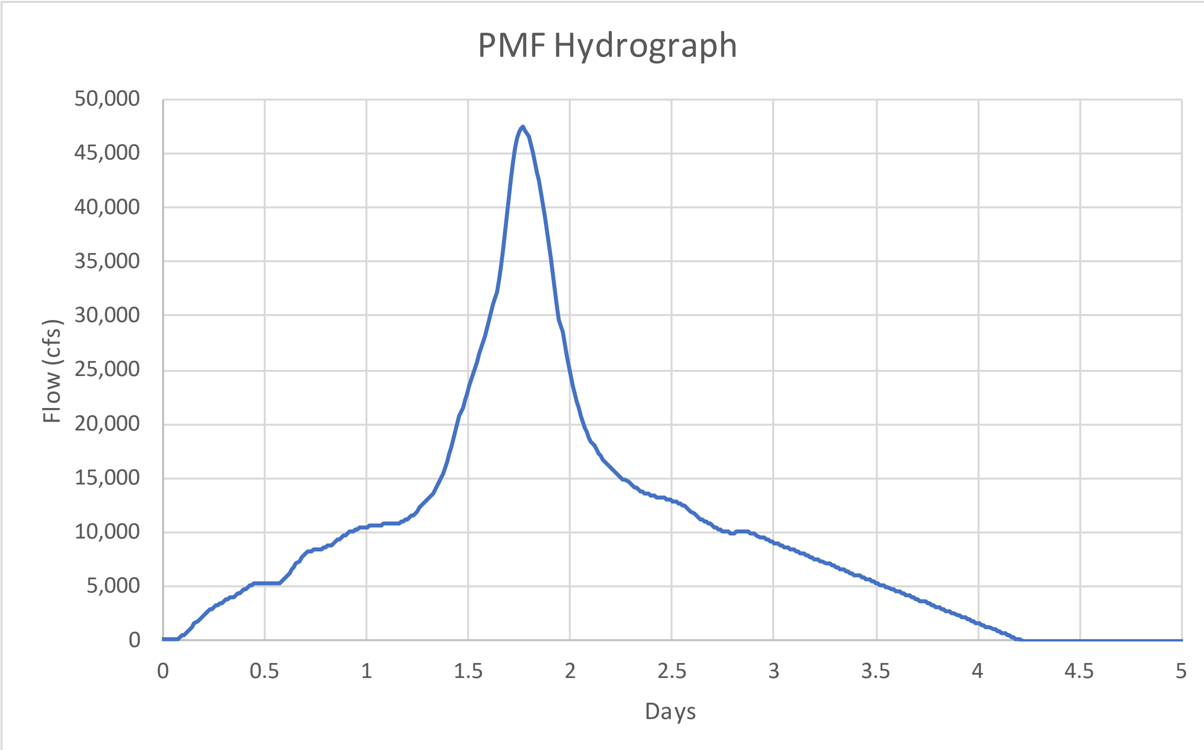


Figure 8: PMF hydrograph from NHC (2019).

The only modifications made to the model for the simulation of the PMF include:

- Removal of proposed dam structure and associated roughness characteristics (i.e., return to existing conditions geometry)
- Move inflow boundary so that PMF inflow boundary condition location coincides with NHC (2019) reporting location

The PMF was routed through Del Puerto Canyon and across the valley floor. Interstate 5 was overtopped in this simulation, but only by approximately 1-2 feet and for a relatively short period of time. For this reason, a breach of Interstate 5 was not included in the results discussed herein.

The inundation extents of the PMF Without Dam scenario are shown in Figure 9.

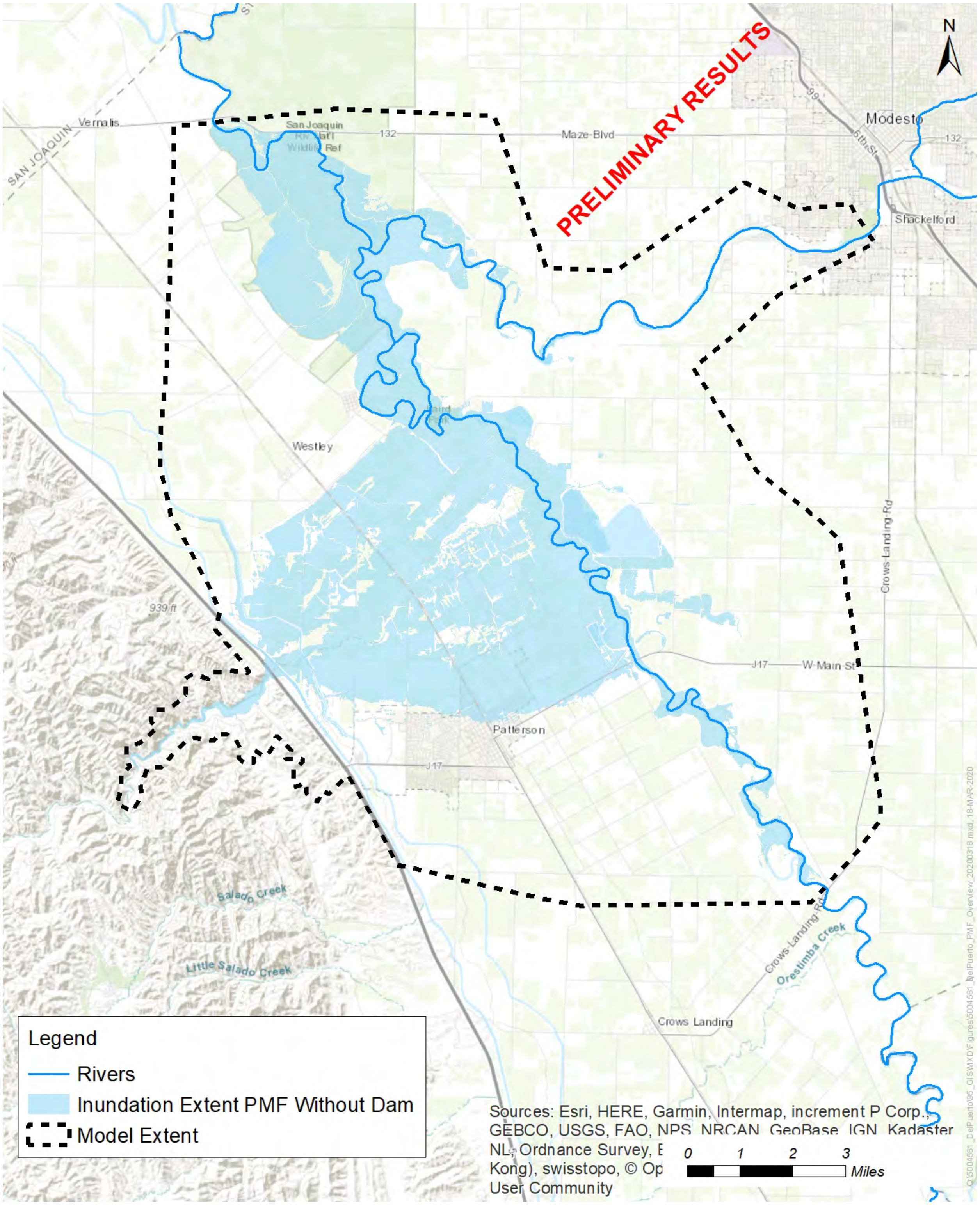


Figure 9:Extents of flooding in PMF Without Dam scenario

Maximum depths from the PMF are considerably less than in either dam breach scenario, but overall flooding extents are comparable. This is attributed to the relatively flat terrain that is conducive to flows fanning out. The reduced depths are a direct result of the differencing in volumes between simulations. The peak flow of the PMF (47,400 cfs) is only 5-10% of the peak breach flow values of 800,000 cfs and 500,000 cfs emanating from the Main Dam and Saddle Dam 1, respectively.

6 NEXT STEPS

Preliminary results from this analysis have been provided to Woodard & Curran for use in the EIR/EIS document. The results provide an approximate potential dam inundation impact for the facility using the available concept level plans.

After discussion with DSOD, NHC and Woodard & Curran have collectively decided to pause the dam breach analysis until the dam design advances to at or near final design. Prior to DSOD mapping the models will be finalized to reflect any adjustments to the design as well as any refinement of modeling parameters or assumptions from discussion with the design team and DSOD.

In addition to representing any design changes at the dam site within the model, NHC will likely need to represent the San Joaquin River in a more sophisticated manner. The representation of the river currently lacks bathymetry, since the surface was developed from LiDAR. The model also likely needs to be expanded further down the San Joaquin River to fully dissipate the floodwave. Ideally this would be done using a previously accepted DSOD, DWR or FEMA hydraulic model of the San Joaquin River. A major factor in model expansion is the size of the floodwave, which depends largely on the reservoir volume, so the pool level of the reservoir should be confirmed before effort is expended expanding the model.

The consultant team should coordinate with DSOD on the failure assumptions to use for the California Aqueduct and Delta Mendota Canal. The proposed failure assumptions for Interstate-5 will be also be reviewed. Failure of the Aqueduct and Canal are not currently included in the modeling.

Lastly, inundation mapping to DSOD standards will be required for the final design. The guidelines in place have only been used for existing facilities to date. Since the maps are a derivative product of the design rather than a driver of the design, and require significant effort to prepare, it is logical to hold off on this work until the dam design is finalized, or DSOD requests draft mapping.

7 REFERENCES

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Sincerely,

Northwest Hydraulic Consultants Inc.

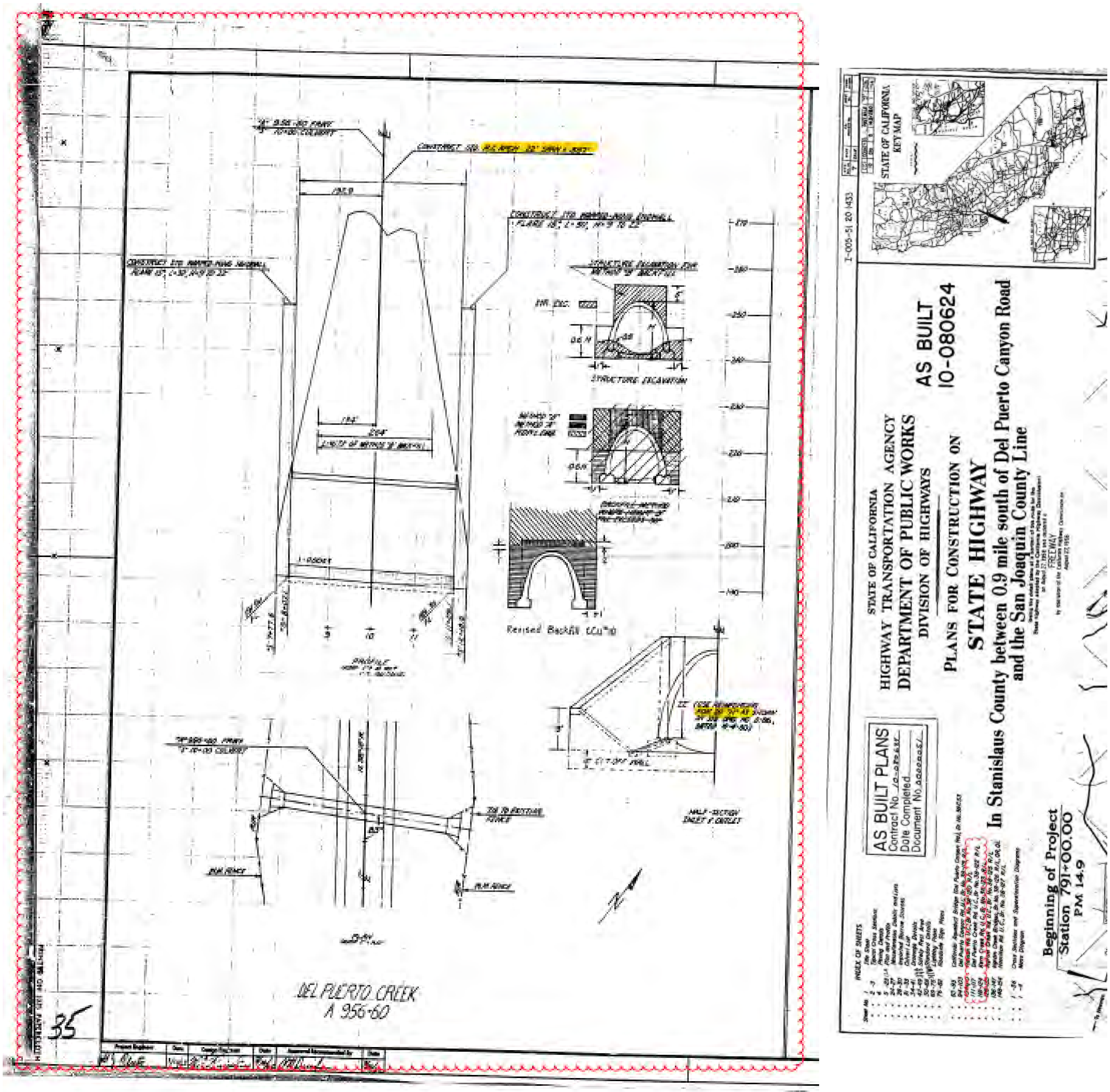
Alex Anderson, PE
Senior Engineer

Brady McDaniel, PE
Principal

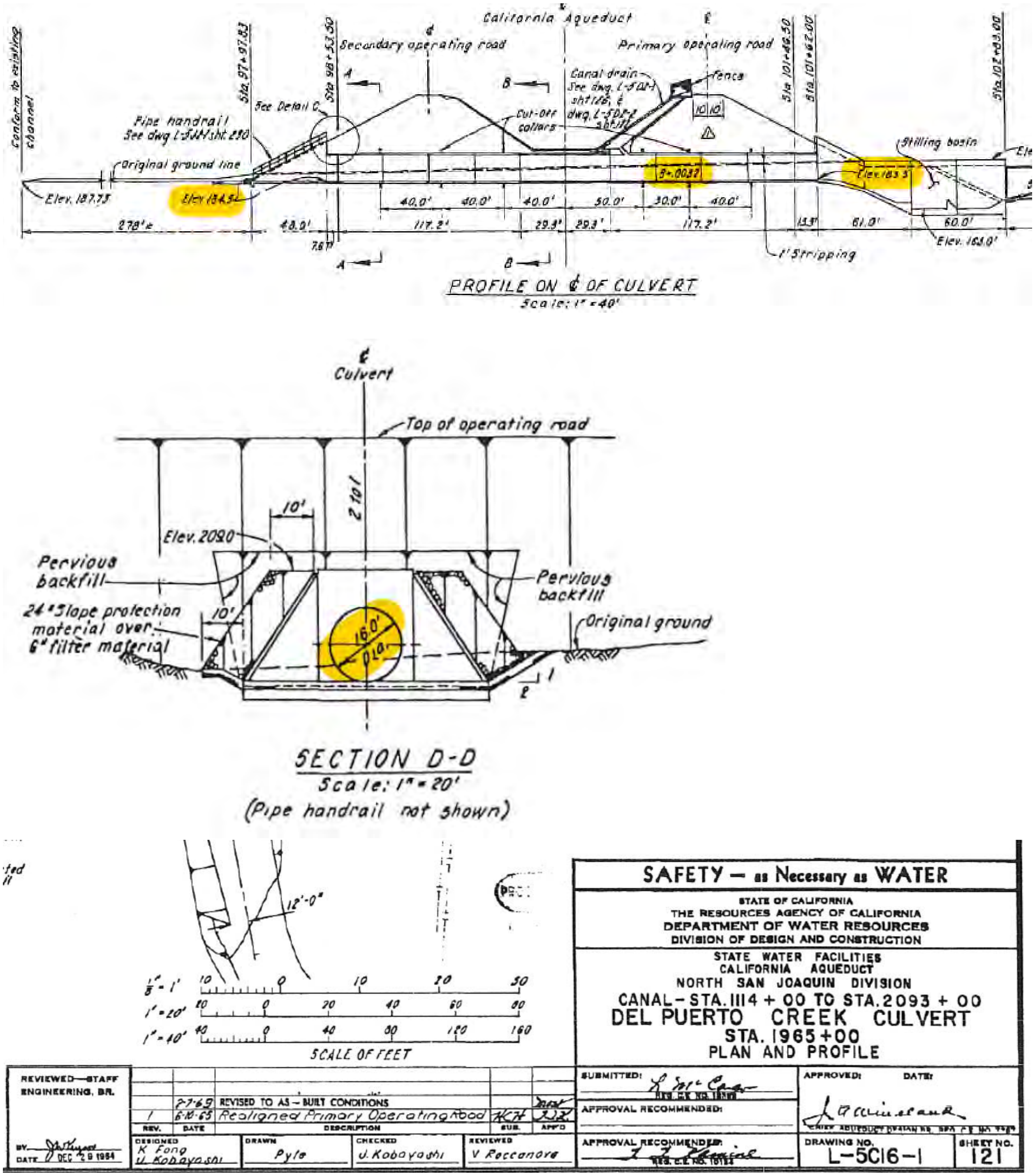
Appendix A

Bridge and Culvert Plan Information

Culvert A: Del Puerto Creek under I-5. As-built planset:



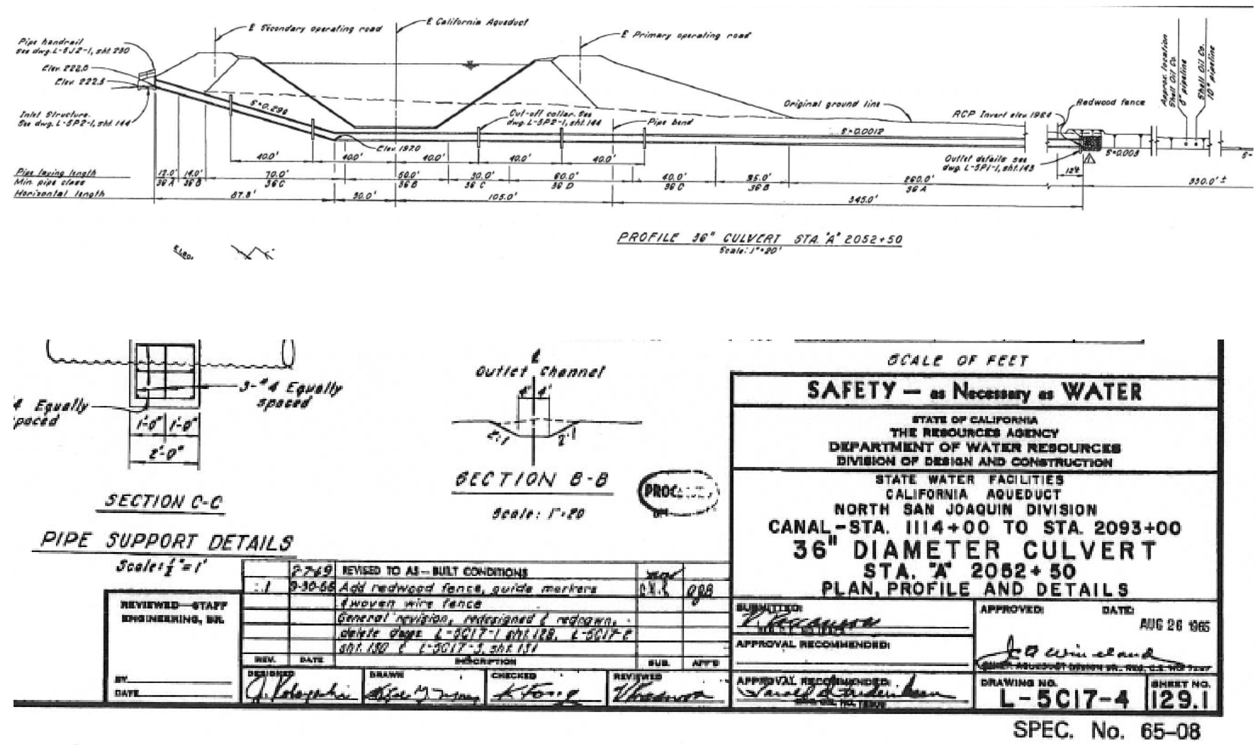
Culvert B: Del Puerto Creek under CA Aqueduct. Design plans:



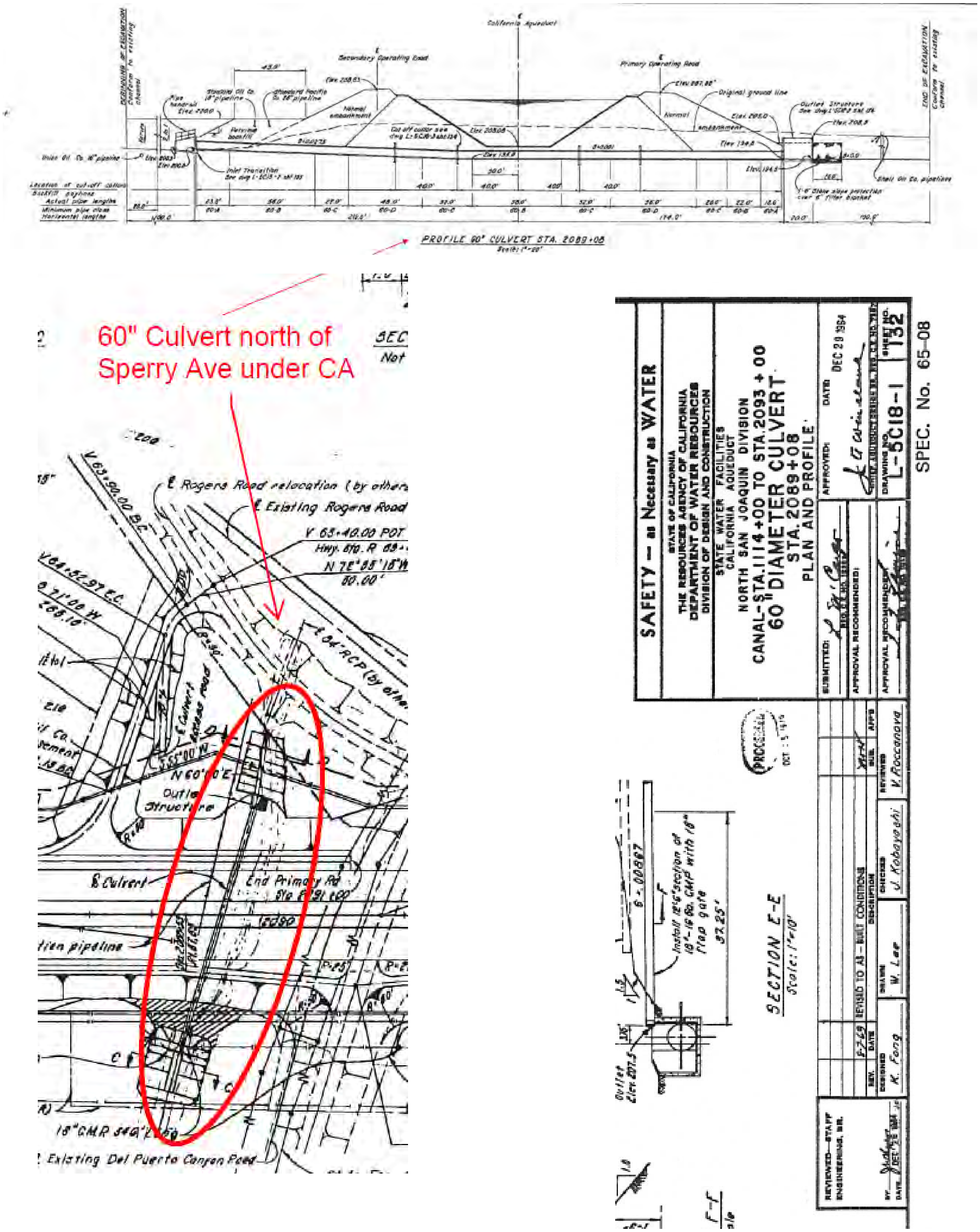
Culvert C: No plans available. Assumed dimensions based on size of ditch in topo and imagery in Google Maps.

Culvert D: No plans available. Assumed same dimensions as downstream culvert “E”

Culvert E: 36” culvert under CA Aqueduct about ¾ mile northwest of Sperry Rd Bridge



Culvert F: 60" culvert under CA Aqueduct at Sperry Road



APPENDIX I: **Mitigation Monitoring and Reporting Program**

Mitigation Monitoring and Reporting Plan

The Del Puerto Water District and San Joaquin River Exchange Contractors Water Authority (Exchange Contractors), working together as Project Partners, are proposing to construct and operate the Del Puerto Canyon Reservoir (DPCR). The Del Puerto Water District is the CEQA Lead Agency for completion of the Environmental Impact Report and the San Joaquin River Exchanges Contractors Water Authority is a Responsible Agency working with the Lead Agency to build and operate the project. This MMRP provides a plan for implementation of mitigation measures that pertain to the proposed project.

The MMRP contains all of the mitigation measures that were presented in the Draft EIR, with some minor modifications based on comments received from agencies during public review of the Draft EIR. The table is organized by Mitigation Measure and because some measures address several different impacts, multiple impacts may be listed in the Impact Statement, where applicable.

Mitigation measures have been included in the project to reduce or avoid potential environmental impacts associated with project construction and operation. Section 21081.6 of the California Public Resources Code requires a CEQA lead or responsible agency that approves or carries out a project where an EIR has identified measures to mitigate significant environmental effects to adopt a "reporting monitoring program for adopted or required changes to mitigate or avoid significant environmental effects." In accordance with Section 21081.6 of the Public Resources Code, this MMRP has been prepared.

Impact Statement	Mitigation Measure (Exact Text)	Party Responsible for Implementation and Reporting	Review and Approval by:	Monitoring and Reporting Actions	Implementation Schedule -Design -Pre-construction -Construction -Operation	Verification: Status/ Date Completed/ Initials
Aesthetics						
AES-1: Substantial Damage to Scenic Resources within a State Scenic Highway and Substantial Degradation of Existing Visual Character or Quality, or a Substantial Adverse Effect on a Scenic Vista	**AES-1: Implement Color Palette Consistent with Existing Environment** The pumping plant's above-grade structures shall be painted a matte color consistent with the area's visual aesthetic, generally matte tan or light brown. Roofing for above-grade structures shall be matte as well to minimize potential glare.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors	1. Confirm that color palette requirements are included in plans and specifications. 2. Confirm above grade structures are painted appropriately with suitable roofing material. Document compliance and retain in project file.	1. Design 2. Construction	1.________ 2.________
AES-2: New Sources of Substantial Light or Glare	**AES-2: Nighttime Construction Lighting** Nighttime construction lighting shall be shielded and oriented downward to minimize effects on any nearby receptors including habitat for wildlife species. Lighting shall be directed toward active construction areas only and shall have the minimum brightness necessary to ensure worker safety.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors	1. Confirm that lighting measures are included in specifications. 2. Monitor construction activities to verify that measures are implemented during construction. Document compliance and retain in project file.	1. Design 2. Construction	1.________ 2.________
AES-2: New Sources of Substantial Light or Glare	**AES-3: Directional Lighting for Dam Control Building, Inlet/Outlet Works Control Building and Bifurcation Structure in Unincorporated Stanislaus County** Nighttime lighting for the main dam's control building, the inlet/outlet control building, and bifurcation structure shall be equipped with directional shields that aim light downward and away from adjacent roadways and adjacent undeveloped areas that may provide habitat for wildlife species. In addition, the placement of lighting fixtures would be selected to concentrate light on-site to avoid spillover.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors	1. Confirm that lighting measures are included in plans and specifications for structures. 2. Confirm lighting is installed properly. Document compliance and retain in project file.	1. Design 2. Construction	1.________ 2.________

Impact Statement	Mitigation Measure (Exact Text)	Party Responsible for Implementation and Reporting	Review and Approval by:	Monitoring and Reporting Actions	Implementation Schedule -Design -Pre-construction -Construction -Operation	Verification: Status/ Date Completed/ Initials
Air Quality and Energy						
AIR-2: Increase of Nonattainment Criteria Pollutants AIR-3: Sensitive Receptors ENE-1: Inefficient, Wasteful, Or Unnecessary Use of Energy Resources	**AIR-1: Reduce NOx Emissions** NO_X emissions associated with construction activities shall be reduced to 10 tons per year through on-site equipment and hauling vehicle mitigation measures to the extent feasible. All vehicles and equipment used during construction shall be maintained and properly tuned in accordance with the manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation. Emissions reduction methods may be chosen from any combination of the following measures: • Use of alternative fueled vehicles • Use of newer tier engines • Use of phased material hauling trips • Use of after-market pollution control devices to reduce emissions • Lengthening the construction schedule to reduce the annual intensity of construction activities After certification of the DEIR, but before emissions associated with proposed project activities begin, the Del Puerto Water District and Exchange Contractors shall be responsible for producing a SJVAPCD-approved air quality impact assessment analysis to determine the projected maximum project emissions which incorporates the most current proposed equipment fleet, hours of operation, duration of work, and on-site NO_X reduction measures, based on final project design and phasing. If all feasible on-site measures have been implemented and annual emissions are anticipated to still be above 10 tons per year for NO_X, then the Project Partners shall enter into a Voluntary Emissions Reduction Agreement (VERA) with SJVAPCD. The VERA would provide pound-for-pound mitigation of air emissions increases down to a net zero emissions per year as required under general conformity through a process that develops, funds, and implements emission reduction projects. To ensure emission reductions targeted by the VERA occur at the same time as project emissions, and thereby achieve net zero annual emissions, the Project Partners shall enter into a VERA with SJVAPCD prior to the release of NO_X emissions associated with proposed project activities. SJVAPCD would serve as administrator of the emissions reduction projects and verifier of the successful mitigation effort. Under the VERA, the Project Partners shall agree to mitigate project-specific emissions by providing funds for the SJVAPCD's Emission Reduction Incentive Program (ERIP). The funds would be disbursed by ERIP in the form of grants for projects that achieve emission reductions. Types of emission reduction projects that have been funded in the past include electrification of stationary internal combustion engines (such as agricultural irrigation pumps), replacing old heavy-duty trucks with new, cleaner, more efficient heavy-duty trucks, and replacement of old farm tractors. The Project Partners would request that funding disbursement priority would be given to emission reduction projects of Partner landowners. The initial agreement would generally be based on the projected maximum emissions increases as calculated by a SJVAPCD-approved air quality impact assessment and contain the corresponding maximum fiscal obligation. However, because the goal is to mitigate actual emissions, the SJVAPCD has designed flexibility into the VERA such that the final mitigation would be based on actual emissions related to the project as determined by actual equipment used, hours of operation, and duration of work. After the project is mitigated, the SJVAPCD would certify to the lead agency that the mitigation is completed, providing the lead agency with an enforceable mitigation measure demonstrating that project-specific emissions have been mitigated to less than significant.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors, SVJAPCD	1. Confirm that air quality measures are included in specifications. 2. Update emissions estimates and submit air quality impact assessment to SJVAPCD; if needed implement VERA. 3. Monitor construction activities to verify that measures are implemented during construction. Document compliance and retain in project file.	1. Design 2. Pre-construction 3. Construction	1.________ 2.________ 3.________

Impact Statement	Mitigation Measure (Exact Text)	Party Responsible for Implementation and Reporting	Review and Approval by:	Monitoring and Reporting Actions	Implementation Schedule -Design -Pre-construction -Construction -Operation	Verification: Status/ Date Completed/ Initials
Biological Resources						
BIO-TERR-1: Substantial adverse effect on candidate, sensitive or special status species	**BIO-TERR-1a Avoid and Minimize Impacts on Biological Resources** The Project Partners shall incorporate the following measures into construction plans. • Employees and contractors performing construction and decommissioning activities will receive environmental sensitivity training. Training will include review of environmental laws, mitigation measures, permit conditions, and other requirements that must be followed by all personnel to reduce or avoid effects on biological resources during construction activities. • Vehicles and equipment will be parked on pavement, existing roads, and previously disturbed areas to the extent practicable. • Offroad vehicle travel will be avoided outside of the construction footprint. • Grading will be restricted to the minimum area necessary. • Prior to ground-disturbing activities, sensitive habitats will be flagged by a USFWS and CDFW approved biologist and temporary fencing will be in place during construction to reduce the potential for vehicles and equipment to stray into these areas. • Vehicles or equipment will not be refueled within 100 feet of a wetland, stream, or other waterway unless a bermed and lined refueling area (i.e., a created berm made of sandbags or other removable material) is constructed. • Erosion control measures will be implemented to reduce sedimentation in nearby aquatic habitat when activities are the source of potential erosion. Plastic monofilament netting (erosion control matting) or similar material containing netting will not be used at the project site. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds. • The following will not be allowed at or near work sites for project activities: trash dumping, firearms, open fires (such as barbecues), hunting, and pets. • First- and second-generation rodenticides will not be used within the project site except for the limited use of zinc phosphide, or a rodenticide allowed for use by the California Department of Pesticide Regulation. • An approved biologist will be on site during initial ground-disturbing activities within and adjacent to grassland areas and during the removal of any trees. The biologist will assist the crew, as needed, to comply with all project implementation restrictions and guidelines. In addition, the biologist will be responsible for ensuring that contractors maintain exclusion areas adjacent to sensitive biological resources, and for documenting compliance with all biological resources–related mitigation measures.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors	1. Verify training requirements and general restrictions and guidelines are incorporated into project specifications. 2. Verify that specifications include requirements for sensitive habitat avoidance. 3. Confirm training has been completed. 4. Confirm that biologist is on site for initial ground disturbing activities. 5. Confirm that construction personnel comply with required procedures. Document compliance and retain in project file.	1. Design 2. Design 3. Pre-construction 4. Construction 5. Construction	1.________ 2.________ 3.________ 4.________ 5.________

Impact Statement	Mitigation Measure (Exact Text)	Party Responsible for Implementation and Reporting	Review and Approval by:	Monitoring and Reporting Actions	Implementation Schedule -Design -Pre-construction -Construction -Operation	Verification: Status/ Date Completed/ Initials
BIO-TERR-1: Substantial adverse effect on candidate, sensitive or special status species	**BIO-TERR-1b: Avoid and Compensate for Adverse Effects on Special-Status Plant Species** Because the 2020 spring botanical surveys were inconclusive for several special-status plants that grow in grasslands, surveys of the grasslands must be conducted for special-status plants, prior to the start of any proposed project activities, by qualified botanists in accordance with the appropriate protocols. The surveys shall be conducted in accordance with Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities (California Department of Fish and Wildlife 2018c) during the season that special-status plant species would be evident and identifiable, which generally is during their blooming season. The surveys shall be conducted within no more than 3 years prior to the start of ground-disturbing activities. The results of the survey shall be submitted to DPWD and CDFW for review no less than 1 year prior to the start of ground-disturbing activities. The report will include the location and description of all proposed work areas and the location and description of all occupied habitat for special-status plant species, and it will identify locations where effective avoidance measures could be implemented. In areas where no special-status plant species are present no further mitigation would be required. Where surveys determine that a special-status plant species is present in or adjacent to a project area where temporary ground-disturbing activities would take place, project impacts on the species shall be avoided through the establishment of activity exclusion zones, within which no ground-disturbing activities will take place, including construction staging, or other temporary work areas. Activity exclusion zones for special-status plant species shall be established around each occupied habitat site, the boundaries of which shall be clearly marked with standard orange plastic construction exclusion fencing or its equivalent. The establishment of activity exclusion zones shall not be required if no construction-related disturbances will occur within 250 feet of the occupied habitat. The size of activity exclusion zones may be reduced through consultation with a qualified biologist and with concurrence from CDFW based on site-specific conditions. Prior to any activities that would result in permanent impacts on special-status plants, compensation habitat for each affected species shall be acquired and permanently protected at a ratio of 2 acres protected for every 1 acre that would be lost. Compensation habitat shall consist of existing, off-site occupied habitat acquired in-fee, through conservation easements, or from a certified conservation bank. The compensation habitat shall be monitored annually to verify that the habitat suitability is maintained. An operations and management plan shall be prepared and implemented for each compensation habitat, with funding provided through an endowment, to monitor the habitat and determine and implement appropriate management measures to maintain the habitat. Annual monitoring reports shall be submitted to CDFW for review and determination that the project remains in compliance with the mitigation.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors, CDFW	1. Verify completion of special-status plant surveys. 2. Confirm establishment of exclusion zones to protect sensitive plants in or adjacent to temporary work areas. 3. Confirm acquisition of compensation habitat for any permanent impacts. 4. If compensation habitat is managed by Project Partners, confirm submittal of annual monitoring reports to CDFW. Mitigation bank operator(s) shall be responsible for monitoring if compensation habitat is obtained from certified conservation bank. Document compliance and retain in project file.	1. Design 2. Pre-construction 3. Pre-Construction 4. Operation	1.________ 2.________ 3.________ 4.________
BIO-TERR-1: Substantial adverse effect on candidate, sensitive or special status species	**BIO-TERR-1c: Compensate for the loss of habitat occupied by vernal pool fairy shrimp and/or vernal pool tadpole shrimp** At least one year prior to impacting any of the potential vernal pool branchiopod habitat, a biologist with a 10(a)(1)(A) recovery permit for vernal pool branchiopods shall conduct protocol level surveys for federally listed vernal pool branchiopods following the USFWS's 2015 Survey Guidelines for the Listed Large Branchiopods. These surveys require the completion of one dry season survey and one wet season survey. If no federally listed branchiopods are present, no further mitigation would be required other than requirements under federal and state laws protecting wetlands. If federally listed branchiopods are determined to be present and are located in permanent disturbance areas then the Project Partners shall compensate for the loss of federally listed vernal pool branchiopod habitat through the purchase of credits from a USFWS approved mitigation bank at a conservation acreage of 2:1 protection and 1:1 restoration.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors, USFWS	1. Verify completion of surveys. 2. If necessary, confirm acquisition of mitigation bank credits for any permanent impacts. Document compliance and retain in project file.	1. Design 2. Pre-construction	1.________ 2.________

Impact Statement	Mitigation Measure (Exact Text)	Party Responsible for Implementation and Reporting	Review and Approval by:	Monitoring and Reporting Actions	Implementation Schedule -Design -Pre-construction -Construction -Operation	Verification: Status/ Date Completed/ Initials
BIO-TERR-1: Substantial adverse effect on candidate, sensitive or special status species	**BIO-TERR-1d: Avoid, Minimize, and Compensate for Impacts of Valley Elderberry Longhorn beetle**: _Preconstruction Exit Hole Surveys_ Prior to filling the reservoir, elderberry shrubs in the inundation footprint shall be surveyed for exit holes following the guidance in the USFWS's Framework to determine if they have potentially become occupied by valley elderberry longhorn beetle. _Avoidance and Minimization Measures_ The following measures come from the USFWS's 2017 Framework and are intended to be implemented where project construction occurs within 165 feet of elderberry shrubs, which currently is limited to one shrub near where the new road alignment ties back into the existing Del Puerto Canyon Road. • Fencing. All areas to be avoided during construction activities will be fenced and/or flagged as close to construction limits as feasible. • Avoidance area. Activities that may damage or kill an elderberry shrub (e.g., trenching, paving) may need an avoidance area of at least 6 meters (20 feet) from the drip-line, depending on the type of activity. • Worker education. A qualified biologist will provide training for all contractors, work crews, and any onsite personnel on the status of the VELB, its host plant and habitat, the need to avoid damaging the elderberry shrubs, and the possible penalties for noncompliance. • Construction monitoring. A qualified biologist will monitor the work area at project-appropriate intervals to assure that all avoidance and minimization measures are implemented. The amount and duration of monitoring will depend on the project specifics and will be discussed with the Service biologist. • Timing. As much as feasible, all activities that could occur within 50 meters (165 feet) of an elderberry shrub, will be conducted outside of the flight season of the VELB (March - July). • Trimming. Trimming may remove or destroy VELB eggs and/or larvae and may reduce the health and vigor of the elderberry shrub. In order to avoid and minimize adverse effects to VELB when trimming, trimming will occur between November and February and will avoid the removal of any branches or stems that are ≥ 1 inch in diameter. Measures to address regular and/or large-scale maintenance (trimming) shall be established in consultation with USFWS. • Chemical Usage. Herbicides will not be used within the drip-line of the shrub. Insecticides will not be used within 30 meters (98 feet) of an elderberry shrub. All chemicals will be applied using a backpack sprayer or similar direct application method. 12 Mowing. Mechanical weed removal within the drip-line of the shrub will be limited to the season when adults are not active (August - February) and will avoid damaging the elderberry. • Erosion Control and Re-vegetation. Erosion control will be implemented and the affected area will be re-vegetated with appropriate native plants. _Compensation_ If no occupied shrubs would be lost, no further mitigation would be required. If shrubs determined to be occupied by valley elderberry longhorn beetle are lost due to project construction and/or inundation, the Project Partners shall compensate for the loss of individual shrubs by purchasing credits at a USFWS approved mitigation bank. Per the USFWS 2017 Framework, those shrubs that can be transplanted (i.e., those not on cliffs and those that are likely to withstand transplantation) will also be moved to the USFWS approved mitigation bank. The specific location for the mitigation will be developed during Reclamation's consultation with the USFWS.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors, USFWS	1. Verify completion of exit hole surveys. 2. Confirm establishment of exclusion zones to protect elderberry shrubs in or adjacent to temporary work areas. 3. Verify that worker education is conducted. 4. Confirm avoidance measures implemented. 5. If needed, confirm acquisition of mitigation bank credits for any permanent impacts and shrubs are transplanted where feasible. Document compliance and retain in project file.	1. Design 2. Pre-construction 3. Pre-construction 4. Construction 5. Pre-construction	1.________ 2.________ 3.________ 4.________ 5.________

BIO-TERR-1: Substantial adverse effect on candidate, sensitive or special status species	**BIO-TERR-1e: Avoid and Minimize on Special-Status Amphibians:** *Conduct Protocol Level Surveys* To guide the implementation of avoidance and minimization measures, protocol level surveys for California tiger salamander, California red-legged frog, and foothill yellow-legged frog shall be conducted by a USFWS and CDFW-approved biologist (approved biologist) that possess necessary handling permits (California tiger salamander only). • California tiger salamander surveys will be conducted in potentially suitable habitat according to the USFWS's and CDFW's Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander (U.S. Fish and Wildlife Service and California Department of Fish and Wildlife 2003). • California red-legged frogs surveys will be conducted in potentially suitable habitat according to the USFWS's Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog (U.S. Fish and Wildlife Service 2005). • Foothill yellow-legged frog surveys will be conducted according to CDFW's Considerations for Conserving the Foothill Yellow-Legged Frog (California Department of Fish and Wildlife 2018b) or the most up to date survey protocol at that time. No specific protocol has been developed for western spadefoot toad but presence will be determined by conducting surveys during the winter and spring to identify adults, egg masses, larvae, and/or metamorphs. *Avoidance and Minimization Measures* The following measures shall be implemented to avoid and minimize effects on special-status amphibians during construction and maintenance activities, if presence is confirmed by protocol level surveys of special-status amphibians as described above. • Ground disturbance will be limited to permanent and temporary impact areas identified in final plans for the reservoir. • The pond that falls within the area identified as needed for access to and construction of two of the saddle dams will be avoided during construction by placing high visibility fencing around the perimeter of the pond. The fencing will be open at the bottom to allow the movement of wildlife in and out of the pond. • The approved biologist will be present during all ground-disturbing activities and during any activities involving heavy equipment in used in or adjacent to suitable upland and/or aquatic habitat. • Maintenance activities in vegetated areas will be conducted during the dry season (generally April 1 to October 14) and will avoid and minimize disturbance to small mammal burrows. Use of first- and second-generation rodenticides shall not be permitted except for the limited use of zinc phosphide, or a rodenticide allowed for use by the California Department of Pesticide Regulation. • Within habitat for California tiger salamander, California red-legged frog, and western spadefoot toad initial ground-disturbing activities will not take place during the rainy season, generally October 15 to March 31 (or until the first measurable rain of 1 inch or greater), to avoid the period when most amphibian movement across upland habitat are expected to occur. • Ground disturbing activities may take place during the wet season in areas where potential habitat for special-status amphibians has been removed and when an approved biologist is present to monitor activities. • When work occurs in special-status amphibian habitat, the approved biologist will conduct a pre-activity survey immediately prior to work beginning. The biologist will inspect beneath equipment, vehicles, and stored materials that had been left in the work area overnight. • If a special-status amphibian is found in a work area it will at first be allowed to move out of the work area on its own but if there is no suitable habitat for the animal to freely move to it will be relocated by the approved biologist to a pre-determined location identified in coordination with USFWS and CDFW. • To prevent the accidental entrapment of species during construction, all excavated trenches and holes deeper than 6 inches will be ramped at the end of the workday to allow trapped animals a means of escaping. Earthen ramps will be constructed at each end of the active trench and boards will be placed in open holes. Each day that a trench and/or hold is open and prior to backfilling, these areas will be inspected by a USFWS and CDFW approved monitor. If an animal is found trapped in a trench or hole, construction will cease until it exits the trench or hole on its own or is relocated to an approved location by a USFWS and CDFW-approved biologist. • If work in suitable special-status amphibian habitat occurs during the rainy season, generally October 15 to March 31, and lasts for more than 1 day, exclusion fencing will be installed between the work area and areas of suitable	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors, CDFW, USFWS	1. Verify completion of protocol-level surveys. 2. If species are present, confirm that avoidance and minimization measures are included in project specifications and in operation and maintenance manuals for project. 3. If species are present, confirm completion of pre-construction surveys. 4. Verify monitoring during construction, if needed, and document implementation of all protection measures during construction. Document compliance and retain in project file.	1. Design 2. Design 3. Pre-Construction 4. Construction	1.________ 2.________ 3.________ 4.________

Impact Statement	Mitigation Measure (Exact Text)	Party Responsible for Implementation and Reporting	Review and Approval by:	Monitoring and Reporting Actions	Implementation Schedule -Design -Pre-construction -Construction -Operation	Verification: Status/ Date Completed/ Initials
	habitat. A USFWS and CDFW approved biologist will determine where exclusion fencing will be installed. The fencing will be installed to a depth of 6 inches and be at least 36 inches above grade. The contractor will avoid placing fencing on top of ground squirrel burrows. A qualified biologist will inspect the fencing daily for the presence of these species. • If the exclusion fence is found to be compromised at any time, a survey will be conducted immediately preceding construction activity that occurs in special-status amphibian habitat or in advance of any activity that may result in take of the species. The biologist will search along exclusion fences and in pipes and beneath vehicles before they are moved. The survey will include a careful inspection of all potential hiding spots, such as along exclusion fencing, large downed woody debris, the perimeter of ponds, wetlands, and riparian areas. Any special-status amphibians found will either be allowed to move on its own accord or will be captured and relocated as described above. • Between when construction begins and when the reservoir is filled, when construction activities occur in streams, temporary aquatic barriers such as hardware cloth will be installed both up and downstream of the in-stream work area, and special-status amphibians will be relocated and excluded from the work area. The approved biologist will establish an adequate buffer on both sides of creeks and around potential aquatic habitat and will restrict entry during the construction period. • If the use of pumps is necessary for diverting flows or dewatering Del Puerto Creek during construction of the dam, pump intakes will be fitted with a screen-type device consisting of, at minimum, a water intake strainer. Water intake strainers are most appropriate for low-volume diversion projects. For high-volume water diversion projects or other diversion activities that may warrant greater protection, pump intakes shall be fitted with screens made of woven mesh, perforated plate, or wedge wire. The screen medium must be able to withstand forces related to pumping and be of sufficient size to prevent amphibian larvae from entering the intake and being diverted within the water.					
BIO-TERR-1: Substantial adverse effect on candidate, sensitive or special status species	**BIO-TERR-1f: Compensation for the loss of California Tiger Salamander Habitat** If protocol level surveys determine that California tiger salamander is not present in the study area, then no further mitigation is required. If California tiger salamander is present in aquatic and upland habitat in the study area, the habitat permanently lost due to the proposed project shall be mitigated at a minimum of 1:1. Mitigation shall be achieved through either purchasing credits a USFWS and CDFW approved mitigation bank or through the purchase of a conservation easement with an associated endowment approved by USFWS and CDFW. Any conservation lands will be shown to be occupied by California tiger salamander and will be managed in perpetuity for the benefit of the species. Details of the mitigation shall be further developed in consultation with USFWS and CDFW.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors, CDFW, USFWS	1. Confirm acquisition of compensation habitat for any permanent impacts. Document compliance and retain in project file.	1. Pre-construction	1.________
BIO-TERR-1: Substantial adverse effect on candidate, sensitive or special status species	**BIO-TERR-1g: Compensate for the Loss of California Red-legged Frog Habitat** If protocol level surveys determine that California red-legged frog is not present, no compensatory mitigation would be required. If California red-legged frog is present in aquatic and upland habitat in the study area, the habitat permanently impacted due to the proposed project shall be mitigated at a minimum of 1:1. Mitigation shall be achieved through either purchasing credits at a USFWS approved mitigation bank or through the purchase of a conservation easement with an associated endowment approved by USFWS. Any conservation lands will be shown to be occupied by California red-legged frog and will be managed in perpetuity for the benefit of the species. Details of the mitigation shall be further developed in consultation with USFWS.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors, CDFW, USFWS	1. Confirm acquisition of compensation habitat for any permanent impacts. Document compliance and retain in project file.	1. Pre-construction	1.________
BIO-TERR-1: Substantial adverse effect on candidate, sensitive or special status species	**BIO-TERR-1h: Compensate for the Loss of Foothill Yellow-legged Frog Habitat** If surveys determine that foothill yellow-legged frog is not present in Del Puerto Creek no further mitigation is necessary. If foothill yellow-legged from is present, the habitat permanently impacted due to the proposed project shall be fully mitigated by either purchasing property and/or a conservation easement that contains stream habitat of similar quality and quantity and that is currently occupied by foothill yellow-legged frog and/or represents an area that has been historically occupied and where successful recolonization is likely (e.g., known occupation in nearby watershed or tributary). A final mitigation plan shall be developed and approved by CDFW. The plan shall include measures for the long-term management of these lands for the benefit of foothill yellow-legged frog and include adaptive management measures.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors, CDFW	1. Confirm acquisition of compensation habitat for any permanent impacts. Document compliance and retain in project file.	1. Pre-construction	1.________

Impact Statement	Mitigation Measure (Exact Text)	Party Responsible for Implementation and Reporting	Review and Approval by:	Monitoring and Reporting Actions	Implementation Schedule -Design -Pre-construction -Construction -Operation	Verification: Status/ Date Completed/ Initials
BIO-TERR-1: Substantial adverse effect on candidate, sensitive or special status species	**BIO-TERR-1i: Avoid and Minimize Impacts on Special-Status Reptiles** The following measures shall be implemented to ensure that the proposed project does not have a significant impact on special-status reptiles. • The approved biologist monitoring construction will survey for special-status reptiles in areas of suitable habitat (i.e., permanent removal of 138 acres and temporary disturbance of 530 acres of grassland and scrub) immediately prior to initial ground disturbing activities and vegetation removal. If special-status reptiles are not found, no additional measures are required. • If any special-status reptiles are found, work will not begin until they are allowed to passively move out of the work area or are relocated to a CDFW-approved relocation site. Relocation of these species would require consulting with CDFW and a letter from CDFW authorizing this activity o No monofilament plastic will be used for erosion control. o The approved biologist will inspect open trenches and pits and under construction equipment and materials left on site for special-status reptiles each morning before equipment and materials are moved. o Ground disturbance in suitable habitat will be minimized to the extent practicable. o Vegetation outside the work area will not be removed. o All vegetation removal will be monitored by the approved biologist to minimize impacts on special-status reptiles.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors, CDFW	1. Verify completion of surveys. 2. Confirm passive relocation has occurred or individuals relocated. 3. Verify establishment of exclusion zones as needed. 4. Confirm inspection and monitoring by biologist if species are determined to be present. Document compliance and retain in project file.	1. Pre-construction 2. Pre-Construction 3. Pre-Construction 4. Construction	1.________ 2.________ 3.________ 4.________

BIO-TERR-1: Substantial adverse effect on candidate, sensitive or special status species	**BIO-TERR-1j: Avoid and Minimize Impacts on Western Burrowing Owl** The following measures, which were developed based on the *Staff Report on Burrowing Owl Mitigation* (California Department of Fish and Game 2012), shall be implemented to avoid and minimize potential adverse impacts on burrowing owls prior to and during project construction and maintenance activities that require large areas of ground disturbance (e.g., grading). • A qualified biologist will conduct preconstruction take avoidance surveys for burrowing owl 14 days prior to and a second survey within 24 hours of initiating ground-disturbing activities and before the filling of the reservoir. The survey area will encompass the work area and a 500-foot buffer around this area, as well as the inundation area. If no burrowing owls are found, then no further mitigation would be required unless there is a lapse in time before the start of construction activities. • To the maximum extent feasible, construction activities within 500 feet of active burrowing owl burrows will be avoided during the nesting season (February 1–August 31). • If an active burrow is identified near a proposed work area and work cannot be conducted outside the nesting season (February 1–August 31), a no-activity zone will be established by a biologist experienced with burrowing owls in coordination with CDFW. The no-activity zone will be large enough to avoid nest abandonment and will extend a minimum of 250 feet around the burrow. • If burrowing owls are present at the site during the nonbreeding season (September 1–January 31), a qualified biologist will establish a no-activity zone that extends a minimum of 150 feet around the burrow. • If the designated no-activity zone for either breeding or non-breeding burrowing owls cannot be established, a wildlife biologist experienced in burrowing owl behavior will evaluate site-specific conditions and, in coordination with CDFW, recommend a smaller buffer (if possible) that still minimizes the potential to disturb the owls. The site-specific buffer will consider the type and extent of the proposed activity occurring near the occupied burrow, the duration and timing of the activity, the sensitivity and habituation of the owls, and the dissimilarity of the proposed activity to background activities. • If burrowing owls are present in the direct disturbance area and cannot be avoided during the non-breeding season (generally September 1–January 31), passive relocation techniques (e.g., installing one-way doors at burrow entrances) may be used. Passive relocation may also be used during the breeding season (February 1–August 30) if a biologist with burrowing owl experience, coordinating with CDFW, determines through site surveillance and/or scoping that the burrow is not occupied by burrowing owl adults, young or eggs. Passive relocation will be accomplished by installing one-way doors (e.g., modified dryer vents or other CDFW approved method), which will be left in place for a minimum of 1 week and monitored daily to ensure that the owls have left the burrow. Excavation of the burrow will be conducted using hand tools. During excavation of the burrow, a section of flexible plastic pipe (at least 3 inches in diameter) will be inserted into the burrow tunnel to maintain an escape route for any animals that may be inside the burrow. • Any owls in occupied burrows within the reservoir footprint shall be relocated using passive relocation techniques. • Avoid destruction of unoccupied burrows outside the work area and place visible markers near burrows to ensure that they are not collapsed. • Conduct ongoing surveillance of the project site for burrowing owls during project activities. If additional owls are observed using burrows within 500 feet of construction, the on-site biological monitor will determine, in coordination with CDFW, if the owl(s) are or would be affected by construction activities and if additional exclusion zones are required. • If burrowing owls are detected during preconstruction surveys, the Project Partners will compensate for the loss of burrowing habitat according to the guidelines in *Staff Report on Burrowing Owl Mitigation* (California Department of Fish and Game 2012). These guidelines do not recommend minimum habitat replacement ratios but do note that the conservation area should be comparable to or better than that of the impact area, of sufficiently large acreage, and should support burrowing mammals. Any such conservation may be combined with conservation areas that are developed for this project for Swainson's hawk and/or San Joaquin kit fox. If burrowing owl conservation is appropriate on these lands, the respective mitigation and monitoring plans developed for these areas will be modified to include measures for the maintenance and enhancement of habitat for burrowing owl.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors, CDFW	1. Confirm requirements for borrowing owl protection are included in specifications. 2. Verify completion of pre-construction surveys. 3. Verify buffers are established if owls are found during surveys. 4. Verify completion of passive relocation, if needed. 5. Monitor construction activities to verify that measures are implemented as needed during construction. 6. Verify completion of habitat enhancement, if needed. 7. Monitor effectiveness of habitat enhancement, if needed. Document compliance and retain in project file.	1. Design 2. Pre-Construction 3. Pre-Construction 4. Pre-Construction 5. Construction 6. Pre-Construction 7. Post-Construction	1.________ 2.________ 3.________ 4.________ 5.________ 6.________ 7.________
BIO-TERR-1: Substantial adverse effect on candidate, sensitive or special status species	**BIO-TERR-1k: Avoid and Minimize Impacts on Nesting Birds** To the maximum extent practicable, the removal of structures and vegetation (trees, shrubs, and ground vegetation) shall take place during the non-breeding season for most migratory birds. This timing is highly preferable because if an active nest is found during preconstruction surveys in a tree (or other vegetation) that would be removed by project construction, the tree (or other vegetation) would not be allowed to be removed until the end of the nesting season or until the nestlings	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors	1. Confirm that requirements for nesting bird protection are included in specifications.	1. Design 2. Pre-Construction 3. Pre-Construction	1.________ 2.________

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	have fledged, which could delay construction. If vegetation cannot be removed during the non-nesting season, or if ground cover re-establishes in areas where vegetation has been removed, the affected area must be surveyed for nesting birds. Should structure and vegetation removal activities occur between February 15 and September 30, a qualified biologist shall conduct preconstruction surveys for active nesting birds. If an active nest is found in the survey area, a no-disturbance buffer area will be established around the nest site to avoid disturbance or destruction of the nest until the end of the breeding season or until after a qualified wildlife biologist determines that the young have fledged and moved out of the project area (this timing varies by species). Buffers shall be developed by the biologist based on the species nesting behavior, their sensitivity to disturbance, the type or work taking place during the nesting season, and considering the surrounding topography and vegetation, which may attenuate noise and block visual disturbances. Buffers will be at a minimum of 50 feet from disturbance for more common ground nesting birds and a minimum of 500 feet for tree nesting raptors. Initial reservoir filling shall begin outside the nesting season.			2. Verify completion of pre-construction surveys if removals occur during nesting season. 3. Verify buffers are established if nesting birds are found. 4. Monitor construction activities to verify measures are implemented as needed during construction. 5. Confirm initial reservoir filling occurs outside nesting season. Document compliance and retain in project file.	4. Construction 5. Post-Construction	3.________ 4.________ 5.________
BIO-TERR-1: Substantial adverse effect on candidate, sensitive or special status species	**BIO-TERR-1l: Avoid and Minimize Impacts on Swainson's Hawk** The Project Partners shall retain a wildlife biologist experienced in surveying for Swainson's hawk to conduct surveys for the species in the spring/summer prior to construction. The surveys shall be conducted within the limits of disturbance and in a buffer area up to 0.25 mile from the limits of disturbance. The size of the buffer area surveyed will be based on the type of habitat present and the line-of-sight from the construction area to surrounding suitable breeding habitat. Surveys shall follow the methods in Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley (Swainson's Hawk Technical Advisory Committee 2000). A minimum of six surveys shall be conducted according to these methods. If a variance of the survey distance or number of surveys is necessary, the Project Partners shall coordinate with CDFW regarding appropriate survey methods based on proposed construction activities. Surveys generally will be conducted from February to July. Survey methods and results will be reported to the Project Partners and CDFW. Removal of trees within the reservoir inundation area shall take place outside the Swainson's hawk nesting season. Active Swainson's hawk nests within 600 feet of the areas of active construction activities shall be monitored by a wildlife biologist with experience in monitoring Swainson's hawk nests. The monitor shall document the location of active nests, coordinate with the Project Partners and CDFW, and record all observations in a daily monitoring log. The monitor shall have the authority to temporarily stop work if activities are disrupting nesting behavior to the point of resulting in potential take (i.e., eggs and young chicks are still in the nest, and adults appear agitated and could potentially abandon the nest). The monitor shall work closely with the contractor, the Project Partners, and CDFW to develop plans for minimizing disturbance, such as modifying or delaying certain construction activities. A minimum non-disturbance buffer of 600 feet (radius) shall be established around all active Swainson's hawk nests. No entry of any kind related to construction will be allowed within this buffer while the nest is active, unless approved by CDFW through issuance of an Incidental Take Permit or through coordination during project construction. The buffer size may be modified based on site-specific conditions, including line-of-sight, topography, type of disturbance, existing ambient noise and disturbance levels, and other relevant factors. Entry into the buffer for construction activities shall be granted when the biological monitor determines that the young have fledged and are capable of independent survival, or that the nest has failed, and the nest site is no longer active. All buffer adjustments shall be approved by CDFW.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors, CDFW	1. Confirm that requirements for Swainson's hawk protection are included in specifications. 2. Verify completion of pre-construction surveys of habitat and trees to be removed. 3. Verify trees in inundation area removed outside nesting season. 4. Verify buffers are established if Swainson's hawks are found during surveys. Document compliance and retain in project file.	1. Design 2. Pre-Construction 3. Pre-Construction 4. Construction	1.________ 2.________ 3.________ 4.________
BIO-TERR-1: Substantial adverse effect on candidate, sensitive or special status species	**BIO-TERR-1m: Compensate for the Loss of Swainson's Hawk Foraging Habitat** The permanent loss of Swainson's hawk foraging habitat will be mitigated according to the guidance in the *Staff Report Regarding Mitigation for Impacts to Swainson's Hawks (Buteo swainsoni) in the Central Valley of California* (California Department of Fish and Game 1994). This guidance includes recommended mitigation ratios based on the proximity to an active nest (used during one or more of the last 5 years preceding the initiation of the activity).	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors, CDFW	1. Confirm acquisition of compensation habitat for any permanent impacts. Document compliance and retain in project file.	1. Pre-construction	1.________

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BIO-TERR-1: Substantial adverse effect on candidate, sensitive or special status species	**BIO-TERR-1n: Avoid and Minimize Impacts on Bats** To avoid and minimize potential impacts on pallid bat, western red bat, and non-special-status bat species from the removal of trees and buildings, the Project Partners shall implement the following actions. *Preconstruction Surveys* Within 2 weeks prior to rock outcrop disturbance, tree removal, and any building demolition (e.g., sheds and other outbuildings), a qualified biologist shall examine rock outcrops to be disturbed, trees to be removed, and buildings planned for demolition for suitable bat roosting habitat. High-quality habitat features (e.g., deep crevices, large tree cavities, basal hollows, loose or peeling bark, larger snags, abandoned buildings) shall be identified, and the area around these features searched for bats and bat sign (e.g., guano, culled insect parts, staining). Riparian woodland and stands of mature broadleaf trees shall be considered potential habitat for solitary foliage-roosting bat species. If suitable roosting habitat and/or bat sign is detected, biologists shall conduct an evening visual emergence survey of the source habitat feature, from a half hour before sunset to 1–2 hours after sunset for a minimum of two nights. Full-spectrum acoustic detectors shall be used during emergence surveys to assist in species identification. Detectors shall be set to record bat calls for the duration of each night. All emergence and monitoring surveys shall be conducted during favorable weather conditions (calm nights with temperatures conducive to bat activity and no precipitation predicted). The biologist shall analyze the bat call data using appropriate software and prepare a report that will be submitted to the Project Partners and CDFW. *Timing of Rock Outcrop Disturbance, Tree Removal, and Building Demolition* Rock outcrops, trees, and buildings planned for removal and demolition shall have exclusion devices installed between September 15 and October 31 to avoid affecting maternal and hibernating bat roosts. The exact timing of removal and demolition shall be determined based on the results of preconstruction surveys of rock outcrops, trees, and buildings (i.e., if it is determined bats are present). *Protective Measures* Protective measures may be necessary if it is determined that bats are using rock outcrops, buildings or trees in the project footprint as roost sites, or if special-status bat species are detected during acoustic monitoring. The following measures shall be implemented when roosts are found within rock outcrops, trees, or buildings planned for removal according to the timing discussed above. Specific measures will be approved by the Project Partners and CDFW prior to excluding bats from occupied roosts. • Exclusion from roosts will take place late in the day or in the evening to reduce the likelihood of evicted bats falling prey to diurnal predators and will take place during weather and temperature conditions conducive to bat activity. • Biologists experienced with bats and bat evictions will carry out or oversee the exclusion tasks and will monitor rock outcrop disturbance, tree removal and building demolition if they are determined to be occupied. • Trees that provide suitable roost habitat will be removed in pieces, rather than felling the entire tree and shall be done late in the day or in the evening to reduce the likelihood of evicted bats falling prey to diurnal predators, and will take place during warm weather conditions conducive to bat activity. • Structural changes may be made to a known roost proposed for removal, to create conditions in the roost that are undesirable to roosting bats and encourage the bats to leave on their own (e.g., open additional portals so that temperature, wind, light and precipitation regime in the roost change). Structural changes to the roost will be authorized by CDFW and will be performed during the appropriate exclusion timing (listed above) to avoid harming bats. • Non-injurious harassment at the roost site, such as ultrasound deterrents or other sensory irritants, may be used to encourage bats to leave on their own. • One-way door devices will be used where appropriate to allow bats to leave the roost but not to return.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors, CDFW	1. Confirm measures to protect bats are included in specifications, including requirements for removal/disturbance of structures, trees and rock outcrops. 2. Verify completion of preconstruction surveys. 3. If surveys detect bats, confirm that appropriate protection measures are implemented. Document compliance and retain in project file.	1. Design 2. Pre-Construction 3. Construction	1.________ 2.________ 3.________

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	• Prior to rock outcrop disturbance, building demolition, and/or tree removal/trimming and after other eviction efforts have been attempted, any confirmed roost site will be gently shaken or repeatedly struck with a heavy implement such as a sledgehammer or an axe. Several minutes shall pass before beginning disturbance, demolition work, and felling trees to allow bats time to arouse and leave the roost. A biological monitor will search downed vegetation for dead and injured bats. The presence of dead or injured bats will be reported to CDFW. Injured bats will be transported to the nearest CDFW-permitted wildlife rehabilitation facility.					

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BIO-TERR-1: Substantial adverse effect on candidate, sensitive or special status species	**BIO-TERR-1o: Avoid and Minimize Impacts on San Joaquin Kit Fox** The following measures have been adapted from the USFWS's *U.S. Fish and Wildlife Service Standard Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance* (Standard Recommendations) (U.S. Fish and Wildlife Service 2011). A qualified biologist shall conduct a preconstruction survey, within the limits of proposed temporary and permanent construction footprints in the habitat identified in Figure 3.4-5, no less than 14 days and no more than 30 days before the beginning of ground disturbance. The biologist shall conduct den searches by systematically walking transects spaced 30 to 100 feet apart through the action area. Transect distance shall be determined on the basis of the height of vegetation such that 100 percent visual coverage of the ground disturbing area is achieved. If dens are found during the survey, the biologist shall map the location of each den as well as record the size and shape of the den entrance; the presence of tracks, scat, and prey remains; and if the den was recently excavated. Dens shall be classified in one of the following four den status categories: • Potential den: Any subterranean hole within the species' range that has entrances of appropriate dimensions for which available evidence is sufficient to conclude that it is being used or has been used by a San Joaquin kit fox (5 to 8 inches in diameter). Potential dens comprise: (1) any suitable subterranean hole; or (2) any den or burrow of another species (e.g., coyote, badger, red fox, or ground squirrel) that otherwise has appropriate characteristics for San Joaquin kit fox use. • Known den: Any existing natural den or artificial structure that is used or has been used at any time in the past by a San Joaquin kit fox. Evidence of use may include historical records; past or current radio telemetry or spotlighting data; San Joaquin kit fox signs such as tracks, scat, and/or prey remains; or other reasonable proof that a given den is being or has been used by a San Joaquin kit fox. • Natal or pupping den: Any den used by San Joaquin kit fox to whelp and/or rear their pups. Natal/pupping dens may be larger with more numerous entrances than dens occupied exclusively by adults. These dens typically have more San Joaquin kit fox tracks, scat, and prey remains in the vicinity of the den, and may have a broader apron of matted dirt and/or vegetation at one or more entrances. A natal den, defined as a den in which San Joaquin kit fox pups are actually whelped but not necessarily reared, is a more restrictive version of the pupping den. In practice, however, it is difficult to distinguish between the two; therefore, for purposes of this definition either term applies. • Atypical den: Any artificial structure that has been or is being occupied by a San Joaquin kit fox. Atypical dens may include pipes, culverts, and diggings beneath concrete slabs and buildings. If no potential dens are present, no further avoidance measures would be required. If potential San Joaquin kit fox dens are present, their disturbance and destruction shall be avoided. Results of the survey shall be submitted to USFWS and CDFW within one week of the completion of the survey and prior to the beginning of ground disturbance and/or construction activities likely to affect San Joaquin kit fox. If dens are located within the project footprint, the following avoidance buffers shall be applied: • Potential den – 50 feet • Atypical den – 50 feet • Known Den – 100 feet • Natal/pupping den – USFWS and CDFW shall be contacted for further guidance If the den is within the construction footprint and/or reservoir inundation area and if avoidance buffers are not possible, then dens may be collapsed following the guidance in the Standard Recommendations. Additional avoidance and minimization measures identified in the Standard Recommendations shall be implemented during construction in suitable kit fox habitat.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors, CDFW, USFWS	1. Confirm that requirements for kit fox protection are included in specifications. 2. Verify completion of preconstruction surveys of kit fox habitat. 3. Verify notification of USFWS and CDFW. 4. Confirm that avoidance buffers are established for dens in temporary disturbance areas and dens are collapsed appropriately if avoidance is not possible. 5. Verify implementation of standard measures during construction. Document compliance and retain in project file.	1. Design 2. Pre-Construction 3. Pre-Construction 4. Pre-Construction 5. Construction	1.________ 2.________ 3.________ 4.________ 5.________

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BIO-TERR-1: Substantial adverse effect on candidate, sensitive or special status species	**BIO-TERR-1p: Compensate for the Loss of San Joaquin Kit Dispersal Habitat** To compensate for the loss of potential kit fox dispersal habitat, the Project Partners shall obtain conservation easements on properties along the I-5/California Aqueduct corridors from Sperry Avenue/Diablo Grande Parkway (at I-5) north to the area around Del Puerto Creek to improve San Joaquin kit fox dispersal habitat in this area. Suitable areas for conservation easements are located to the east of I-5 to the California Aqueduct or to the west of I-5 (in between I-5 and the proposed dam structure). Both areas currently have abandoned orchards with dense understories of herbs and grasses that are unusable for San Joaquin kit fox. Improvements may include but would not be limited to removing old orchards, implementing vegetation management to keep herbs and grasses short, improve conditions for ground squirrel colonization (e.g., remove thatch, discontinue rodent control measures), and provide artificial kit fox dens along this corridor. A final mitigation plan shall be developed with input from USFWS and CDFW during consultation with the agencies. The plan shall include measures for the long-term management of these lands for the benefit of San Joaquin kit fox dispersal and include adaptive management measures.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors, CDFW, USFWS	1. Verify acquisition and improvement of conservation easements for kit fox dispersal. 2. Document consultation with agencies. Document compliance and retain in project file.	1. Design 2. Pre-Construction	1.________ 2.________
BIO-TERR-1: Substantial adverse effect on candidate, sensitive or special status species	**BIO-TERR-1q: Avoid and Minimize Impacts on American Badger** A qualified biologist shall conduct a preconstruction survey, within the limits of proposed temporary and permanent construction footprints, no more than 30 days before the beginning of ground disturbance. The biologist shall conduct den searches by systematically walking transects spaced 30 to 100 feet apart through the action area. Transect distance shall be determined on the basis of the height of vegetation such that 100 percent visual coverage of the ground disturbing area is achieved. If dens are found during the survey, the biologist shall map the location of each den as well as record the size and shape of the den entrance; the presence of tracks, scat, and prey remains; and if the den was recently excavated. If no dens are found no further mitigation is necessary. If potential American badger dens are located within the proposed work area and cannot be avoided during construction, a qualified biologist shall determine if the dens are occupied or were recently occupied using remote cameras, media tracking, or methodology coordinated with CDFW. If unoccupied, the qualified biologist shall request permission from CDFW to temporarily plug the burrow entrance with sandbags to prevent badgers from re-using them during construction, and or if necessary, to collapse these dens by hand. If occupied, the biologist shall consult with CDFW regarding best practices for encouraging the badger(s) to move to alternate dens outside the work areas, including excavation or construction of artificial dens.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors, CDFW	1. Confirm completion of preconstruction surveys. 2. Verify that dens are plugged or collapsed, and badgers relocated, if necessary. Document compliance and retain in project file.	1. Pre-Construction 2. Pre-Construction	1.________ 2.________
BIO-TERR-2: Substantial Adverse Effect on Riparian Habitat or Other Sensitive Natural Community LU-1: Conflict with Any Applicable Land Use Plan, Policy, or Regulation	**BIO-TERR-2: Compensate for Effects on Riparian Habitat or Other Sensitive Natural Community** Riparian habitat shall be created or acquired and permanently protected to compensate for project effects to ensure no net loss of riparian habitat functions and values. Land that could be acquired could include acres upstream of the reservoir or elsewhere that satisfied appropriate compensation ratios. Compensation ratios shall be based on site-specific information and determined through coordination with state and federal agencies (CDFW, USFWS, USACE, SWRCB). The compensation shall be at a minimum 1:1 ratio (1 acre restored or created for every 1 acre filled) and may be a combination of offsite restoration/creation and mitigation credits. A restoration and monitoring plan shall be developed and implemented concurrently with project construction. The plan shall describe how riparian habitat will be created and monitored, including funding mechanisms and appropriate long-term management measures, and agency reporting requirements.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors, CDFW, USFWS, USACE, SWRCB	1. Verify acquisition of compensation plant community and wetland habitat. 2. Document consultation with agencies. 3. Confirm preparation of management and monitoring plan for compensation habitat. Document compliance and retain in project file.	1. Pre-Construction 2. Pre-Construction 3. Construction	1.________ 2.________ 3.________
BIO-TERR-3: Substantial Adverse Effect on State or Federally Protected Wetlands	**BIO-TERR-3: Compensate for Adverse Effects on State or Federally Protected Wetlands** Suitable wetland habitat shall be created or acquired and permanently protected to compensate for project effects to ensure no net loss of wetland habitat functions and values. Compensation ratios shall be based on site-specific information and determined through coordination with state and federal agencies (CDFW, USFWS, USACE, SWRCB). The compensation shall be at a minimum 1:1 ratio (1 acre restored or created for every 1 acre filled) and may be a combination of offsite restoration/creation and mitigation credits. A restoration and monitoring plan shall be developed and implemented. The plan shall describe how wetland habitat will be created and monitored, including funding mechanisms and appropriate long-term management measures, and agency reporting requirements.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors, CDFW, USFWS, USACE, SWRCB	1. Verify acquisition of compensation wetland habitat. 2. Document consultation with agencies. 3. Confirm preparation of management and monitoring plan. Document compliance and retain in project file.	1. Pre-Construction 2. Pre-Construction 3. Construction	1.________ 2.________ 3.________

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BIO-TERR-4: Interference with the Movement of Native Resident or Migratory Wildlife Species or Established Native Resident or Migratory Wildlife Corridors or Use of Native Wildlife Nursery Sites	**BIO-TERR-4a: Implement Wildlife Crossings** Wildlife crossings and directional wildlife fencing will be incorporated into the new roadway. Crossings shall be composed of bridges and oversized culverts where possible. At all cut/fill locations, wildlife crossing will be considered; pre-engineered, prefabricated structures will be considered in lieu of fill. Crossings shall maximize structure height as much as possible to maximize openness and structure function for a wide range of species including larger ungulates and species which prefer large crossing. Larger structures shall be a minimum of 15 feet in height. Wildlife crossings and fencing shall be designed using the most up-to-date road ecology and wildlife crossing manuals and handbooks.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors	1. Confirm that requirements for crossings and fencing are included in plans for new road. 2. Confirm crossings are built as required. Document compliance and retain in project file.	1. Design 2. Post - construction	1.________ 2.________
BIO-TERR-4: Interference with the Movement of Native Resident or Migratory Wildlife Species or Established Native Resident or Migratory Wildlife Corridors or Use of Native Wildlife Nursery Sites	**BIO-TERR-4b: Wildlife Corridor Preservation and Enhancement** Wildlife connectivity and habitat between the proposed project and I-5 shall be conserved to the maximum extent possible in order to preserve a wide swath of habitat between I-5 and the proposed project. The conserved land shall be as wide as possible and shall incorporate habitat heterogeneity in order to facilitate the movement for a broad range of species.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors	1. Confirm that project plans include habitat corridor between project facilities and I-5. 2. Confirm suitable corridor is present. Document compliance and retain in project file.	1. Design 2. Post - construction	1.________ 2.________
BIO-TERR-4: Interference with the Movement of Native Resident or Migratory Wildlife Species or Established Native Resident or Migratory Wildlife Corridors or Use of Native Wildlife Nursery Sites	**BIO-TERR-4c: Roadway Wildlife Crossing Signage** Non-standard wildlife crossing warning signs shall be installed to alert and educate drivers to maintain the speed limit and stay alert for wildlife crossing the roadway. The signs shall engage drivers by providing explicit instructions. Flashing lights may also be used to draw driver attention to the signs.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors	1. Confirm that project plans and specification include required signage. 2. Verify signs installed. Document compliance and retain in project file.	1. Design 2. Post - construction	1.________ 2.________
BIO-TERR-5: Conflict with Local Policies or Ordinances Protecting Biological Resources	**BIO-TERR-5: Develop a Management Plan for the Protection and Enhancement of Oak Woodlands** Per Policy 4, 4.1, of the Stanislaus County General Plan, the Project Partners shall develop and implement a management plan for the protection and enhancement of oak woodlands to offset the loss of oak woodlands from the project. This plan will include measures for the protection, management, and enhancement of oak woodlands on lands that are acquired for the development of the reservoir but that are above the high-water line for the reservoir. A minimum of 1 acre of oak woodland shall be preserved, managed, and monitored for every acre of oak woodland lost as a result of project implementation.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors	1. Verify preparation of management plan. 2. Confirm implementation of plan. Document compliance and retain in project file.	1. Pre-Construction 2. Post-Construction	1.________ 2.________

BIO-FISH-1: Substantial Adverse Effect on Candidate, Sensitive, or Special Status Species	**BIO-FISH-1: Spawning Gravel Monitoring and Mitigation** A spawning gravel mitigation and monitoring plan shall be developed and implemented by the Project Partners to address potential impacts on white sturgeon spawning habitat in the San Joaquin River. The goal of the plan will be to ensure no long-term deficits in the supply of gravel from Del Puerto Creek to the San Joaquin River. The plan shall include pre- and post-project measurements of bedload transport rates, channel morphology, and bed composition in lower Del Puerto Creek, and an implementation plan for augmenting gravel in this reach if monitoring detects a significant reduction in gravel loads to the San Joaquin River. The purpose of pre-project monitoring would be to define baseline bedload transport rates and channel and bed characteristics prior to dam construction and operation. These measurements would serve as a reference point for evaluating changes in the sediment budget of lower Del Puerto Creek following dam construction. Existing modeling results of the sediment transport capacity of Del Puerto Creek near the proposed dam site and near its confluence with the San Joaquin River would be used to establish initial estimates of gravel transport loads associated with the proposed environmental flow releases (≥ 500 cfs) (Woodard & Curran 2019). These estimates would be used in combination with pre- and post-project measurements of sediment transport and channel and bed characteristics to evaluate changes in the supply of gravel to the San Joaquin River. A professional geomorphologist shall develop a detailed geomorphic monitoring and assessment plan that will be included as part of the mitigation and monitoring plan. Key components of the plan will include a statement of the goals and objectives, pre-project surveys to establish sediment transport and channel monitoring stations, and a detailed description of the sampling design and pre- and post-project monitoring and assessment methods. The number and location of monitoring stations shall be sufficient to characterize pre- and post-project trends in gravel inputs, storage, and outputs in lower Del Puerto Creek as well as associated changes in channel form (e.g., cross sections) and size composition of the bed material. The need for post-project gravel augmentation will be based on the detection of significant changes in sediment (gravel) transport loads, channel form, and bed composition in lower Del Puerto Creek. Because the proposed environmental flow releases are expected to maintain the sediment transport capacity of the creek, any major deficits in the supply of gravel to the channel downstream of the dam would be expected to result in reductions in gravel transport loads and potential changes in channel and bed characteristics such as bed incision, bank widening, and bed coarsening. The following criteria are proposed as thresholds to determine substantial sediment deficits and the need for gravel augmentation: • Post-project measurements of gravel transport loads during peak flow releases indicate that loads have been substantially reduced (>10%) relative to pre-project levels. • A comparison of pre- and post-project channel characteristics (bed elevations, channel widths, and slopes) indicates a substantial change (>10%) in channel morphology associated with a sediment deficit. • A comparison of pre- and post-project bed composition measurements indicates a substantial reduction (>10%) in the amount of gravel (2- to 64-mm diameter) available for transport in the active channel of lower Del Puerto Creek. Because the frequency of monitoring will be dictated by the frequency of major flow events and environmental releases, sediment and channel monitoring will be conducted over a sufficient period to encompass at least three major flow events (≥ 500 cfs) during the post-project monitoring period. Repeated measurements of sediment and channel characteristics over a number of years are necessary to detect major shifts in the sediment regime amid the variability in scour and fill dynamics that may occur over shorter time frames. Although it would be ideal to monitor an equal number of pre-project events, this will likely not be possible because of the limited time frame before project implementation. In this case, the modeled or estimated sediment transport capacity of the creek and the characterization of pre-project channel and bed characteristics will serve as the primary reference conditions for the post-project evaluation. The spawning gravel mitigation and monitoring plan shall also include a description of the spawning gravel augmentation program that would be implemented if monitoring detects a significant reduction in the supply of gravel to the San Joaquin River. The plan will include a list of potential gravel sources (borrow or spoil sites[1]), a description of the methods for determining the locations of gravel placement sites, a description of the monitoring methods that will be used to ensure the effectiveness of mitigation, and a description of the implementation schedule, agency coordination requirements, funding commitments, reporting, and regulatory/permitting requirements of the program.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors	1. Confirm preparation of monitoring and assessment plan and completion of pre-project surveys. 2. Verify completion of post-project assessment. 3. If deficits in gravel transport are identified confirm implementation of gravel augmentation plan. Document compliance and retain in project file.	1. Pre-construction 2. Post-Construction 3. Operation	1.________ 2.________ 3.________
Cultural Resources						
CULT-2: Substantial Adverse Change in Significance of an Archaeological Resource	**CULT-1: Treatment Plan for Site P-50-0344** Prior to construction, a Cultural Resources Treatment Plan shall be implemented for site P-50-0344. The treatment plan will establish the procedures and documentation needed to carry out data recovery for the resource. The treatment plan	Del Puerto Water District	Del Puerto Water District	1. Confirm preparation of treatment plan.	1. Pre-Construction	1.________

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	will include field methods required for data recovery excavations, requirements and procedures for recordation, analysis, curation, reporting, and any other documentation or methods used for adequately mitigating the site. Collectively, the treatment plan shall characterize the nature of the assemblage and data potential at the site as well as synthesize and capture data that may be lost caused by the construction and operations impacts of the project.	and Exchange Contractors	and Exchange Contractors	2. Verify completion of data recovery. Document compliance and retain in project file.	2. Pre-construction	2.________
CULT-2: Substantial Adverse Change in Significance of an Archaeological Resource	**CULT-2: Implement measures to protect previously unidentified cultural resources** Construction will stop if potential cultural resources are encountered. If signs of an archaeological site, such as any unusual or large amounts of bone, stone, or shell, lumber, ceramics, cans, bottles, or any other prehistoric (Native American) or historic cultural resources are uncovered during grading or other construction activities, work will be halted within 100 feet of the find and the Del Puerto Water District and Exchange Contractors will be notified. A qualified archaeologist meeting the Secretary of the Interior's Professional Qualification Standards for prehistoric and historic archaeology shall be retained to evaluate the significance of the find and shall have the authority to modify the temporary no-work 100-foot radius as appropriate, using professional judgement. will be consulted for an on-site evaluation. If the site is or appears to be eligible for listing on the CRHR, additional mitigation, further testing for evaluation, and/or data recovery may be necessary. If the qualified archaeologist determines that the find does not represent a cultural resource, then work may resume immediately and no further agency coordination is required. During operations, a qualified archeologist will conduct a pedestrian survey of the reservoir shore (i.e., the primary area where the water level fluctuates) during periodic maintenance periods of the reservoir or facilities (once every 5-years). This pedestrian survey will identify if there are unknown buried archaeological resources that may have been exposed during water level fluctuations. If cultural resources are found, the archaeologist will determine whether the resource is or appears to be eligible for listing on the CRHR and may be significant pursuant to Appendix G of the *CEQA Guidelines* §15064.5 and PRC Section 21083.2. If the resources are determined to be eligible and significant, the archaeologist will recover the resource(s) pursuant to standard data recovery practices prior to the refilling of the reservoir.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors	1. Confirm that specifications include measures requiring appropriate handling of inadvertent discoveries and that construction personnel are briefed on procedures. 2. If signs of an archaeological site are encountered confirm that construction is halted, archaeologist evaluates find, and appropriate measures are taken. 3. Verify that shoreline surveys are conducted once every 5 years. Document compliance and retain in project file.	1. Pre-construction 2. Construction 3. Operation	1.________ 2.________ 3.________ 4.________
CULT-3: Disturbance of Human Remains	**CULT-3: Implement measures if construction activities inadvertently discover or disturb human remains** If human remains are discovered during any stage of construction, including disarticulated or cremated remains, the construction contractor will immediately cease all ground-disturbing activities within 100 feet of the remains and notify the Del Puerto Water District and the Stanislaus County Coroner. In accordance with California Health and Safety Code section 7050.5, no further disturbance will occur until the following steps have been completed: • The Stanislaus County Coroner has made the necessary findings as to the origin and disposition pursuant to Public Resources Code section 5097.98. • If the remains are determined by the County Coroner to be Native American, the Coroner shall notify NAHC within 24 hours. A professional archaeologist with Native American burial experience will conduct a field investigation of the specific site and consult with the most likely descendant, if any, identified by the NAHC. As necessary and appropriate, the professional archaeologist may provide technical assistance to the most likely descendant, including the excavation and removal of the human remains.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors, County Coroner, NAHC	1. Confirm appropriate notifications have occurred if human burials are encountered. 2. Confirm human remains have been accorded appropriate treatment. Document compliance and retain in project file.	1. Construction 2. Construction.	1.________ 2.________
Geology, Soils, and Seismicity						
GEO-1: Substantial adverse effects due to strong seismic ground shaking, seismic-related ground failure, including liquefaction, and landslides Resources	**GEO-1: Perform Design-Level Geotechnical Evaluations for Seismic Hazards** During the design phase for the proposed project, the Project Partners shall prepare a design level Geotechnical Investigation and Report. The Geotechnical Investigation and Report shall further investigate and evaluate subsurface conditions, potential geohazards, and provide further project – specific information for development of excavation and construction plans and procedures. The geotechnical evaluations shall include appropriate site-specific geotechnical investigations including those focused on the geologic units and soils of the project area that could become unstable as a result of the project and shall be based on the site conditions, location, and professional opinion of the geotechnical engineer. Investigations may include subsurface drilling, soil testing, and analysis of site seismic response to determine	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors	1. Confirm geotechnical evaluations have been completed. 2. Verify that plans and specifications incorporate measures identified in the geotechnical study.	1. Design 2. Design.	1.________ 2.________

[1] Existing sites include the spoil site that is currently used for ongoing channel maintenance activities in Del Puerto Creek (California Department of Water Resources 2015).

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GEO-3: Location of the proposed project on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse	appropriate and feasible measures to be incorporated into the project design. A geotechnical interpretive report shall be prepared to detail the findings of the evaluations. The performance standard to be used in the geotechnical evaluations will be minimization of the hazards associated with seismic ground shaking, landslides, and subsidence. If the results of the geotechnical investigations indicate the presence of hazards, appropriate support and protection measures shall be designed and implemented. Potential landslide mitigation measures that could be considered include avoidance of the feature, or reduction of vulnerability to the project through engineering design. Engineered mitigation options may include subdrains, dewatering, and/or systems to prevent surface water infiltration, and/or design of appropriate stabilization approaches to reduce driving forces and/or increase resisting forces, including retaining walls and mechanically stabilized embankments. Monitoring of the hazardous features including performance of any mitigation option will be included as part of the long-term operation and maintenance of the proposed project. Recommendations provided in the Geotechnical Investigation and Report shall be incorporated into the final construction plans and specifications and shall augment the design and construction requirements of the California Department of Water Resources Division of Safety of Dams (DSOD) dam safety guidelines. Design of the project shall comply with all measures required by DSOD.					
GEO-2: Substantial soil erosion or loss of topsoil HYD-1: Violate any Water Quality Standards or Waste Discharge Requirements or Otherwise Substantially Degrade Surface or Ground Water Quality	**GEO-2: Prepare and implement a SWPPP and associated BMPs** Before any ground-disturbing activities begin, the Project Partners shall prepare a Project Specific SWPPP that will be implemented as part of the Construction General Permitting Process. The contractor hired by the Project Partners to implement the SWPPP shall review and certify they will implement the BMPS identified on the SWPPP, including an erosion control plan, and measures to eliminate construction waste measures to ensure that waters of the United States and the state are protected. The SWPPP shall include site design measures to minimize off-site stormwater runoff that might otherwise affect surrounding habitats. The Central Valley Regional Water Quality Control Board will review and monitor the effectiveness of the SWPPP through mandatory reporting by the Project Partners and the construction contractor as required. The SWPPP shall be prepared with the following objectives: • Identify all pollutant sources, including sources of sediment, that may affect the quality of stormwater discharges from construction of the project. • Identify BMPs that effectively reduce or eliminate pollutants in stormwater discharges and authorized non-stormwater discharges from the site during construction to the Best Available Technology/Best Control Technology standard. • Provide calculations and design details as well as BMP controls for site run-on that are complete and correct. • Identify project discharge points and receiving waters. • Provide stabilization BMPs to reduce or eliminate pollutants following construction. The construction contractor shall implement the SWPPP, including all BMPs, and shall inspect all BMPs during construction. Potential SWPPP BMPs could include but would not be limited to the following: • Preserve existing vegetation where possible. • Roughen the surfaces of final grades to prevent erosion, decrease runoff, increase infiltration, and aid in vegetation establishment. • Place riparian buffers or filter strips along the perimeter of the disturbed area to intercept pollutants before off-site discharge. \ • Place fiber rolls around on-site drain inlets to prevent sediment and construction related debris from entering inlets. • Place fiber rolls along down-gradient disturbed areas of the site to reduce runoff flow velocities and prevent sediment from leaving the site. • Place silt fences down-gradient of disturbed areas to slow down runoff and retain sediment. • Stabilize the construction entrance to reduce the tracking of mud and dirt onto public roads by construction vehicles.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors	1. Verify preparation of SWPPP. 2. Confirm implementation of BMPs. Document compliance and retain in project file.	1. Pre-Construction 2. Construction	1.________ 2.________

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	• Stage excavated and stored construction materials and soil stockpiles in stable areas and cover or stabilize materials to prevent erosion. • Stabilize temporary construction entrances to limit transport/introduction of invasive species and control fugitive dust emissions.					
GEO-4: Location of the proposed project on expansive soil creating substantial direct or indirect risk to life or property	**GEO-3: Site-specific geotechnical investigation for soil expansion** The design-level geotechnical evaluation shall consider the potential for expansive soils and include measures that would ensure that structures are not damaged by expanding and contracting soils. Feasible measures would include removal and replacement of soil, deep foundations, or deep mixing of compressible or expansive soils with stabilizing agents. All measures included in the geotechnical evaluation shall be incorporated into project design specifications.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors	1. Confirm geotechnical evaluations have been completed. 2. Verify that plans and specifications incorporate measures identified in the geotechnical study.	1. Design 2. Design.	1.________ 2.________
GEO-5: Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature	**GEO-4: Preparation and implementation of a Paleontological Resources monitoring and protection plan** A Paleontological Resources, Monitoring, and Protection Plan (Paleontological Plan) shall be prepared for the proposed project by a paleontologist or similar professional. The Paleontological Plan shall include BMPs to be followed by the contractor during construction of the proposed project. The Paleontological Plan may include, but is not limited to: • Processes and requirements for the observation of grading and earth disturbing activities to watch for fossils or other paleontological resources including identification of those construction activities/components of the proposed project that might require monitoring. • A process to follow if paleontological resources are discovered, including: o Stop all work and salvage unearthed fossil remains including simple excavation of exposed specimens or, if necessary, plaster-jacketing of large and/or fragile specimens, or richly fossiliferous deposits o Record stratigraphic and geologic data to provide a context for the recovered fossil remains, typically including a detailed description of all paleontological localities within the project site, as well as the lithology of fossil-bearing strata within the measured stratigraphic section, if feasible, and photographic documentation of the geologic setting o Prepare collected fossil remains for curation, to include cleaning the fossils by removing the enclosing rock material, stabilizing fragile specimens using glues and other hardeners, if necessary, and repairing broken specimens; o Curate, catalog and identify the fossil remains to the lowest taxon possible, inventory specimens, assign catalog numbers, and enter the appropriate specimen and locality data into a collection database; and o Transfer the cataloged fossil remains to an accredited institution (museum or university) in California that maintains paleontological collections for archival storage and/or display. The transfer shall include copies of relevant field notes, maps, stratigraphic sections, and photographs. o Prepare a Paleontological Resources Mitigation Report summarizing the field and laboratory methods used, the stratigraphic units inspected, the types of fossils recovered, and the significance of the fossils collected, and provide this report to the Project Partners, Stanislaus County, and appropriate paleontological programs/institutions near the proposed project site such as the University of California (Berkeley) Museum of Paleontology or the Natural History Museum of Los Angeles County. The Paleontological Plan shall be reviewed and implemented by the Project Partners and the contractor.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors	1. Confirm preparation of paleontological plan. 2. Confirm that plans and specifications incorporate measures identified in the Paleontological Plan. 3. If resources are encountered verify appropriate treatment and curation of fossil remains. Document compliance and retain in project file.	1. Pre-Construction 2. Pre-Construction 3. Construction	1.________ 2.________ 3.________

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Greenhouse Gas Emissions						
GHG-1: Generate greenhouse gas emissions that may have a significant impact on the environment GHG-2: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases	**GHG-1: Best Performance Standards** The Project Partners shall implement all feasible Best Performance Standards. The SJVAPCD defines Best Performance Standards as "the most effective in-practice means of reducing or limiting GHG emissions from a GHG emissions source." Types of Best Performance Standards that the proposed project shall implement during construction could include but would not be limited to: • Use equipment types that rely on electric and/ or hybrid fuel, which has the potential to reduce GHG emissions up to 22% (CAPCOA 2010). Note that biodiesel fuel use, while beneficial for reducing particulate matter emissions, does not have a substantial effect, and may actually increase, NO_X and CO_2e emissions. • Limit the size of the construction vehicle fleet, especially vehicles with high Hp (e.g., helicopters), as much as possible. • Limit the amount of time that construction vehicles are operating. • Maintain construction equipment in the best possible working order to maximize engine fuel efficiency • All equipment shall be operated by a properly trained worker to minimize unnecessary vehicle use. • Encourage workers to carpool to and from the site. • Phase vendor and hauling trips. • Where cost effective, mitigate the project's GHG emissions through the one-time purchase of accredited carbon offsets (current price is approximately \$0.50/$MTCO_2e$ for international offsets, \$3.50/$MTCO_2e$ for offsets within the United States, and \$8.50/$MTCO_2e$ for in-state offsets) Types of Best Performance Standards that the proposed project shall implement during long-term operations include: • Implement the most energy efficient equipment design possible • Rely on alternative sources of energy, such as solar, hydro or wind power • Encourage operations and maintenance employees to carpool or otherwise commute using a method other than a single-occupancy fossil-fuel powered vehicle.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors	1. Confirm specifications include best performance standards to reduce GHG emissions during construction. 2. Document purchase of carbon offsets, if applicable. 3. Verify implementation of measures during construction. 4.Verify use of energy efficient pumps. 5. Document use of carbon neutral energy sources, if applicable. 6. Document transportation measures, if applicable. Document compliance and retain in project file.	1. Design 2. Pre-Construction 3. Construction 4. Design 5. Operation 6. Operation	1.________ 2.________ 3.________ 4.________ 5.________ 6.________
Hazards and Hazardous Materials						
HAZ-1: Create a Hazard through Reasonably Foreseeable Upset and Accident Conditions to the Public and the Environment Involving Release of Hazardous Materials into the Environment	**HAZ-1a: Hazardous Materials Management and Spill Control Plan** Before construction begins, the Project Partners shall require all construction contractors to develop and implement a Hazardous Materials Management and Spill Control Plan (HMMSCP) that includes project-specific contingency plan for hazardous materials and waste operations, including management of contaminated soil. The HMMSCP shall be reviewed and approved by Project Partners and shall establish policies and procedures consistent with applicable codes and regulations, including but not limited to the California Building and Fire Codes, as well federal OSHA and Cal/OSHA regulations. Any substance defined by the California Accidental Release Program as extremely hazardous would also require preparation of a Risk Management Plan. Elements of the HMMSCP shall include, but not be limited to the following: • A discussion of hazardous materials management, including delineation of hazardous material storage areas, access and egress routes, waterways, emergency assembly areas, and temporary hazardous waste storage areas; • Notification and documentation of procedures; and • Spill control and countermeasures, including employee spill prevention/response training.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors	1. Confirm requirement for HMMSCP is included in specifications. 2. Confirm contractor has prepared plan, and required elements are included. 3. Confirm implementation of plan. Document compliance and retain in project file.	1. Design 2. Pre-construction 3. Construction	1.________ 2.________ 3.________

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HAZ-1: Create a Hazard through Reasonably Foreseeable Upset and Accident Conditions to the Public and the Environment Involving Release of Hazardous Materials into the Environment	**HAZ-1b: Preparation of Hazardous Materials Business Plan** If project operations involve the use, handling or storage of hazardous materials in excess of threshold quantities, prior to operation of the new facilities, Project Partners shall prepare and implement a Hazardous Materials Business Plan (HMBP) for the proposed project. The plan shall be prepared in accordance with the Hazardous Materials Business Plan Program (California Health and Safety Code, Section 25500, et seq., and the related regulations in CCR Title 19 Section 2620, et seq.), and shall be filed with the California Environmental Reporting System. The HMBP shall include a hazardous materials inventory, site plan, an emergency response plan, and requirements for employee training.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors	1. Confirm preparation of HMBP. 2. Verify submittal to California Environmental Reporting System. Document compliance and retain in project file.	1. Prior to start of operations 2. Prior to start of operations	1.________ 2.________
HAZ-1: Create a Hazard through Reasonably Foreseeable Upset and Accident Conditions to the Public and the Environment Involving Release of Hazardous Materials into the Environment	**HAZ-1c: Implement Avoidance and Minimization Measures for Impacts Related to the Abandoned Oil Wells** During the project design phase, Project Partners shall verify exact locations of all wells where project construction would disturb the soil above the well location and shall mark the locations of wells for future reference. Special attention shall be paid to Wells 3 and 6, which are potentially located in the footprint of the reservoir inundation area and roadway realignment, respectively. For any well that is outside the project footprint but within 100 feet of the proposed construction area, Project Partners shall impose a 10-foot, no-build buffer zone around the well. If any wells are within the area that would be affected by construction or operation of the project. Project Partners shall determine if avoidance is feasible, and if the avoidance is not possible, **Mitigation Measure HAZ-1d** shall be implemented**.**	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors	1. Confirm locations of wells identified. 2. Confirm design avoids inundation of wells, if feasible. Document compliance and retain in project file. .	1. Design 2. Design	1.________ 2.________ 3.________
HAZ-1: Create a Hazard through Reasonably Foreseeable Upset and Accident Conditions to the Public and the Environment Involving Release of Hazardous Materials into the Environment	**HAZ-1d: Management of Abandoned Oil Wells** For any wells determined to be within the proposed footprint of project facilities, Project Partners shall work with the Geologic Energy Management Division (CalGEM) to ensure that any abandoned well within the inundation area of the Del Puerto Canyon Reservoir is abandoned to current standards. CalGEM will conduct a lease and site inspection for the well. If the well is determined to be hazardous it shall be re-abandoned to current standards. If any unknown wells are discovered during project construction CalGEM shall be notified immediately. Work on abandoned wells shall be permitted and approved by CalGEM, including any modifications, re-abandonment, or mitigation of leaking fluids or gas. Project Partners shall communicate pertinent information from CalGEM to the appropriate county recorder for inclusion in the title information of the subject real property. Physical access to any abandoned well shall be maintained in the event re-abandonment becomes necessary in the future. Rig access shall be maintained to allow a well servicing rig and associated necessary equipment to reach the well without disturbing the surrounding infrastructure. Requirements for physical access shall be considered during design and shall be coordinated with CalGEM.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors, CalGEM	1. If necessary, verify appropriate abandonment of any wells in inundation area. 2. Confirm access to abandoned wells is incorporated in design. 3. Confirm specifications prescribe actions to be taken for any unknown wells discovered during construction. 4. Verify compliance with CalGEM requirements pertaining to abandoned wells. Document compliance and retain in project file.	1. Design 2. Design 3. Design 4. Construction	1.________ 2.________ 3.________ 4.________

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HAZ-1: Create a Hazard through Reasonably Foreseeable Upset and Accident Conditions to the Public and the Environment Involving Release of Hazardous Materials into the Environment	**HAZ-1e: Soil Sampling and Disposal** Prior to acquiring property or obtaining easements for construction of project facilities, Project Partners shall complete a Phase I Environmental Site Assessment for soil and groundwater contamination and potential hazardous materials in structures. The recommendations set forth in the Phase I assessment shall be implemented to the satisfaction of applicable agencies before construction begins. If Phase I assessments indicate the potential for contamination, a Phase II Environmental Site Assessment shall be completed before construction begins. The Phase II assessment may include building material, soil and/or groundwater sampling and analysis for any anticipated contaminants. If the Phase I assessment identifies potential presence of contamination from agricultural activities, the Phase II Assessment would include evaluation of abandoned orchards to test for the presence of organochlorine pesticides (OCPs) in accordance with DTSC's Interim Guidance for Sampling Agricultural Properties. The Phase II sampling is intended to identify how to dispose of any potentially harmful material from excavations, and to determine if construction workers need specialized personal protective equipment while constructing the pipeline through that area. Contaminated soil will not be reused for backfill following excavation. If soil or groundwater contaminated by potentially hazardous materials is exposed or encountered during construction that was not identified in the Phase I assessment, the appropriate hazardous materials agencies shall be notified. If contaminated soils must be excavated and removed from the site, the removal of contaminated soil would be subject to the measures described under **Mitigation Measure HAZ-1a**.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors, DTSC	1. Confirm completion of Phase I assessment. 2. If necessary, confirm completion of Phase II assessment. 3. Confirm appropriate requirements are included in specification if needed. 4. Confirm appropriate disposal of any contaminated soil present in the project area. Document compliance and retain in project file.	1. Design 2. Design 3. Design 4. Construction	1.________ 2.________ 3.________ 4.________
Hydrology and Water Quality						
HYD-1: Violate any Water Quality Standards or Waste Discharge Requirements or Otherwise Substantially Degrade Surface or Ground Water Quality	**HYD-1a: Comply with General Order for Dewatering or Other Appropriate NPDES Permit** To minimize the impacts to water quality from dewatering activities, the Project Partners shall implement measures contained in the General Order for Dewatering or other appropriate NPDES permit or Waste Discharge Requirement.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors	1. Confirm requirements for permitting of dewatering are included in specifications.. 2. Confirm contractor has obtained authorization for discharge 3. Verify implementation of requirements during construction. Document compliance and retain in project file.	1. Design 2. Pre-construction 3. Construction	1.________ 2.________ 3.________
HYD-1: Violate any Water Quality Standards or Waste Discharge Requirements or Otherwise Substantially Degrade Surface or Ground Water Quality	**HYD-1b: Comply with Reclamation Monitoring Plan for Non-Project Water Pump-in** To minimize impacts to water quality for downstream users of the CVP, the Project Partners shall implement a monitoring plan based on the *Delta Mendota Canal Non-Project Water Pump-in Program Monitoring Plan* (USBR 2018) to ensure compliance with Reclamation water quality standards. The monitoring plan will include sampling and testing of water quality prior to water entering the DMC. Contingency plans shall be implemented if water quality does not meet Reclamation standards.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors, Reclamation	1. Confirm preparation of monitoring plan. 2. Confirm ongoing water quality monitoring. Document compliance and retain in project file.	1. Pre-construction 2. Operation	1.________ 2.________
HYD-2: Substantially Decrease Groundwater Supplies or Interfere Substantially with Groundwater Recharge Such That the Project May Impede Sustainable Groundwater Management of the Basin	**HYD-2: Develop Operation Requirements to Deliver Recharge Water to Lower Del Puerto Creek** The Project Partners shall develop an operations manual that describes water delivery to the lower reach of Del Puerto Creek below the proposed dam to make up for lost natural seepage due to the proposed project. The manual shall provide releases, for the City of Patterson's benefit depending on water year type and Del Puerto Creek inflows, of up to 1,700 AFY. Such releases will augment existing/no-project in-stream recharge conditions.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors, City of Patterson	1. Confirm completion of operations manual. 2. Document implementation of program of releases. Document compliance and retain in project file.	1. Design 2. Operation	1.________ 2.________
Land Use and Recreation						
LU-1: Conflict with Any Applicable Land Use Plan, Policy, or Regulation	**LU-1: Minimize Transmission Structures in Highway Service Commercial Areas** The relocated transmission towers shall be sited to avoid areas zoned for highway service commercial use.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors	1. Confirm location of towers is outside highway commercial area. Document compliance and retain in project file.	1. Design	1.________

Impact Statement	Mitigation Measure (Exact Text)	Party Responsible for Implementation and Reporting	Review and Approval by:	Monitoring and Reporting Actions	Implementation Schedule -Design -Pre-construction -Construction -Operation	Verification: Status/ Date Completed/ Initials
Traffic and Transportation						
TR-1: Conflict with a Plan, Ordinance or Policy Addressing the Circulation System, Including Transit, Roadway, Bicycle and Pedestrian Facilities	**TR-1: I-5 Sperry Avenue Interchange Improvements Project Contributions** The Project Partners shall work with Stanislaus County and the City of Patterson to contribute a fair share toward the planned I-5 Sperry Avenue Interchange Improvements project. The signal at the I-5 Southbound Ramps intersection is required to mitigate the project impact. The signal at the I-5 Northbound Ramps intersection is recommended to provide efficient operations at both intersections, which are closely spaced and which would not function acceptably with signal control at one intersection and side-street stop-control at the other. The proportional share calculation should take into account the existing deficiency at the Southbound Ramps intersection and the non-project traffic volume growth between the existing conditions and near-term conditions without the project, as well as the County and City's plans to secure other state and federal funding for the Interchange Improvements project. Alternatively, the Project Partners may pay a traffic mitigation fee per peak hour trip or another negotiated contribution. Because the planned Interchange Improvements Project is not expected to be fully funded and complete until after the proposed project's construction period, Stanislaus County and the City of Patterson may choose to use the funding contribution, along with other funding sources if available, to erect temporary traffic signals during dam and roadway realignment construction. In addition to contributing funding for a traffic signal at the I-5/Sperry Avenue Interchange, the project partners shall explore development of alternative access to the dam site. It may be possible to direct a portion of the construction traffic along Zacharias Road. Although the public road ends at the DMC, there are bridges across the DMC and California Aqueduct and an undercrossing of Interstate 5, which could provide access to the dam site.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors, Stanislaus County	1. Document financial contribution to interchange project or payment of mitigation fee. 2. If alternate access is determined to be feasible, confirm that access requirements are included in specifications. 3. Verify compliance with the specifications regarding access. Document compliance and retain in project file.	1. Pre-Construction 2. Design 3. Construction	1.________ 2.________ 3.________
TR-3: Substantially Increase Hazards Due to a Geometric Design Feature (e.g., Sharp Curves or Dangerous Intersections) or Incompatible Uses (e.g., Farm Equipment) TR-4: Result in Inadequate Emergency Access	**TR-2: Implementation of Construction Traffic Management Plan** The Project Partners shall prepare a detailed Construction Traffic Management Plan to address traffic conditions throughout the construction period. As part of the plan development, the Project Partners and their construction contractors shall meet with appropriate Stanislaus County, City of Patterson, and Caltrans departments to determine traffic management strategies to reduce, to the maximum extent feasible, traffic congestion and safety effects during construction of the proposed project. The Project Partners shall develop the plans for review and approval by the appropriate City, County and Caltrans departments. The plans shall include at least the following items and requirements: A. A set of comprehensive traffic control measures, including scheduling of major truck trips and deliveries to avoid peak traffic hours, detour signs if required, lane closure procedures, signs, cones for drivers, and designated construction access routes. B. Location of construction staging areas for materials, equipment, and vehicles at approved locations. C. A process for responding to, and tracking, complaints pertaining to construction activity, including identification of an on-site complaint manager. The manager shall determine the cause of the complaints and shall take prompt action to correct the problem. D. Provision for accommodation of pedestrians and bicyclists in the construction area. E. Provision for parking management and spaces on the project site for all construction workers to ensure that construction workers do not park on-street where insufficient shoulder space exists. F. A plan for restoration of pavement to pre-construction conditions after completion of all construction. G. Other items deemed necessary by the City, County and Caltrans during preparation of the Construction Traffic Management Plan.	Del Puerto Water District and Exchange Contractors	Del Puerto Water District and Exchange Contractors, Stanislaus County Department of Public Works, City of Patterson, Caltrans	1. Confirm requirement for Traffic Management Plan is incorporated in specifications. 2. Review and approve Plan and confirm submittal to appropriate City, County and Caltrans departments. 3. Confirm measures are implemented during construction. Document compliance and retain in project file.	1. Design 2. Pre-Construction 3. Construction	1.________ 2.________ 3.________

Agency Abbreviations: CDFW=California Department of Fish and Wildlife, CalGEM=California Geologic Energy Management Division, DTSC=Department of Toxic Substances Control, NAHC=Native American Heritage Commission, SJVAPCD=San Joaquin Valley Air Pollution Control District, SWRCB=State Water Resources Control Board, USFWS=U.S. Fish and Wildlife Services, USACE=U.S. Army Corps of Engineers

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Solving the region's needs through local partnerships