2023 – 2024 Proposed Sites Reservoir Test Pits, Fault Studies and Quarry Studies

Draft Initial Study/Mitigated Negative Declaration

September 2022

Sites Project Authority P.O.
Box 517
Maxwell, California 95955

Mission Statement

The mission of the Sites Project Authority is to provide affordable water sustainably managed for California's farms, cities, and environment for generations to come.

Sites Project Authority
Notice of Intent to Adopt a Mitigated Negative Declaration for the 2023-2024 Sites Reservoir Test Pits, Fault Studies and Quarry Studies

The Sites Project Authority (Authority), as the Lead Agency pursuant to the California Environmental Quality Act (CEQA), has prepared an Initial Study (IS) with Proposed Mitigated Negative Declaration for the 2023-2024 Sites Reservoir Test Pits, Fault Studies and Quarry Studies ("Proposed Project"). The Authority is proposing to conduct field investigations ("investigations") using test pit and trench excavations in Colusa, Glenn, and Yolo Counties. The purpose of these investigations is to obtain information necessary to support the ongoing engineering evaluations and design development for the proposed Sites Reservoir and associated facilities. The Proposed Project includes up to 84 test pits and trenches for 11 fault studies and 7 quarry studies. Test pits would provide information regarding the quantity and quality of borrow materials at proposed quarry locations, as well as information regarding pipeline trench stability; fault studies would provide information in areas of suspected and known fault traces/zones; and quarry studies would provide information on quantity and quality of borrow materials.

Through analysis presented in the Draft IS, the Proposed Project may result in potentially significant environmental impacts to biological resources; cultural resources; paleontological resources; and, tribal cultural resources. However, with implementation of the Proposed Project's standard protocols and procedures and mitigation measures, any potentially significant environmental impacts of the Proposed Project would be reduced to less than significant levels as described in the Draft IS.

The Draft IS is being circulated for public review and comment for a 30-day period starting on **September 23, 2022,** through **October 22, 2022.** Comments on the Draft IS must be received in writing via e-mail or U.S. mail to the contact listed below by 5:00 p.m. on **October 22, 2022**. For e-mailed comments, please include the project title in the subject line.

Alicia Forsythe
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During the 30-day public review period the Draft IS will be available for review on the Authority's Website at: https://sitesproject.org/environmental-review or on the CEQAnet web portal at: https://ceqanet.opr.ca.gov/. Copies of the Draft IS can also be reviewed at the Authority's Office at 122 Old Highway 99 West, Maxwell, CA, 95955. For individuals requesting reasonable accommodations, please contact the Sites Project Authority at 530-438-2309 or Boardclerk@SitesProject.org.

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Proposed Mitigated Negative Declaration
2023 – 2024 Sites Reservoir Test Pits, Fault Studies, and Quarry Studies

Introduction

The Sites Project Authority (Authority) is proposing to conduct field investigations ("investigations" or "Proposed Project") using test pits and trench excavations in Colusa, Glenn, and Yolo Counties. The purpose of these investigations is to obtain information necessary to support the ongoing engineering evaluations and design development for the proposed Sites Reservoir and associated facilities. Specifically, test pits would provide information regarding the quantity and quality of borrow materials at proposed quarry locations, as well as information regarding pipeline trench stability; fault studies would provide information in areas of suspected and known fault traces/zones; and quarry studies would provide information on quantity and quality of borrow materials.

An Initial Study (IS) has been prepared to satisfy requirements of the California Environmental Quality Act (CEQA). The Draft IS is attached to this proposed Mitigated Negative Declaration (MND).

Project Description

The Proposed Project includes conducting investigations by test pits and trench excavations (for the fault and quarry studies) to obtain information necessary to support the ongoing engineering evaluations and design development for the proposed Sites Reservoir and associated facilities.

The proposed Sites Reservoir would include construction and operation of a new offstream storage reservoir with a capacity of approximately 1.3-1.5 million acre-feet and associated water management facilities. The reservoir would be located approximately 10 miles west of the town of Maxwell, in both Colusa and Glenn Counties. Other proposed Sites Reservoir facilities would be located in Colusa, Glenn, Tehama, and Yolo Counties. The investigations would be sited in areas where additional or updated data is needed to inform engineering cost projections, design, and preparation of permit applications for the proposed Sites Reservoir and associated facilities.

The Project Area is shown in Figure 1 of the Draft IS and investigation locations are shown in Figure 2 of the Draft IS. For ease of reference, these figures are attached to this MND (in addition to being included in the Draft IS). The Project Area generally includes the areas in and near the Antelope Valley in Colusa and Glenn Counties where the dams, reservoirs, pipelines, and related facilities could be located for the proposed Sites Reservoir, along with areas near the town of Dunnigan in Yolo County where pipelines and related facilities could be located for the proposed Sites Reservoir.

Three types of investigations are proposed through Colusa, Glenn, and Yolo Counties, as described in the Draft IS. The three investigations are summarized below.

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- Test Pits – Test pits would be used at proposed quarry locations to gather information regarding the quantity and quality of borrow materials proposed for dam and reservoir feature construction fill. In addition, test pits at other locations would provide information regarding pipeline trench stability analysis. Test pit locations were selected to provide sufficient assessment of feature footprints and would allow collection of soil samples for engineering and laboratory analysis. Each test pit would have an approximate footprint of 18 feet by 18 feet. Test pits would be approximately 18 to 20 feet deep, and excavation and sampling would take up to 1 day to complete at each location. Stockpiling of excavated materials would occur adjacent to the hole within the established 50-foot-wide work area. Test pits would be backfilled with the excavated material on the same day as they are excavated with the stockpiled soil and the area restored, as closely as possible, to pre-project or better conditions.
- Fault Studies – Fault trenches would be used to gather information regarding the location and stratigraphy in areas of suspected and known fault traces/zones and to further evaluate the areas for evidence of last movement. Fault trenches have been sited at specific existing and suspected fault line locations in proximity to proposed Sites Reservoir project features. Each trench would be approximately 5 feet wide and range from 200 to 600 feet long, and would vary from 10 to 15 feet deep. Fault studies would occur over a maximum 25-day period at each location. Stockpiling of excavated materials would occur adjacent to the trench within the established 40-foot-wide work area. Trenches would be temporarily covered with heavy duty plywood sheets (3/4 inch or thicker sheets) at the end of each workday. Once the trenching and mapping are complete, the trenches would be backfilled with excavated materials. Upon completion of work at a fault study area, the area would be returned to pre-project or better conditions.
- Quarry Studies – Quarry study trenches would be used to gather information regarding the quantity and quality of borrow materials proposed for dam and reservoir feature construction fill and to assess the means and methods needed to remove overburden and rock materials during construction. These investigations would be conducted by trenching in areas of planned quarries for the Sites Project. Each trench would be up to 20 feet wide and range from 300 to 1,500 feet long, would vary from 15 to 20 feet deep. Stockpiling would occur adjacent to each trench within the established 40-foot-wide work area. Each quarry study trench will take up to 2 days to complete. Open portions of the trenches would be backfilled at the end of each day with excavated materials. Upon completion of work at a quarry study area, the area would be returned to pre-project or better conditions.

Table 1 provides a summary of the investigation types, approximate numbers, and approximate depths by feature (also included as Table 1 in the Draft IS). Figure 2 shows an overview of the proposed investigation locations. All investigations, except for the one test pit in the Dunnigan area, would be in grasslands, open areas of oak savannas, and hayfields located north and east of the town of Sites. The Dunnigan area is generally agricultural, but the test pit would be in an area identified as disturbed habitat and is adjacent to ruderal habitat. No tree removal or trimming is included in the Proposed Project.

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Table 1. Investigation Types, Approximate Numbers, and Approximate Depths by Proposed Sites Reservoir Feature

Proposed Sites Reservoir Feature	Approximate Numbers, Investigation Types, and Approximate Depths
Sites Reservoir	1. Up to 76 test pits, 18 to 20 feet below grade 2. Up to 9 fault studies, 10 to 15 feet below grade 3. Up to 7 quarry studies, 15 to 20 feet below grade
Funks Reservoir	1. Up to 3 test pits, 18 to 20 feet below grade 2. Up to 2 fault studies, 10 to 15 feet below grade
Terminal Regulating Reservoir Pipeline	1. Up to 4 test pits, 18 to 20 feet below grade
Dunnigan Pipeline	1. Up to 1 test pit, 18 to 20 feet below grade
Total	**1. Up to 84 test pits, 18 to 20 feet below grade** **2. Up to 11 fault studies, 10 to 15 feet below grade** **3. Up to 7 quarry studies, 15 to 20 feet below grade**

The investigations are scheduled to occur between January 2023 and December 2024. The sequence would depend on site and seasonal conditions, as well as landowner access. All proposed investigations would be conducted during daylight hours and would be limited to the times allowed by the applicable county noise ordinance.

Using available materials for reference, the Proposed Project planning involved an extensive review of desktop aerial imagery and geographic information system (GIS) data with a goal of selecting investigation locations that would avoid potential sensitive resources to the extent possible. In addition, access to the investigation locations was examined during the desktop evaluation process.

Several standard protocols and procedures have been incorporated as part of the Proposed Project and would be implemented prior to and throughout the investigations. These standard protocols and procedures are listed below and described further in Appendix B of the Draft IS.

- Stormwater Pollution Prevention Plan (SWPPP) and Best Management Practices (BMPs)
- Spill Prevention and Hazardous Materials Management
- Standard Fugitive Dust Control
- Standard Measures to Reduce Equipment Usage and Exhaust
- Traffic Management and Hazards
- Emergency Access
- Health, Safety, Security and Environmental Plan (HSSE Plan)
- Fire Prevention and Suppression at Investigation Locations

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Proposed Impact Determination

As documented in the attached Draft IS, the Authority hereby proposes to find that the Project as mitigated will not have a significant effect on the environment. The Authority will make a final decision regarding whether to adopt an MND and whether to approve the Project by exercising its independent judgment in accordance with the requirements of CEQA upon the conclusion of the public review and comment period for the Draft IS.

The proposed finding by the Authority that the Project would not have a significant effect on the environment is summarized as follows and is explained in greater detail in the attached Draft IS:

The Project would result in no impacts on the following resources: aesthetics, energy, mineral resources, noise, population and housing, public services, recreation, and utilities and service systems.

The Project would have less than significant impacts on agriculture and forestry resources, air quality, geology and soils, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, noise, transportation, and wildfire.

The Project, with implementation of mitigation measures, would result in less than significant impacts to the following resource areas: biological resources, paleontological resources, cultural resources, and tribal cultural resources.

The following mitigation measures will be implemented to avoid, reduce, or minimize potential environmental impacts. Implementation of these mitigation measures would reduce the potential environmental impacts of the Proposed Project to a less-than-significant level. For ease of reference, these mitigation measures are listed below and are described in an attachment to this MND (in addition to being included in the Draft IS).

- Mitigation Measure Gen-1: Conduct Pre-Investigation Siting Survey
- Mitigation Measure Gen-2: Reprioritize or Postpone Proposed Investigations if Sensitive Resources Cannot be Avoided
- Mitigation Measure Bio-1: Conduct Mandatory Biological Resources Awareness Training
- Mitigation Measure Bio-2: General Measures to Avoid and Minimize Effects on Sensitive Biological Resources
- Mitigation Measure Bio- 3: Potentially Regulated Wetlands and Waters of the U.S./State
- Mitigation Measure Bio-4: Valley Elderberry Longhorn Beetle
- Mitigation Measure Bio-5: Vernal Pool Branchiopods
- Mitigation Measure Bio-6: Giant Garter Snake
- Mitigation Measure Bio-7: California Red-legged Frog
- Mitigation Measure Bio-8: Foothill Yellow-legged Frog
- Mitigation Measure Bio-9: Nesting Birds

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- Mitigation Measure Bio-10: Bald and Golden Eagles
- Mitigation Measure Bio-11: Swainson's Hawk
- Mitigation Measure Bio-12: Western Burrowing Owl
- Mitigation Measure Bio-13: Tricolored Blackbird
- Mitigation Measure Bio-14: Bank Swallow
- Mitigation Measure Bio-15: American Badger
- Mitigation Measure Bio-16: Special-status Plant Species and Host Plants for Special-status Pollinators
- Mitigation Measure Bio-17: Special-status Bat Species
- Mitigation Measure Cul-1: Avoid Impacts on Cultural Resources
- Mitigation Measure Cul-2: Pre-activity Pedestrian Survey
- Mitigation Measure Cul-3: Prepare a Post-review Discovery Plan
- Mitigation Measure Cul-4: Conduct Archaeological Sensitivity Training
- Mitigation Measure Cul-5: Conduct Archaeological Monitoring
- Mitigation Measure Cul-6: Immediately Halt Ground-disturbing Activities if Cultural Resources Are Discovered and Implement the Post-review Discovery Plan Prepared under MM Cul-1
- Mitigation Measure Cul-7: Immediately Halt Ground-disturbing Activities if Human Remains Are Discovered and Implement a Burial Treatment Plan
- Mitigation Measure Geo-1: Consult with Qualified Paleontologist if Paleontological Resources Were Discovered
- Mitigation Measure TCR-1: Avoid or Preserve in Place
- Mitigation Measure TCR-2: Treat Resource with Culturally Appropriate Dignity
- Mitigation Measure TCR-3: Permanent Conservation Easements

Attachments:

Figure 1. Proposed Project Vicinity

Figure 2. Investigation Locations

Table 2. Mitigation Measures

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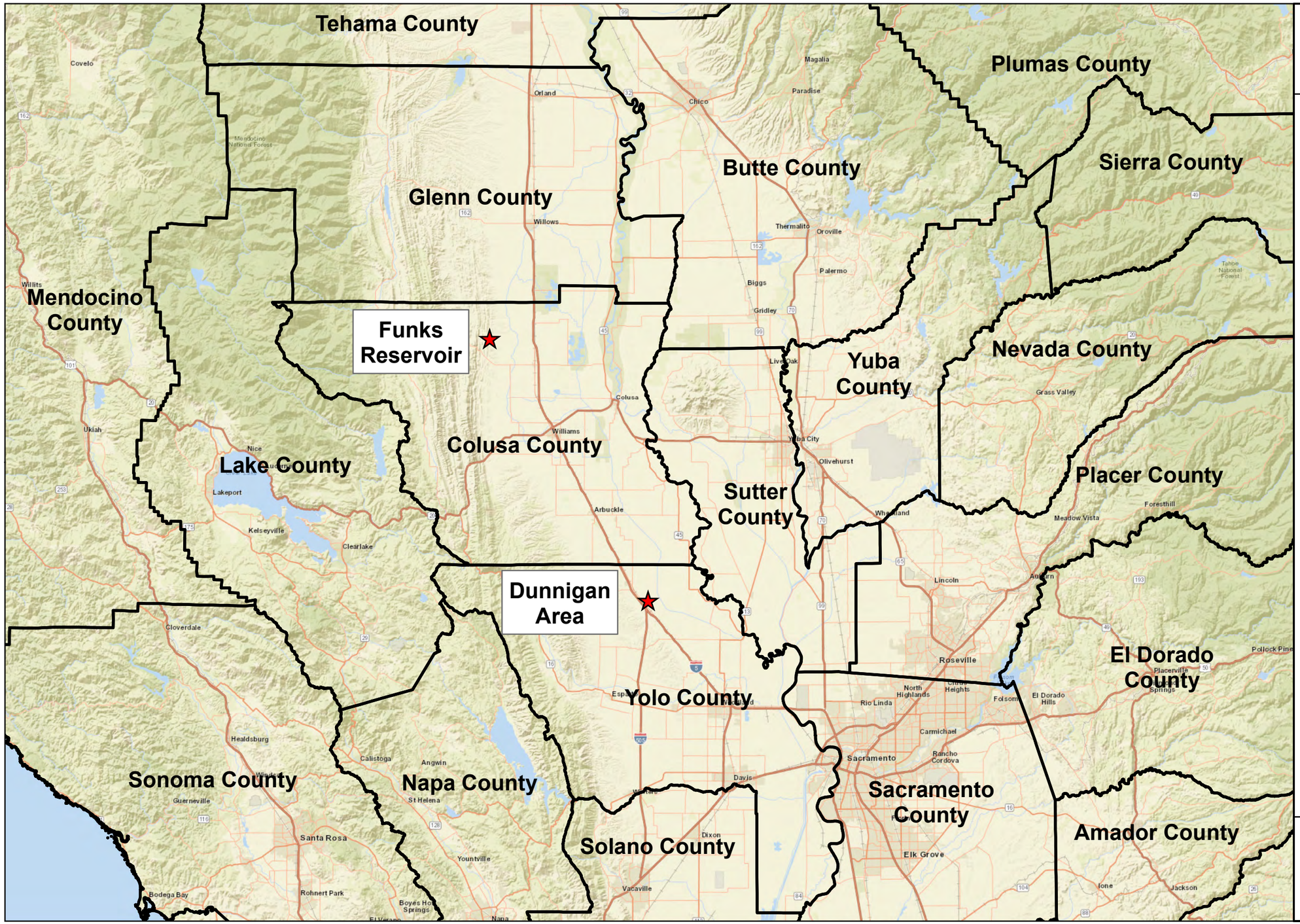
Figure 1
Proposed Project Area



Notes:

Basemap Source: ESRI, 2020
Coordinate System: NAD 1983 CA Zone II
Projection: Lambert Conformal Conic
Datum: North American 1983
Vertical Datum: NAVD88, U.S. Feet

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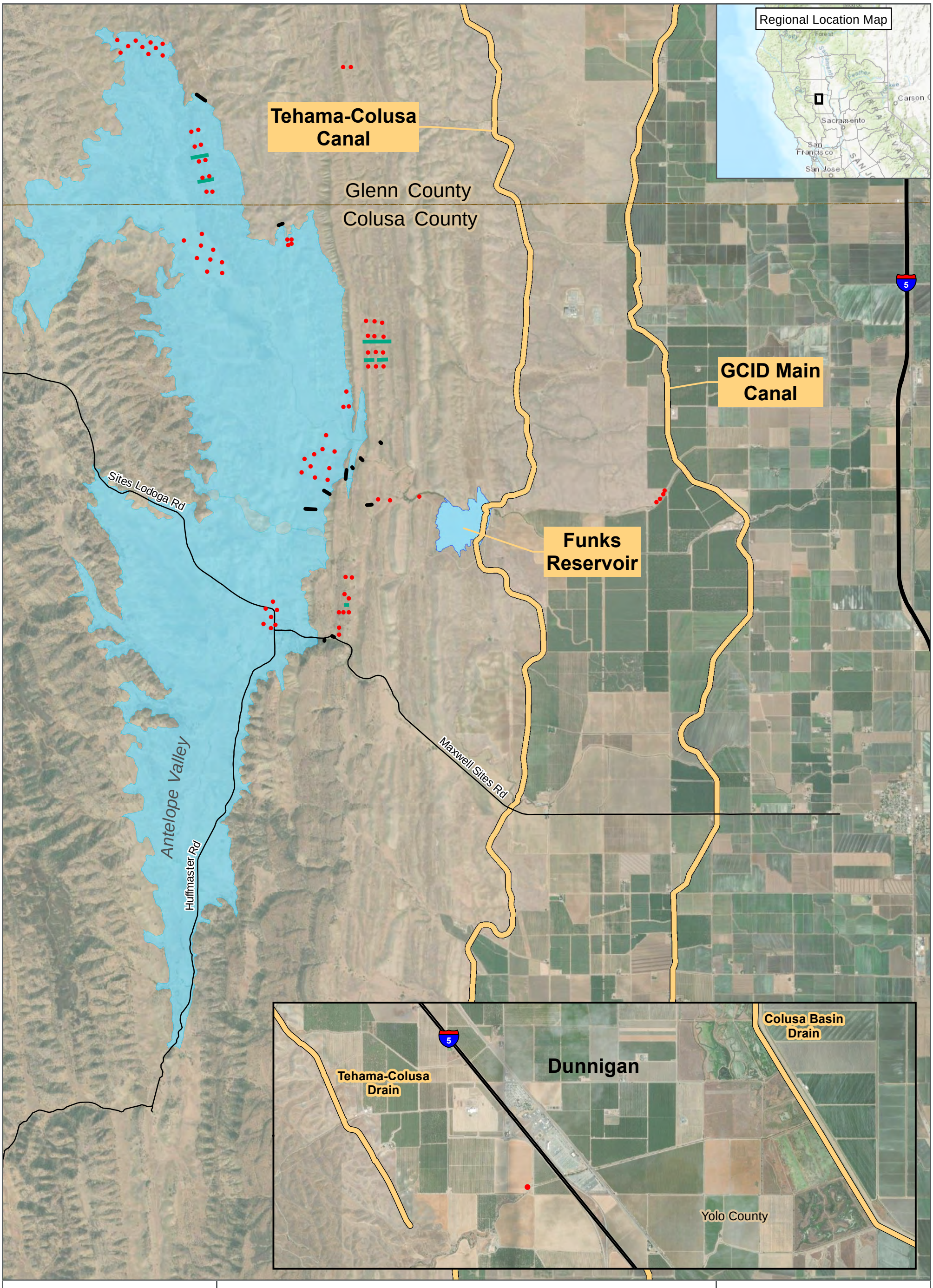

Figure 2, 2023-2024 Sites Reservoir Test Pits, Fault Studies, and Quarry Studies

Base Map Source: ICF, 2021
Imagery Source: ESRI World Imagery 2021
Coordinate System: NAD 1983 CA Zone II
Projection: Lambert Conformal Conic
Datum: North American 1983

DISCLAIMER: This exhibit is preliminary and is subject to change.

MAP DATE: 7/29/2022

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Table 2. Mitigation Measures

Title	Description	Timing	Duration	Responsibility
MM Gen-1: Conduct Pre-Investigation Siting Survey	At least one week prior to mobilization for Proposed Project activities at each investigation location, the Proposed Project contractor and staff, along with a qualified biologist, a cultural resources specialist, and a tribal monitor will conduct a pre-investigation siting survey. Following review of the proposed site locations and investigation plan, the team will conduct a coordinated field survey and provide recommendations to the Proposed Project team to assist in finalizing investigation sites and provide findings as to the extent of the ground surface preparations (if any) that would be needed at each location. The team will also confirm the means of access by personnel and equipment, which includes the biologist, tribal and cultural specialist demarcating the overland access route that avoids impacts to any identified sensitive resources during the siting survey. Adjustments in the exact location of the investigation areas and in the application of species/habitat-specific mitigation measures may be required to avoid or minimize impacts to sensitive resources, to avoid potential utility conflicts, or if specific site conditions are different than anticipated. These adjustments will be limited to the vicinity of the general investigation locations shown in Figure 2 and will remain compliant with any permit restrictions placed on specific areas in the Project Area.	At least one week prior to investigations	One day pre-investigation siting survey for each investigation location	Proposed Project contractor and staff, qualified biologist, cultural resources specialist, and a tribal monitor
MM Gen-2: Reprioritize or Postpone Proposed Investigations if Sensitive Resources Cannot be Avoided	If implementation of MM Gen-1 and cultural or species/habitat-specific mitigation measures do not avoid or minimize permanent impacts to sensitive resources, and resource avoidance would require relocation of the investigation location outside of the area where data collection is needed to inform design, then the need for an investigation at that specific location would be re-evaluated as part of the overall Proposed Project investigation plan and, if found to be necessary, the effort would be reprioritized within the Proposed Project schedule to avoid significant impacts (e.g., moving investigation to later date in schedule to avoid an active bird nest) or postponed to a subsequent investigation effort that would require separate environmental evaluation and permitting.	At least one week prior to investigations	Determination made after one day pre-investigation siting survey for each investigation location	Proposed Project contractor and staff, qualified biologist, cultural resources specialist, and a tribal monitor
MM Bio-1: Conduct Mandatory Biological Resources Awareness Training	Prior to Proposed Project implementation, a qualified biologist will conduct a mandatory biological resources awareness training for all Proposed Project personnel. A qualified biologist is defined as someone with training, knowledge, and experience with the species this document is concerned with. The training will cover special-status species and their habitats that could be encountered in the Project Area. The training will cover the natural history, appearance (using representative photographs), and legal status of species, regulatory protections, penalties for noncompliance, benefits of compliance, as well as the avoidance and minimization measures to be implemented. Participants will be required to sign a form that states they have received and understand the training. The Authority will maintain the record of training and make it available to USFWS and CDFW upon request. The Authority-provided biological monitor will verify that the new personnel brought onto the Proposed Project team receive the mandatory training before starting work.	Prior to investigations	Throughout the investigation period	Proposed Project contractor and staff and qualified biologist

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Title	Description	Timing	Duration	Responsibility
MM Bio-2: General Measures to Avoid and Minimize Effects on Sensitive Biological Resources	General restrictions and guidelines that will be followed by personnel are listed below. The contractor and Authority-provided biological monitor will be responsible for ensuring that crew members adhere to these measures: • Qualified biologists will monitor all terrestrial activities. Any observations of federally listed species will be reported to the Authority and USFWS within 24 hours. Any observations of state listed species will be reported to Authority and CDFW within 24 hours. • Personnel driving vehicles will observe the posted speed limit on paved roads and a 15 mile-per-hour speed limit on unpaved roads, during off-road travel in or adjacent to habitat, and in any areas closed to normal traffic to reduce the risk of vehicle strikes to biological resources during travel in the Project Area. • All project personnel will have stop work authority if a potentially listed species is observed within an active work area. • All food-related trash will be disposed of in closed containers and removed from the work area daily during the work period. Personnel will not feed or otherwise attract fish or wildlife to the work site. • No pets or firearms will be allowed in the Project Area. • All Proposed Project -related equipment will be maintained to prevent leaks of fuels, lubricants, or other fluids. Daily equipment inspections will include inspections for leaks. • Temporary signs, staking, or flagging will be used to identify sensitive biological resources and project personnel will be advised to avoid disturbance of these areas. These areas will be identified during pre-activity surveys. Signs, staking, and flagging will be inspected by the qualified biologist on a daily basis. • Any worker who inadvertently injures or kills a special-status species or finds one dead, injured, or entrapped will immediately report the incident to the Authority-provided biological monitor, who will immediately report the incident to the Authority. The Authority will provide oral notification to the USFWS Sacramento Endangered Species Office within 1 working day. The Authority will follow up with written notification to USFWS within 5 working days. • Vehicles and equipment left onsite overnight will be thoroughly inspected each day for wildlife (both underneath the vehicle and in open cabs) before they are moved. To prevent possible resource damage from hazardous materials such as motor oil or gasoline, personnel will not service or refuel vehicles, equipment, or motorized tools within 300 feet of any aquatic habitat. • Work will be restricted to open areas in riparian habitat and other sensitive natural communities, including woodlands. All work will remain outside of the tree canopy. Additionally, the upper 12 inches of topsoil will be restored at drilled work area within these habitats.	Prior to and during investigations	Throughout the investigation period, including the pre-investigation siting survey	Proposed Project contractor and staff and qualified biologist

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Title	Description	Timing	Duration	Responsibility
MM Bio-3: Potentially Regulated Wetlands and Waters of the U.S./State	The following measures will be implemented to avoid, minimize, and mitigate impacts on wetlands and waters subject to federal and State jurisdiction: • At least 48 hours prior to any ground-disturbing activities, a qualified biologist will ground truth the land cover mapping within proposed investigation areas and staging areas, including areas within 250 feet where accessible (i.e., where access has been granted by the property owner), to confirm the presence and absence of wetlands and waters. All wetlands and waters not previously identified will be mapped in the field using a global positioning system (GPS) with submeter accuracy and will be used to update the land cover mapping. • To the extent practicable, investigations will not take place within 250 feet of wetlands and waters (i.e., ponds, streams, reservoirs) and for activities identified in the Proposed Project description that are near or adjacent to canals and ditches in the agricultural areas. • If work needs to occur within 250 feet of wetlands and waters that are not already restricted by mitigation for special-status wildlife species (see MM Bio-4, 5, and 6), the following measures will be implemented: o Sediment control measures: Prevent transport of sediment from work area; Reduce runoff velocity on exposed slopes; and Reduce offsite sediment tracking. o Management measures for investigation materials: Cover and berm loose stockpiled materials; Store chemicals in watertight containers; and Minimize exposure of work materials to stormwater. o Designate refueling and equipment inspection/maintenance locations at least 300 feet from aquatic habitats. A spill prevention plan will be implemented. o A biological monitor will be onsite during all work within 250 feet of waters and wetlands. o In coordination with the Authority provided biological monitor, disturbed areas will be returned to their original condition, which may include the following: Restoring original topography to the degree possible; Placement of erosion control BMPs (e.g., wattles, soil binders, straw mulch, geotextiles) may be used to help stabilize work areas once work is complete; and Hydroseeding with noninvasive plant seed.	Prior to and during investigations	Throughout the investigation period, including the pre-investigation siting survey	Proposed Project contractor and staff, qualified biologist
MM Bio-4: Valley Elderberry Longhorn Beetle	The following measures will be implemented to avoid, minimize, and mitigate impacts on valley elderberry longhorn beetle throughout the Proposed Project: • Pre-activity surveys for elderberry shrubs will be conducted in and adjacent to potential work areas by a qualified biologist familiar with the appearance of valley elderberry longhorn beetle exit holes in elderberry shrubs. Pre-activity surveys will be conducted in accordance with the USFWS's 2017 *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle* (*Desmocerus californicus dimorphus*). Any elderberry shrubs in the Project Area will be mapped. Those shrubs that are within 300 feet of Proposed Project activities will be identified with flagging and protected with high-visibility fencing (at the edge of the work area) and signs indicating the potential for beetle presence and excluding any Proposed Project activity within 165 feet of the plants. • A qualified biologist will be responsible for ensuring the buffer area fences are maintained throughout implementation of the Proposed Project. • Gravel roadways, staging areas, and other applicable areas will be sprayed with water as needed to minimize dust moving onto elderberry shrubs.	Prior to and during investigations	Throughout the investigation period, including the pre-investigation siting survey	Proposed Project contractor and staff, qualified biologist

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Title	Description	Timing	Duration	Responsibility
MM Bio-5: Vernal Pool Branchiopods	The following measures will be implemented to avoid, minimize, and mitigate impacts on federally listed vernal pool branchiopods: • Prior to any ground-disturbing activities, a qualified biologist will ground truth the land cover mapping within the above identified investigation areas and staging areas, including areas within 250 feet, to confirm the presence or absence of habitat suitable for vernal pool branchiopods. All suitable branchiopod habitat will be mapped in the field using a GPS with submeter accuracy and will be used to update the land cover mapping. Updated maps with exclusion buffers for listed species will be provided to all Proposed Project personnel. • Vehicles and equipment will not travel in identified branchiopod habitat. • Investigations will fully avoid impacts on vernal pool branchiopods and their habitat. Full avoidance requires a minimum 250-foot no-disturbance buffer around all suitable habitat potentially supporting vernal pool branchiopods or drainage features feeding or draining these areas. The buffers will be identified with flagging or high visibility fencing as well as signs identifying it as off limits and protected habitat. • Investigations will not take place within 250 feet of suitable vernal pool branchiopod habitat. • The Authority-provided qualified biologist will ensure that the contractor complies with these avoidance buffers.	Prior to and during investigations	Throughout the investigation period, including the pre-investigation siting survey	Proposed Project contractor and staff, qualified biologist
MM Bio-6: Giant Garter Snake	No work would occur within aquatic habitat for giant garter snake. However, the following measures will be implemented to avoid, minimize, and mitigate impacts on the giant garter snake and its upland habitat should it be identified during ground truthing of the Proposed Project work areas: • Prior to any ground-disturbing activities, a qualified biologist will ground truth the land cover mapping done for the Proposed Project within the above identified investigation areas and staging areas, to confirm the absence of habitat suitable for giant garter snake. In addition, an inspection of all areas within a minimum of 50 feet around the proposed work sites for burrow entrances or other signs of underground refugia will be conducted. As possible, areas near any identified potential refugia within the work area and within the 50-foot buffer will be avoided. All suitable habitat will be mapped in the field using a GPS with submeter accuracy and will be used to update the land cover mapping. Updated maps with exclusion buffers for listed species will be provided to all Proposed Project personnel. • Investigations will not be conducted in giant garter snake upland habitat during the active giant garter snake season (April through October) to the maximum extent practicable. • No less than 30 days prior to Proposed Project implementation, the Authority will submit a request for approval of biologists to conduct monitoring and other activities (see below) associated with the giant garter snake in the areas identified above. • A qualified biologist will survey work areas within 200 feet of giant garter snake aquatic habitat for snakes no more than 24 hours prior to the start of activities. • Movement of heavy equipment will be confined to existing paved and dirt roads and will avoid suitable upland giant garter snake habitat. • A qualified biologist will be present during all investigation activities taking place within 200 feet of suitable aquatic habitat if identified in the Proposed Project. The biologist will visually check for giant garter snake under vehicles and equipment prior to contractors moving them. The biologist will ensure that the contractor caps all materials onsite (e.g., conduits, pipe), precluding wildlife from becoming entrapped. The biologist will check any crevices or cavities in the work area where individuals may be present including stockpiles that have been left for more than 24 hours where cracks/crevices may have formed. • If a giant garter snake is observed by the biologist within the work area, all work will cease until the snake has moved out of the work area on its own, and no capture or relocation will be allowed. The observation will be recorded and reported to the USFWS and CDFW within one business day.	Prior to and during investigations	Throughout the investigation period, including the pre-investigation siting survey	Proposed Project contractor and staff, qualified biologist
MM Bio-7: California Red-legged Frog	No work would occur within suitable California red-legged frog aquatic habitat. If work needs to be conducted within suitable California red-legged frog upland habitat or dispersal habitat (areas within 1 mile of aquatic breeding habitat during the rainy season, generally October 15 to March 31), the following measures will be implemented to avoid, minimize, and mitigate impacts under the guidance of a qualified biologist: • Prior to any ground-disturbing activities, a qualified biologist will ground truth the land cover mapping that was done for the Proposed Project within the above identified investigation areas and staging areas to confirm the presence or absence of habitat suitable for California red-legged frog. All suitable habitat will be mapped in the field using a GPS with submeter accuracy and will be used to update the land cover mapping. Updated maps with exclusion buffers for listed species will be provided to all Proposed Project personnel. • A qualified biologist will be present during all investigation activities in California red-legged frog upland habitat and dispersal habitat (if work occurs during rainy season, generally October 15 to March 31 when frogs are dispersing) to implement avoidance and minimize measures for the	Prior to and during investigations	Throughout the investigation period, including the pre-investigation siting survey	Proposed Project contractor and staff, qualified biologist

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Title	Description	Timing	Duration	Responsibility
	California red-legged frog. The biologist will survey work areas for frogs and for rodent burrows in potential upland habitat before equipment is moved in and work begins. Areas with higher potential for California red-legged frog, such as areas with a high density of burrows, will be flagged for avoidance. The biologist will work with the Proposed Project staff to align work such that burrows are not affected. • The qualified biologist will inspect all equipment left in a work area overnight to ensure that no frogs are present before work begins. Any California red-legged frogs found within a work area will be avoided and allowed to disperse on their own accord. • No work will occur in the aforementioned work areas during or 24 hours following a rain event. Following a rain event, no work will proceed until a qualified biologist has inspected the work areas and verified that there are no California red-legged frogs present. A rain event is to be considered precipitation of at least one-quarter inch within a 24-hour period. • Activities within suitable upland/dispersal habitat will occur during daylight hours (from 30 minutes before sunrise to 30 minutes after sunset). Except when necessary for driver or pedestrian safety during egress, artificial lighting at a worksite will be prohibited during the hours of darkness when working in suitable California red-legged frog upland/dispersal habitat. • If work in suitable California-red legged frog dispersal habitat occurs during the rainy season, generally October 15 to March 31, and lasts for more than 1 day, exclusion fencing will be installed around the work area. Fencing will remain within the Project Area at any location and allow enough room for the movement of equipment and personnel. 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 California-red legged frogs.			
MM Bio-8: Foothill Yellow-legged Frog	All investigations will be sited outside of foothill yellow-legged frog habitat (i.e., intermittent or perennial streams with moderate gradient and rocky substrates). If work occurs within 300 feet of suitable aquatic habitat, a qualified biological monitor will conduct a pre-activity survey immediately prior to work crews entering the work area and will remain onsite for the duration of the activities within 300 feet of suitable aquatic habitat. If a frog is observed in a work area, it will be allowed to move out of the work area on its own. Any observed foothill yellow-legged frogs will be reported to CDFW within 24 hours.	Prior to and during investigations	Throughout the investigation period, including the pre-investigation siting survey	Proposed Project contractor and staff, qualified biologist
MM Bio-9: Nesting Birds	The following measures will be implemented to avoid and minimize impacts on nesting birds, including special-status birds, as well as species not specifically protected by the Migratory Bird Treaty Act, during investigations: • A qualified wildlife biologist with experience with nesting birds will conduct nesting surveys before the start of investigation activities during the breeding season (February 1-August 31). A minimum of two separate surveys will be conducted within 14 days prior to the initiation of work, with the last survey within 24 hours prior to work beginning in a given work area. Surveys will include a search of all suitable nesting habitat in the work area. In addition, where accessible, a 0.25-mile radius around the work area will be surveyed for nesting raptors and a 500-foot radius around the work area will be surveyed for other nesting birds. If no active nests are detected during these surveys, no additional measures are required. • If active nests are found in the survey area, no-disturbance buffers will be established around the nest sites to avoid disturbance or destruction of the nest site until the end of the breeding season (approximately August 31) or until a qualified wildlife biologist determines that the young have fledged and moved out of the Project Area (this date varies by species). A qualified wildlife biologist with appropriate nesting bird experience will monitor activities in the vicinity of the nests to ensure that activities do not affect nest success. The extent of the buffers will be determined by the biologists in consultation with CDFW and will depend on the level of noise or disturbance, line-of-sight between the nest and the disturbance, ambient levels of noise and other disturbances, and other topographical or artificial barriers. Suitable buffer distances may vary between species.	Prior to and during investigations	Throughout the investigation period, including the pre-investigation siting survey	Proposed Project contractor and staff, qualified biologist
MM Bio-10: Bald and Golden Eagles	The following measures will be implemented to avoid, minimize, and mitigate impacts on bald and golden eagles during investigations: • A qualified wildlife biologist with appropriate bald and golden eagle experience will conduct nesting surveys before the start of investigation activities during the breeding season (January 1-August 31). A minimum of two separate surveys will be conducted within 14 days prior to the initiation of work, with the last survey within 24 hours prior to work beginning in a given work area. • Surveys will include a search of all suitable nesting habitat in the work area. In addition, where accessible, a 1-mile radius around the work area will be surveyed for nesting bald and golden eagles. • All investigations (surface and subsurface) will be avoided within 0.5 mile of potential bald eagle nests; and 1 mile of potential golden eagle nests during the nesting season (January 1-August 31).	Prior to and during investigations	Throughout the investigation period, including the pre-investigation siting survey	Proposed Project contractor and staff, qualified biologist

Title	Description	Timing	Duration	Responsibility
MM Bio-11: Swainson's Hawk	The following measures will be implemented to avoid, minimize, and mitigate impacts on Swainson's hawk during investigations: • Pre-activity surveys will be conducted by a biologist with experience with Swainson's hawk to identify the presence of potential Swainson's hawk nest trees on and within 0.25 mile of work and staging areas. Surveys will be consistent with the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (Swainson's Hawk Technical Advisory Committee 2000), or as the methodology is modified based on Proposed Project timing. Survey results will be provided to CDFW by phone or e-mail no less than 5 days prior to commencement of activities, and in a written report within 30 days after commencement of activities. The report will include the location of any known nest trees (occupied within one or more of the last 5 years) present within 0.25 mile of the work footprint. • Investigations will fully avoid Swainson's hawk nests. Investigations will not be conducted within 0.25 mile of an occupied Swainson's hawk nest, except in cases where the Project biologist has determined that case-specific circumstances warrant a smaller buffer. A nest is considered occupied from the time the nest is being constructed until the young leave the nest, or until the nesting attempt fails and the nest is abandoned.	Prior to and during investigations	Throughout the investigation period, including the pre-investigation siting survey	Proposed Project contractor and staff, qualified biologist
MM Bio-12: Western Burrowing Owl	The following measures will be implemented to avoid, minimize, and mitigate impacts on western burrowing owl during investigations. These measures incorporate survey, avoidance, and minimization guidelines adapted from CDFW's *Staff Report on Burrowing Owl Mitigation* (CDFG 2012). • Pre-activity surveys will be conducted with one occurring 14 days prior to all activities, including staging, and another within 24 hours of these activities within and adjacent to areas of suitable habitat. A qualified biologist will survey the Project Area and record and map all burrowing owl observations and burrows that may be occupied (as indicated by tracks, feathers, egg shell fragments, pellets, prey remains, cast pellets, whitewash, or decoration) on the Project Area. The surveys will be conducted while walking transects throughout the proposed investigations areas, plus all accessible areas within a 200-meter (656 foot) radius of the proposed investigation areas. Surveys will be conducted between 10:00 a.m. and 2 hours before sunset. • Burrowing owls will be avoided by relocating work areas. If an active burrow is identified near a work area and work cannot be conducted outside of the nesting season (February 1 to August 31), a qualified biologist will establish a no-activity buffer that extends a minimum of 656 feet around the burrow except in cases where a qualified biologist has determined that case-specific circumstances warrant a smaller buffer. If burrowing owls are present at the site during the nonbreeding season (September 1 through January 31), a qualified biologist will establish a no-activity zone that extends a minimum of 150 feet around the burrow. • If the appropriate no-activity buffer for breeding or nonbreeding burrowing owls cannot be established, a wildlife biologist experienced in burrowing owl behavior will evaluate site-specific conditions and recommend a smaller buffer that still minimizes the potential to disturb the owls (and still allows reproductive success during the breeding season). The site-specific buffer will be established by taking into consideration 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 to existing conditions, and the dissimilarity of the proposed activity to background activities. • A biological monitor will be present during all activities occurring within any reduced buffers. If during the breeding season there is any change in owl nesting and foraging behavior as a result of activities, the biological monitor will work with personnel and Authority to provide additional protections to reduce disturbance, such as adding visual and sound curtains. • If monitoring indicates that the nest is abandoned prior to the end of nesting season and the burrow is no longer in used by owls, the no-activity buffer may be removed.	Prior to and during investigations	Throughout the investigation period, including the pre-investigation siting survey	Proposed Project contractor and staff, qualified biologist
MM Bio-13: Tricolored Blackbird	The following measures will be implemented to avoid, minimize, and mitigate impacts on tricolored blackbird during investigations: • Prior to initiation of investigations within 1,300 feet of suitable nesting habitat, a biologist with experience surveying for and observing tricolored blackbird will conduct pre-activity surveys to establish use of nesting habitat by tricolored blackbird colonies. Surveys will be conducted, where access allows, during the nesting season (generally March 15 to July 31). Three surveys will be conducted within 15 days prior to activities with one of the surveys within 5 days prior to the start of activities. If active tricolored blackbird nesting colonies are identified, the following avoidance measure will be implemented: o Investigations will fully avoid tricolored blackbird nesting and roosting habitat. o To the extent practicable, investigations will not occur within 1,300 feet of an active tricolored blackbird nesting colony (generally March 15 through July 31). Where a buffer distance of 1,300 feet is not practicable, CDFW will be consulted to develop a smaller buffer. The buffer may be reduced in areas with dense trees, buildings, or other habitat features between the activities and the active nest colony, or where	Prior to and during investigations	Throughout the investigation period, including the pre-investigation siting survey	Proposed Project contractor and staff, qualified biologist

Title	Description	Timing	Duration	Responsibility
	there is sufficient topographic relief to protect the colony from excessive noise or visual disturbance as determined by the biological monitor that is experienced with tricolored blackbird. If tricolored blackbirds colonize habitat adjacent to work areas after activities have been initiated, the contractor will reduce disturbance through establishment of buffers and/or sound curtains, as determined by the biological monitor. o Investigations will avoid activities within at least 300 feet from occupied active tricolored blackbird roosting habitat. This minimum buffer may be reduced in areas with dense trees, buildings, or other habitat features between the work activities and the roost, or where there is sufficient topographic relief to protect the roosting site from excessive noise or visual disturbance, or where sound curtains are used, as determined by the biological monitor that is experienced with tricolored blackbird.			
MM Bio-14: Bank Swallow	The following measures will be implemented to avoid, minimize, and mitigate impacts on bank swallow during investigations: • If an active colony is found and work must occur during the nesting season (April 1 through August 31), the Authority will establish a no disturbance buffer (determined by the Authority in consultation with CDFW) around the colony during the breeding season. In addition, a qualified biologist will monitor any active colony within 500 feet of work areas to ensure that activities do not affect nest success.	Prior to and during investigations	Throughout the investigation period, including the pre-investigation siting survey	Proposed Project contractor and staff, qualified biologist
MM Bio-15: American Badger	The following measures will be implemented to avoid, minimize, and mitigate impacts on American badger during investigations: • A qualified biologist will survey for American badger in work areas, concurrent with the pre-activity survey for burrowing owl. If an active den is located, no investigations will occur within 50 feet of an active American badger den. • A biological monitor will be present during all work within 50 to 100 feet of an active American badger den. The monitor will ensure that activities do not affect the den or substantially disrupt the badger's ability to move freely in and out its den.	Prior to and during investigations	Throughout the investigation period, including the pre-investigation siting survey	Proposed Project contractor and staff, qualified biologist
MM Bio-16: Special-status Plant Species and Host Plants for Special-status Pollinators	The following measures will be implemented to avoid, minimize, and mitigate impacts on special-status plant species during investigations: • Pre-activity surveys will be conducted for special-status plant species in all investigation and equipment staging areas, as well as areas within 250 feet of investigation and equipment staging areas. The purpose of these surveys will be to verify that the locations of special-status plants identified in previous record searches or surveys are extant, identify any new special-status plant occurrences, and cover any portions of the Project Area not previously surveyed. During pre-activity surveys, the biologist would also identify any host plants suitable for special-status pollinators (e.g., milkweed, dusty maidens, lupines, medics, phacelias, sages, clarkias, poppies, and wild buckwheats). • All surveys will be conducted by qualified biologists using the using *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (CDFW 2018). To the extent feasible, surveys will be conducted during the blooming season, when special-status plant and pollinator host plant species would be most evident and identifiable. Locations of special-status and pollinator host plants in the Project Area will be recorded using a GPS unit and flagged. • Where surveys determine that a special-status or pollinator host plant species is present in or adjacent to a proposed investigation area, direct and indirect impacts of the Proposed Project on the species will be avoided through the establishment of 250-foot activity exclusion zones surrounding the periphery of occurrences, within which no ground-disturbing activities shall take place. Activity exclusion zones for special-status and pollinator host plant species will be established according to a 250-foot buffer surrounding the periphery of each special-status and host plant species occurrence, the boundaries of which will be clearly marked with standard orange plastic construction exclusion fencing or its equivalent. The establishment of activity exclusion zones will not be required if no activity-related disturbances will occur within 250 feet of the occurrence. The 250-foot buffer may be reduced based on the nature of the activities, the presence of a biological monitor, and/or other site-specific conditions that would allow work to occur closer.	Prior to and during investigations	Throughout the investigation period, including the pre-investigation siting survey	Proposed Project contractor and staff, qualified biologist
MM Bio-17: Special-status Bat Species	The following measures will be implemented to avoid, minimize, and mitigate impacts on special-status bat species during investigations: • Pre-activity surveys will be conducted for special-status bat species in all work areas, including staging areas. The biologist shall look for bats and bat sign, including existing roost sites and bat guano deposits, and will listen for roosting bats. If potential roost sites are identified, a project-specific avoidance and minimization plan shall be prepared by a qualified biologist to be reviewed and approved by CDFW prior to the start of Proposed Project investigations.	Throughout the investigation period	Throughout the investigation period, including the pre-investigation siting survey	Proposed Project contractor and staff, qualified biologist

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Title	Description	Timing	Duration	Responsibility
	• If vegetation trimming is needed, the biologist will examine the trees to be trimmed to identify suitable bat roosting habitat. Trimming of trees with potentially suitable bat roosting habitat will be avoided during the maternity season (generally between April 1 and July 31) and the hibernation season (generally from November 1 to March 1). • If a maternity roost is found, the roost will be protected until July 31 or until the qualified biologist has determined the maternity roost is no longer active. Appropriate no-work buffers around the roost will be established under direction of the qualified biologist. Buffer distances may vary depending on the species and activities being conducted. The establishment of buffers will be coordinated with CDFW through the preparation of the previously referenced project-specific avoidance and minimization plan.			
MM Cul-1: Avoid Impacts on Cultural Resources	Impacts on known historical resources, including prehistoric and historic-era archaeological sites, buildings, structures, and human remains will be avoided to the extent feasible. Methods of avoidance during Proposed Project planning shall include relocation of investigation locations to at least 50 feet away from any identified resource dependent upon the resource and the area, prioritizing the use of existing roadways or other previously disturbed locations for the investigations, rerouting of access routes and the installation of protective fencing around resources where appropriate.	Prior to investigations	Throughout the investigation period, including the 1-day pre-investigation siting survey for each investigation location	Proposed Project contractor and staff, cultural resource specialist, and tribal monitor
MM Cul-2: Pre-activity Pedestrian Survey	Once the investigation sites have been confirmed, built resource surveys and archaeological surveys will be conducted in all work areas to identify whether any new or previously unidentified built historic resources or archaeological sites are present. This activity will be conducted regardless of whether a previous cultural resources survey has covered the area to ensure adequate coverage. All newly identified resources will be recorded on California Department of Parks and Recreation 523-Series forms. If archaeological resources that qualify as historic resources or unique archeological resources under CEQA are identified during pre-activity survey, the Authority will ensure that they are avoided to the extent feasible by implementing the measures in MM Cul-1 (Avoid Impacts on Cultural Resources).	At least one week prior to investigations	One day coupled with the pre-investigation siting survey for each investigation location	Proposed Project contractor and staff, cultural resource specialist, and tribal monitor
MM Cul-3: Prepare a Post-review Discovery Plan	Prior to the start of the Proposed Project investigation activities, a Post-review Discovery Plan (Plan) will be prepared by a qualified archaeologist. Not all cultural resources are visible on the ground surface. Protocols for addressing the accidental discovery of archaeological resources or human remains that are not visible on the ground surface during Proposed Project implementation shall be outlined in the Plan. The Plan shall be developed prior to ground disturbance so that all parties are aware of the actions required if buried archaeological resources are encountered during Proposed Project implementation. At a minimum, the Plan shall include protocols and procedures for addressing post-review discoveries including work stoppage at the discovery site and appropriate assessment of the discovery (see MM Cul-6, below), Archaeological Sensitivity Training for Proposed Project personnel, an Archaeological Monitoring Plan, and a Burial Treatment Plan. The Archaeological Sensitivity Training will cover the historical context, resource types (using representative photographs of soils, features or artifacts if appropriate) and legal status of known resources, regulatory protections, penalties for noncompliance, benefits of compliance, as well as the avoidance and minimization measures that the Proposed Project has implemented. The training will be conducted prior to the start of investigations. The Archaeological Monitoring Plan describes qualifications and protocols for monitoring Proposed Project-related ground disturbance, including the following: • Documentation and chain-of-command notifications. • Procedures for securing an area where cultural remains are discovered. • Procedures for evaluating the nature of the finds. • The schedule for notifications and conducting activities associated with evaluating the finds. • Protocols for establishing minimum depth of test pits and trenches when monitoring is no longer needed. • Specific activities to be monitored include excavation of test pits and trenching and related ground disturbing activities. The Burial Treatment Plan describes specific procedures for burial discovery, including documentation and chain-of-command notifications, and procedures for securing an area where burials are discovered.	Prior to investigations	Throughout the investigation period	Authority's cultural resource specialist

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Title	Description	Timing	Duration	Responsibility
MM Cul-4: Conduct Archaeological Sensitivity Training	The Authority will be responsible for obtaining the services of a qualified archaeologist to conduct archaeological sensitivity training (see MM Cul-3). Prior to the start of the Proposed Project investigations, a qualified archaeologist who meets the Secretary of the Interior's Standards will conduct a mandatory archaeological sensitivity training (see MM Cul-3) for all personnel involved in the investigations about cultural resources sensitivity in the Project Area and cultural resources that could be encountered during the Proposed Project investigations. Participants will be required to sign a form that states they have received and understand the training. The Authority will maintain the record of training and make it available to the Proposed Project's cultural resources staff. The Authority-provided cultural monitor will ensure that the new personnel brought onto the Proposed Project team receive the mandatory training before starting work.	Prior to investigations	Throughout the investigation period	Proposed Project contractor and staff, cultural resource specialist, and tribal monitor
MM Cul-5: Conduct Archaeological Monitoring	The Authority will be responsible for obtaining the services of a qualified archaeologist to conduct archaeological monitoring (see MM Cul-3). One qualified archaeological monitor shall monitor ground-disturbing activities associated with the Proposed Project (i.e., test pits and trenching). Once test pits and trenching activities reach depths exceeding that which is likely to encounter cultural remains as described and established in the Archaeological Monitoring Plan, monitoring is no longer necessary. One Native American monitor (as appropriate according to Proposed Project consultation with tribes) will also be invited to monitor these same Proposed Project ground disturbing activities. In accordance with Cul-6 (Immediately Halt Ground-disturbing Activities if Cultural Resources Are Discovered and Implement a Post-review Discovery Plan), if any important (potentially CRHR-eligible) prehistoric or historic-era features, or any human remains, are exposed during investigations, the archaeological monitor shall have the authority to notify the appropriate contractor supervisor to stop work in the vicinity of the find and implement the Post-review Discovery Plan. If human remains are encountered, the archaeological monitor will also initiate Cul-7 (Immediately Halt Ground-disturbing Activities if Human Remains Are Discovered and Implement a Burial Treatment Plan). Resources identified during investigation activities will be treated in accordance with MM Cul-1 (Avoid Impacts on Cultural Resources).	Throughout the investigation period	Throughout the investigation period	Proposed Project contractor and staff, cultural resource specialist, and tribal monitor
MM Cul-6: Immediately Halt Ground-disturbing Activities if Cultural Resources Are Discovered and Implement the Post-review Discovery Plan Prepared under MM Cul-1	If important (potentially eligible) cultural resources, such as structural features, unusual amounts of bone or shell, flaked or ground stone artifacts, historic-era artifacts, human remains, or architectural remains are encountered during any Proposed Project activities, work shall be suspended in coordination with the appropriate contractor supervisor immediately at the location of the find and within an appropriate radius, with a minimum of 50 feet. The Authority will implement MM Cul-1 (Avoid Impacts on Cultural Resources) and implement the Post-review Discovery Plan prepared under MM Cul-3. As part of the Post-review Discovery Plan, a qualified archaeologist shall conduct a field investigation of the find and recommend avoidance measures deemed necessary for the protection of any cultural resource concluded by the archaeologist to represent an historical resource or unique archaeological resource. If necessary, the qualified archaeologist shall recommend additional measures in consultation with the Authority and responsible agencies and, as appropriate, interested parties such as California Native American tribes. The Authority, in consultation with responsible agencies, will determine when/if ground-disturbing activities at the location may resume. All the activities identified above will be detailed in the Post-review Discovery Plan so that all parties are aware of the actions required if buried archaeological sites are encountered during Proposed Project implementation. Discoveries of human remains shall be treated as described in the following sections for Cul-7 (Immediately Halt Ground-disturbing Activities if Human Remains Are Discovered and Implement a Burial Treatment Plan).	Throughout the investigation period if cultural resources are discovered	Throughout the investigation period	Proposed Project contractor and staff, cultural resource specialist, and tribal monitor

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Title	Description	Timing	Duration	Responsibility
MM Cul-7: Immediately Halt Ground-disturbing Activities if Human Remains Are Discovered and Implement a Burial Treatment Plan	In accordance with relevant provisions of the California Health and Safety Code, if human remains are uncovered during ground-disturbing activities, the potentially damaging excavation must halt in the area of the remains and the local County Coroner must be notified. The coroner is required to examine all discoveries of human remains within 48 hours of receiving notice of a discovery on private or State lands (Health and Safety Code Section 7050.5(b)). If the Coroner determines that the remains are those of a Native American, he or she must contact the California Native American Heritage Commission by phone within 24 hours of making that determination (Health and Safety Code Section 7050(c)). Pursuant to the provisions of Public Resources Code Section 5097.98, the California Native American Heritage Commission will identify a Most Likely Descendant. The Most Likely Descendant designated by the California Native American Heritage Commission will have at least 48 hours to inspect the site and propose treatment and disposition of the remains and any associated grave goods. All the activities identified above shall be detailed in a Burial Treatment Plan (MM Cul-3) developed in consultation with local Native American tribes prior to Proposed Project implementation. If human remains that are not of Native American origin are discovered, disposition of the remains shall be determined in consultation with the coroner or possible descendants if they can be identified.	Throughout the investigation period if human remains are discovered	Throughout the investigation period	Proposed Project contractor and staff, cultural resource specialist, and tribal monitor
MM Geo-1: Consult with Qualified Paleontologist if Paleontological Resources Were Discovered	The proposed investigations have the potential to have impacts on unidentified paleontological resources. If vertebrate or plant fossils are discovered during field activities, the Authority would be notified, and the fossil would be evaluated for its unique properties and protected by extraction, preservation, and curation by a qualified paleontologist.	Throughout the investigation period if paleontological resources are discovered	Throughout the investigation period	Proposed Project contractor and staff, qualified paleontologist
MM TCR-1: Avoid or Preserve in Place	Avoidance and preservation of the resources in place, including, but not limited to, planning and implementing activities to avoid the resources and protect the cultural and natural context, or planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.	Throughout the investigation period	Throughout the investigation period	Proposed Project contractor and staff, cultural resource specialist, and tribal monitor
MM TCR-2: Treat Resource with Culturally Appropriate Dignity	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: • Protecting the cultural character and integrity of the resource. • Protecting the traditional use of the resource. • Protecting the confidentiality of the resource.	Throughout the investigation period	Throughout the investigation period	Proposed Project contractor and staff, cultural resource specialist, and tribal monitor
MM TCR-3: Permanent Conservation Easements	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.	Throughout the investigation period	Throughout the investigation period	Proposed Project contractor and staff, cultural resource specialist, and tribal monitor

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2023 – 2024 Proposed Sites Reservoir Test Pits, Fault Studies and Quarry Studies

Draft Initial Study

September 2022

Sites Project Authority P.O.
Box 517
Maxwell, California 95955

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Appendices

1.0 Environmental Checklist Form

1. Project Title: 2023 – 2024 Proposed Sites Reservoir Test Pits, Fault Studies and Quarry Studies
2. Lead Agency name and address: Sites Project Authority, P.O. Box 517, Maxwell, CA 95955
3. Contact person and phone number: Alicia Forsythe, 530-438-2309
4. Project location: The Proposed Project is located in Colusa, Glenn, and Yolo Counties in Northern California
5. Project sponsor's name and address: Sites Project Authority, P.O. Box 517, Maxwell, CA 95955
6. General Plan designation: Agriculture; State, Federal, and Other Agency Lands; and Commercial General
7. Zoning: Agriculture; State, Federal, and Other Agency Lands; and Highway Service Commercial
8. Description of project: See *Section 2.3 Project Description*
9. Surrounding land uses and setting: Briefly describe the project's surroundings: Most of the project area has historically been or is presently used for agricultural purposes. The project area is primarily rural in character, containing a limited number of rural residences and businesses.
10. Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement.): Colusa County, Glenn County, and Yolo County
11. Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1? 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.? Yes, see Section 20.0 *Tribal Cultural Resources*

1.1 Environmental Factors Potentially Affected

The environmental factors checked below would be potentially affected by this project, including several potentially significant impacts that require mitigation to reduce the impacts to a less-than-significant level. Further detail is provided in the environmental analysis below.

☐	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

2.0 Introduction and Description of Project

The Sites Project Authority (Authority) has prepared this initial study (IS) with a proposed mitigated negative declaration (MND) in compliance with the California Environmental Quality Act (CEQA) for the 2023-2024 Proposed Sites Reservoir Test Pits, Fault Studies and Quarry Studies ("Proposed Project"). The Authority is proposing to conduct field investigations ("investigations") using test pit and trench excavations in Glenn, Colusa, and Yolo Counties. The purpose of these investigations is to obtain information necessary to support the ongoing engineering evaluations and design development for the proposed Sites Reservoir and associated facilities. Specifically, test pits would provide information regarding the quantity and quality of borrow materials at proposed quarry locations, as well as information regarding pipeline trench stability; fault studies would provide information in areas of suspected and known fault traces/zones; and quarry studies would provide information on quantity and quality of borrow materials. Both fault and quarry studies would be conducted using trench excavations, which is further described in the *Subsurface Investigations* section.

2.1 Project Location

The Proposed Project is located in Colusa, Glenn, and Yolo Counties in Northern California. The Proposed Project vicinity is shown in Figure 1 and locations of investigations are shown in Figure 2. The Proposed Project would be implemented generally in and near the Antelope Valley in Colusa and Glenn Counties where the dams, reservoirs, pipelines, and related facilities could be located for the proposed Sites Reservoir, along with areas near the town of Dunnigan in Yolo County where pipelines and related facilities could be located for the proposed Sites Reservoir ("Project Area").

2.2 Project Background

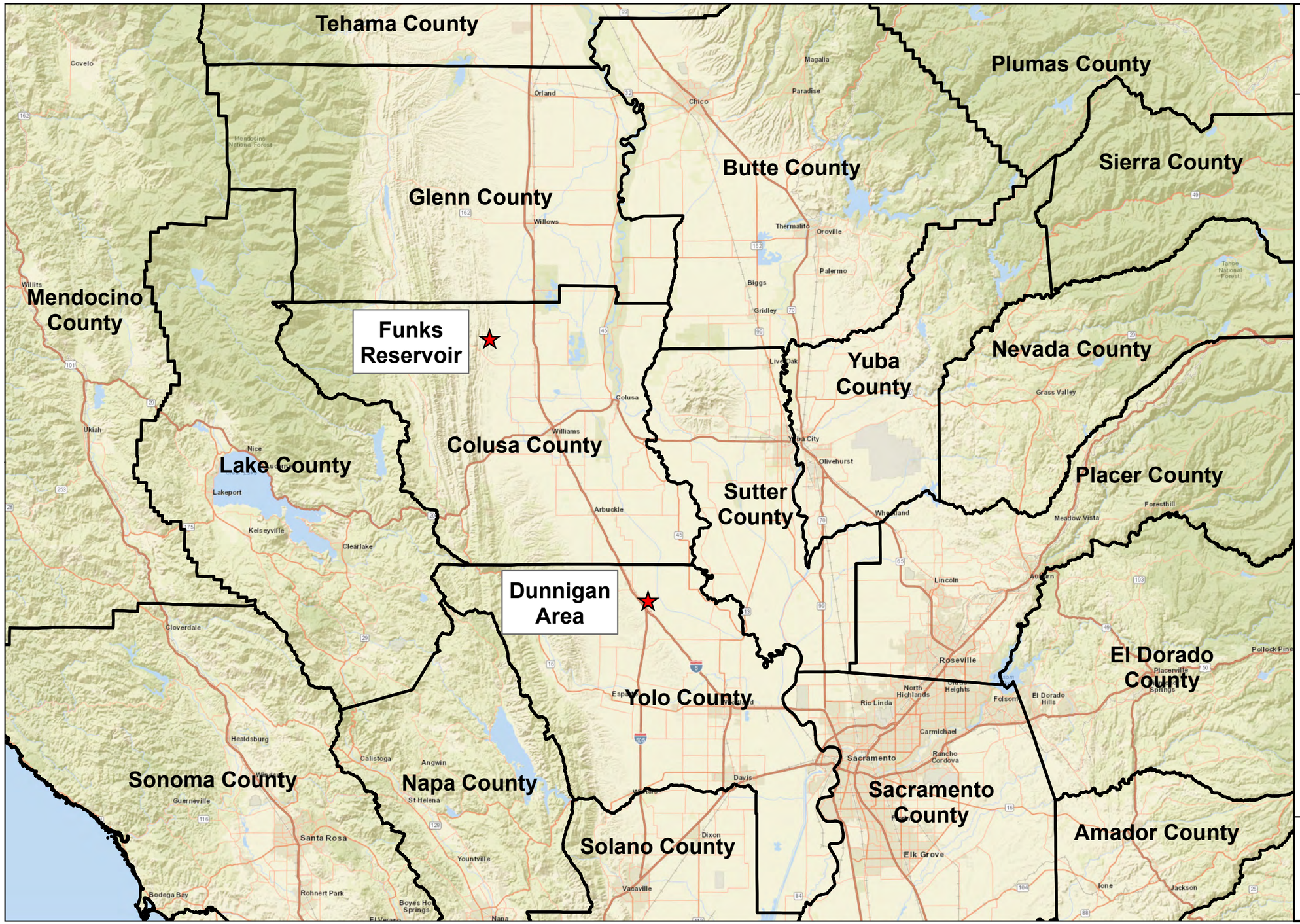
The proposed Sites Reservoir would include construction and operation of a new offstream storage reservoir with a capacity of approximately 1.3-1.5 million acre-feet and associated water management facilities. The reservoir would be located approximately 10 miles west of the town of Maxwell, in both Glenn and Colusa Counties. Other proposed Sites Reservoir facilities would be located in Colusa, Glenn, Tehama, and Yolo Counties.

The proposed Sites Reservoir would use existing infrastructure to divert unappropriated flow from the Sacramento River at Red Bluff and Hamilton City and convey the water to a new offstream reservoir. New and existing facilities would move water into and out of the reservoir, with ultimate release back to the Sacramento River system via existing canals and a new pipeline proposed near Dunnigan, California. The proposed Sites Reservoir would require modifications to the Glenn-Colusa Irrigation District (GCID) system and the Tehama-Colusa (TC) Canal to move water into and out of the reservoir. Water conveyance between the proposed Sites Reservoir and the canals and Dunnigan pipeline would be facilitated by the existing Funks Reservoir and a new Terminal Regulating Reservoir (TRR) and two new associated pumping/generating plants.

Under the Proposed Project, the Authority is proposing to conduct investigations to provide technical information to assist in formulating and refining the engineering design and assist in the preparation of permit applications for the proposed Sites Reservoir. Numerous geotechnical studies have been conducted in the vicinity of the proposed Sites Reservoir since the late 1950s to evaluate the feasibility of Sites Reservoir. Previous investigations generated general stratigraphic data suitable for project feasibility assessments, but insufficient for design. New field and laboratory data needs to be collected specifically in the footprint of each planned facility to: 1) further refine the understanding of geologic

structure and faulting activity, 2) further refine the understanding of the strength and consistency of the soil and rock which will provide the structural support of the new facilities, 3) to evaluate the suitability of local materials for use as construction materials, and 4) provide data to support selection of construction means and methods.

Figure 1
Proposed Project Area



Notes:

Basemap Source: ESRI, 2020
Coordinate System: NAD 1983 CA Zone II
Projection: Lambert Conformal Conic
Datum: North American 1983
Vertical Datum: NAVD88, U.S. Feet

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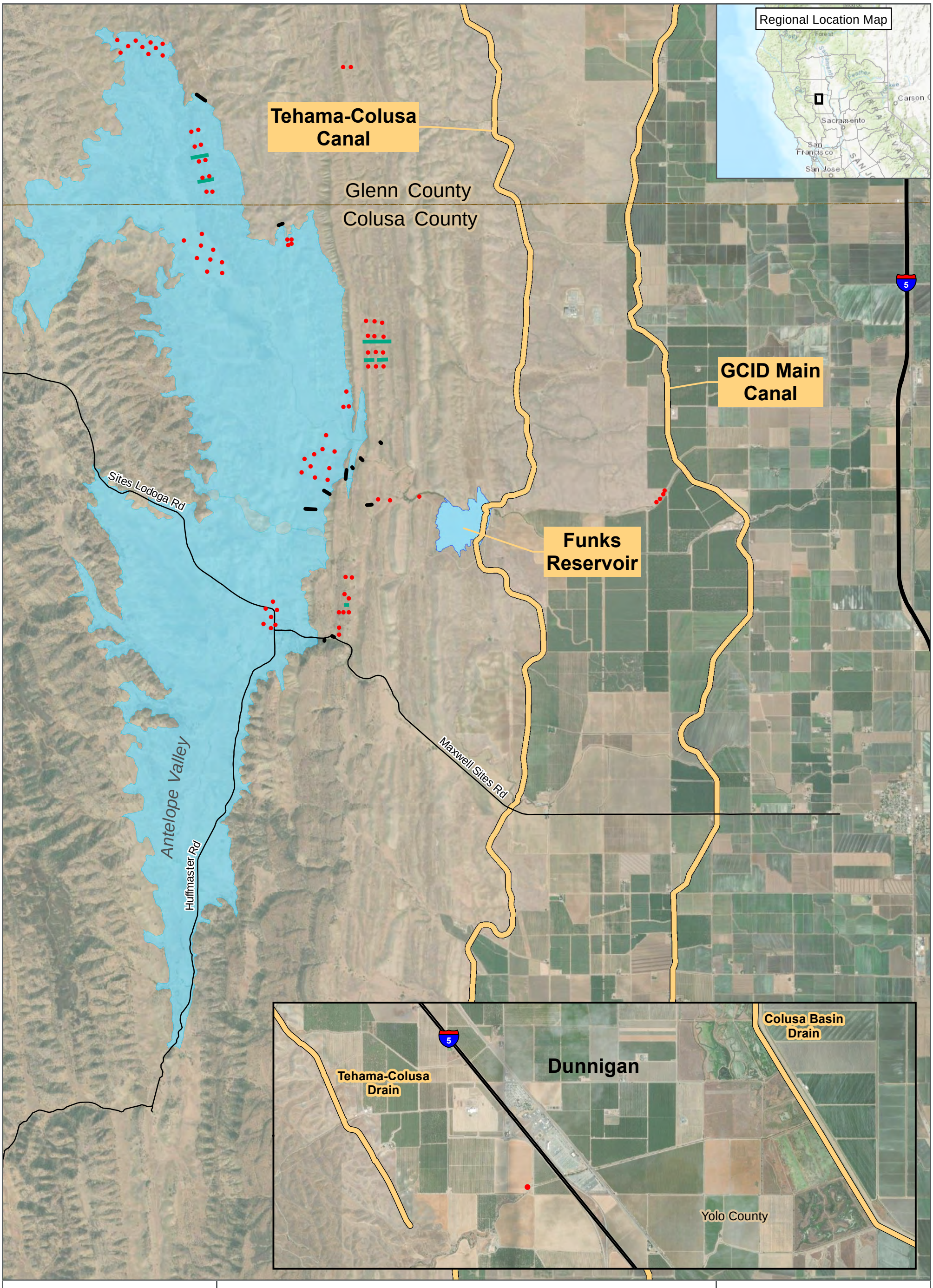

Figure 2, 2023-2024 Sites Reservoir Test Pits, Fault Studies, and Quarry Studies

Base Map Source: ICF, 2021
Imagery Source: ESRI World Imagery 2021
Coordinate System: NAD 1983 CA Zone II
Projection: Lambert Conformal Conic
Datum: North American 1983

DISCLAIMER: This exhibit is preliminary and is subject to change.

MAP DATE: 7/29/2022

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The number, type, and location of investigation points were selected based on experience of the project design engineers who are knowledgeable in complying with the design investigation requirements of various regulatory agencies, including the California Division of Safety of Dams.

Much of the environmental and regulatory setting information in this draft IS/MND is derived from the numerous technical analyses and studies and extensive data gathering efforts that have been conducted to date for the evaluation of the proposed Sites Reservoir Revised Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement. To supplement this information, the Authority conducted a comprehensive desktop analysis to identify locations for proposed investigations that would avoid and minimize effects on sensitive resources during early development of the Proposed Project. In support of this effort, the Authority referenced biological and cultural survey data collected by the California Department of Fish and Wildlife (CDFW) and the California Department of Water Resources (DWR) in much of the proposed Sites Reservoir footprint in Colusa and Glenn Counties in the early 2000s, as well as more recent wetland and waters mapping.

It is important to note that the current Proposed Project, consisting of the proposed test pits, and fault and quarry studies, is a preliminary action that is necessary to obtain the requisite data and information to support the ongoing efforts to formulate and refine the design of the proposed Sites Reservoir. The current Proposed Project does not in any way commit the Authority (or any other party) to any definite course of action regarding the proposed Sites Reservoir. The Authority retains all of its rights, discretion, authority and responsibility under CEQA with respect to the proposed Sites Reservoir, including the authority to make a final decision on whether or not to approve that proposed future Sites Reservoir project based on the evaluation of its environmental impacts, alternatives and mitigation measures. The evaluation of the proposed Sites Reservoir is being done separately from this IS/MND, pursuant to the requirements of CEQA and the National Environmental Policy Act. The Authority's decisions on whether, and if so, how, to approve the proposed Sites Reservoir will not be made until a Sites Reservoir Final Environmental Impact Report/Environmental Impact Statement is completed and considered by the decision-makers.[1]

2.3 Project Description

The purpose of the Proposed Project is to conduct investigations by test pits and trench excavations (for the fault and quarry studies) in order to obtain information necessary to support the ongoing engineering evaluations and design development for the proposed Sites Reservoir and associated facilities. In particular, many of the planned excavations would be completed at proposed quarry locations to gather information regarding the quantity and quality of borrow materials proposed for dam and reservoir feature construction fill, as well as assessing means and methods for excavation effort required. Other planned excavations would be used to gather information regarding the location and stratigraphy (study of the strata, or rock layers, that were deposited over time) in areas of suspected and known fault traces/zones and to further evaluate the areas for evidence of last movement. Finally, excavations at other feature locations would provide information for pipeline trench stability analysis.

Generally, the investigations would provide information on subsurface conditions up to 20 feet below grade at specific locations. A list of the Proposed Project's investigations, and the corresponding

[1] A Revised Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement (RDEIR/SDEIS) was publicly released for the proposed Sites Reservoir Project on November 12, 2021.

proposed Sites Reservoir feature to which the investigations pertain, is included in Table 1. Figure 2 (above) shows an overview of the locations of the proposed investigations; Appendix A. *Biological Resources Mapbook and Species Lists and Descriptions* provides a more detailed Mapbook that includes all investigation locations. All investigations, except for the one test pit in the Dunnigan area, would be in grasslands, open areas of oak savannas, and hayfields located north and east of the town of Sites. The Dunnigan area is generally agricultural, but the test pit would be in an area identified as disturbed habitat and is adjacent to ruderal habitat. See Section VI *Biological Resources* for more detail on habitat types in work areas. No tree removal or trimming is included in the Proposed Project.

Table 1. Investigation Types, Approximate Numbers, and Approximate Depths by Proposed Sites Reservoir Feature

Proposed Sites Reservoir Feature	Approximate Numbers, Investigation Types, and Approximate Depths
Sites Reservoir	Up to 76 test pits, 18 to 20 feet below grade Up to 9 fault studies, 10 to 15 feet below grade Up to 7 quarry studies, 15 to 20 feet below grade
Funks Reservoir	Up to 3 test pits, 18 to 20 feet below grade Up to 2 fault studies, 10 to 15 feet below grade
Terminal Regulating Reservoir and Pipeline	Up to 4 test pits, 18 to 20 feet below grade
Dunnigan Pipeline	Up to 1 test pit, 18 to 20 feet below grade
Total	**Up to 84 test pits, 18 to 20 feet below grade** **Up to 11 fault studies, 10 to 15 feet below grade** **Up to 7 quarry studies, 15 to 20 feet below grade**

The investigations are scheduled to occur between January 2023 and December 2024. The sequence would depend on site and seasonal conditions, as well as landowner access. All proposed investigations would be conducted during daylight hours and would be limited to the times allowed by the applicable local noise ordinance. Each investigation would take 1-2 days to complete for a test pit, up to 4 days for a quarry study, and up to 25 days for a fault study.

Project planning involved an extensive review of desktop aerial imagery and geographic information system (GIS) data with a goal of selecting investigation locations that would avoid potential sensitive resources to the extent possible, in light of the limited field survey documentation that is available. As noted in the discussion of Section 2.2 *Project Background*, CDFW and DWR conducted biological and cultural surveys in much of the proposed Sites Reservoir footprint in Colusa and Glenn Counties in 2000. The results of these previous surveys were obtained and reviewed to identify and propose investigation locations outside of identified sensitive habitats and known cultural sites. In addition, preliminary wetland and waters mapping has been completed as part of the proposed Sites Reservoir permitting efforts; this data was also used to determine the Project Area. As such, the proposed investigation locations have been selected to avoid all potentially jurisdictional wetlands or regulated waters of the U.S./State, and known cultural sites.

In addition to siting the investigation locations to avoid potential sensitive resources, access to the locations was examined during the desktop evaluation process. Though existing roads are the primary and more desired option, numerous investigation locations are anticipated to require overland access in areas where no roads exist or where existing roads are inaccessible. With avoidance of impacts to sensitive resources a key consideration in developing an overland access plan, engineers, cultural and biological specialists, and land access managers met multiple times to refine overland access routes. This process made it possible for the Authority to identify access routes which would avoid known culturally sensitive locations, known biological resources (e.g., wetland features, beds and banks of streams,

creeks, channels), and areas that were expected to cause increased landowner sensitivity (e.g., active orchards, grazing pastures).

2.3.1 Subsurface Investigations

The Proposed Project includes conducting subsurface investigations consisting of 84 test pits and trenches for 11 fault studies and 7 quarry studies throughout Colusa, Glenn, and Yolo counties (Table 1).

Descriptions for each subsurface investigation type are provided below.

Test Pits

Test pits would be used at proposed quarry locations to gather information regarding the quantity and quality of borrow materials proposed for dam and reservoir feature construction fill. In addition, test pits at other locations would provide information regarding pipeline trench stability analysis. Test pit locations were selected to provide sufficient assessment of feature footprints and would allow collection of soil samples for engineering and laboratory analysis. Work areas, which include equipment and vehicle staging areas, would be up to approximately 50 feet wide by 50 feet long for each test pit. Proposed test pit work areas would consist of the smallest footprint necessary to complete the investigations and would avoid or minimize impacts to biological resources, cultural resources, and any other sensitive resources. Using an excavator or backhoe, a rectangular hole with an approximate footprint of 18 feet by 18 feet would be excavated within the identified work area and samples would then be collected. Test pits would be approximately 18 to 20 feet deep, and excavation and sampling would take up to 1 day to complete at each location. Stockpiling of excavated materials would occur adjacent to the hole within the established 50-foot-wide work area. Test pits would be backfilled with the excavated material on the same day as they are excavated with the stockpiled soil placed and compacted in thin, moisture conditioned layers to the surface and the area restored, as closely as possible, to its pre-project or better conditions.

Fault Studies

Fault trenches would be used to gather information regarding the location and stratigraphy in areas of suspected and known fault traces/zones and to further evaluate the areas for evidence of last movement. Fault trenches have been sited at specific existing and suspected fault line locations in proximity to proposed Sites Reservoir features. Each trench would be approximately 5 feet wide and range from 200 to 600 feet long, and would vary from 10 to 15 feet deep. Work areas for fault trenches, which include equipment and vehicle staging areas, would be up to approximately 40 feet wide and range from 100 to 1,000 feet long. Proposed trench work areas would consist of the smallest footprint necessary to complete the investigations and would avoid or minimize impacts to biological resources, cultural resources, and any other sensitive resources. The trenches would be excavated using a conventional backhoe and be fitted with temporary shoring to prevent sidewall collapse. This would allow safety-trained geologists to enter the trench and observe exposed subsurface materials to study fault activity and stratigraphy contacts over a maximum 25-day period at each location. Stockpiling of excavated materials would occur adjacent to the trench within the established 40-foot-wide work area. Trenches would be temporarily covered with heavy duty plywood sheets (3/4 inch or thicker sheets) at the end of each workday. The ends of the trenches would be sloped and benched, as needed, to provide safe ingress and egress for workers. Once the trenching and mapping are complete, the trenches would be backfilled with excavated materials placed in thin lifts and tamped in place by the backhoe bucket and roller attachments, before a subsequent lift of material is placed as backfill. Lifts, or fill layers, will not exceed about 8 inches thick and allow for material to be replaced consistent with previous

conditions. Upon completion of each proposed investigation, the area would be returned to pre-project or better conditions.

Quarry Studies

Quarry study trenches would be used to gather information regarding the quantity and quality of borrow materials proposed for dam and reservoir feature construction fill and to assess the means and methods needed to remove overburden and rock materials during construction. These investigations would be conducted by trenching in areas of planned quarries for the proposed Sites Reservoir. Each trench would be up to 20 feet wide and range from 300 to 1,500 feet long, would vary from 15 to 20 feet deep, and would be excavated using a bulldozer. Work areas for the quarry studies, which would include equipment and vehicle staging areas, would be approximately 40 feet wide and range from 1,000 to 2,300 feet long. Proposed trench work areas would consist of the smallest footprint necessary to complete the investigations and would avoid or minimize impacts to biological resources, cultural resources, and any other sensitive resources. Stockpiling would occur adjacent to each trench within the established 40-foot-wide work area. Investigations at a quarry study site would occur in sections to minimize the length of trench open at any given time. Open portions of the trenches would be backfilled at the end of each day by track-walking excavated materials back into place by the dozer. Each quarry study trench will take up to 2 days to complete. Upon completion of work at a quarry study area, the area would be returned to pre-project or better conditions.

2.3.2 Investigation Equipment, Personnel, and Site Access

Activities at each investigation location would require up to 10 to 15 personnel, including equipment operators and assistants, a utility locator, a geologist/engineer to document conditions encountered, biological, cultural, and tribal monitors, project managers, and safety staff. It is anticipated that one team would be in the field at any given time.

Equipment, vehicles, and materials would be temporarily staged within each designated investigation work area. Equipment use would be planned to optimize onsite staging and reduce offsite traffic and travel. All staging areas would be located outside of wetlands and other aquatic resources and adhere to species-specific buffer zones. Workers in remote areas would be provided necessary onsite amenities (e.g., waste and sanitary facilities). All wastewater generated during implementation of the Proposed Project would be hauled off-site and disposed of at an approved facility that is permitted to receive wastewater in the quantities anticipated. Crew vehicles and equipment would access the investigation areas daily over the Proposed Project duration; carpooling would be encouraged to the extent feasible. Flaggers, cones, and other measures would be used to control the flow of traffic near active roadways, where necessary, and neighbors would be notified prior to commencement of Proposed Project activities in their area. Table 2 provides the estimated number of each type of equipment required by field team to complete the investigations included in the Proposed Project.

Table 2. Proposed Project Equipment and Anticipated Duration of Use

Equipment	Estimated Maximum Pieces of Equipment	Maximum Work Hours per Day
Skid Steer	2	12
Backhoe	2	12
Bulldozer	1	12
Water Trucks	2 (included for dust suppression)	12
ATV and Trailers	4	12
Pickup Trucks/Sport Utility Vehicles	4	12

Low-lying vegetation removal is anticipated within the footprint of the excavations and would be conducted with biological, cultural, and tribal resource monitors present. Vegetation removal would be completed in stages as excavation progresses using the planned excavation equipment. No tree removal or trimming is included in the Proposed Project.

Access to the proposed investigation areas would include vehicle travel via existing roadways and overland access routes. Access would use existing public and private roads to the extent possible. Minor maintenance, such as repairing potholes or impassable portions of roads, could occur, as necessary, for safe vehicle access. If required, the maintenance would be completed according to the applicable county standards. Where roads do not exist, some of the proposed investigation locations would require overland access through portions of grasslands and woodland open areas. No trees would be trimmed or removed for vehicle access.

Overland access routes would be as direct as possible. Minor drainage crossings, if necessary, will adhere to the following process:

1. Where possible, all drainage crossings would be avoided, and vehicles would go around any waterways so as to avoid entirely;
2. If avoidance is not entirely possible, crossing areas that are dry will be identified and used for vehicles;
3. Where avoidance or crossing-in-the-dry are not possible, field personnel would be required to use clean, contained, temporary cover such as steel plates or hard density plastic mats and place them over the drainage, in an area where no impacts would occur to the banks, for temporary vehicular access. No fill would be placed within any active waterway, and waterway crossings would be avoided to the extent possible.

Preferred access routes would be determined in the field during the pre-investigation siting surveys with biological, cultural, and tribal monitors present to avoid sensitive resources (Section 2.3.4) and finalized following Sites real estate team's coordination with landowners.

2.3.3 Standard Protocols and Procedures Incorporated into the Proposed Project

The following standard protocols and procedures have been incorporated as part of the Proposed Project and would be implemented prior to and throughout the proposed investigations. These standard protocols and procedures are summarized below and described further in Appendix B.

- **Stormwater Pollution Prevention Plan (SWPPP) and Best Management Practices (BMPs).** Stormwater measures and BMPs would be implemented pursuant to the State Water Resources Control Board's *National Pollutant Discharge Elimination System General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities*. BMPs would include temporary erosion control measures. Investigation-derived groundwater generated during field activities would be contained onsite and disposed of appropriately. In addition, any groundwater generated during field studies would be disposed of in accordance with applicable regulations and permitting requirements.

- **Spill Prevention and Hazardous Materials Management**. Hazardous materials and hazardous wastes including fuels, oils, grease, and lubricants would be used, stored, and disposed of in accordance with applicable regulations during the proposed investigations. Spill prevention and control BMPs would be followed to prevent or minimize effects from spills of hazardous or petroleum substances. Additional BMPs designed to avoid spills from equipment would also be implemented.

- **Standard Fugitive Dust Control**. Water would be applied as needed to minimize dust emissions. All visibly dry, disturbed, unpaved road surface areas of operation would be watered. Haul vehicles would be covered. Onsite vehicles would be limited to a speed of 15 miles per hour on unpaved roads, access routes over land, and on paved roads where traffic has been temporarily stopped for implementation of Proposed Project.

- **Standard Measures to Reduce Equipment Usage and Exhaust**. This measure includes a number of activities to reduce equipment usage and associated exhaust emissions. Key activities include the following: maintain equipment; minimize idling; comply with emission standards and requirements set by state regulations; utilize off-road equipment with tier 3 or higher certified engines; and utilize on-road vehicles with engines that are certified model year 2012 or newer.

- **Traffic Management and Hazards**. Haul and access routes selected during desktop analysis would be confirmed during field surveys described in the next section. Haul traffic would be dispersed when multiple investigation locations are under evaluation concurrently. Traffic control devices would be installed per State and County regulations to maintain safe driving conditions, including use of signage to alert motorists of activities and potential hazards, as well as the use of flaggers when appropriate.

- **Emergency Access**. Access for local emergency vehicles would be maintained on all roadways throughout the investigations and coordination with local service providers would be conducted.

- **Health, Safety, Security and Environmental Plan (HSSE Plan)**. A HSSE Plan would be prepared for the Proposed Project. The HSSE Plan would focus on minimizing releases, while acknowledging that releases may still occur and providing specific response activities that would be triggered in the event of a release. Safeguards which will be put into place include: an assessment of known hazards (if present), daily, work- specific tailgate meetings so safety and protection of the environment are foremost in workers minds; inspections of equipment to confirm they are in working order; use of plastic sheeting placed below all equipment which is stationary; provision of spill kits included at each work area; and daily observations of work areas by a qualified environmental practitioner.

- **Fire Prevention and Suppression at Investigation Locations**. All investigation locations would be kept in neat and clean order, and site inspections would be performed daily during field work and at the end/shut down of each workday. Flammables would be stored in appropriate containers at all times. Idling of vehicles would be avoided. Personnel working on site would receive site-specific training regarding fire prevention procedures and good practices, fire suppression methods, and appropriate chain of command and communication in the event of an emergency. Firefighting hand tools and equipment (shovels, spades, water tank and hoses for water spray) would be available at each location.

2.3.4 Sensitive Resources Mitigation Measures to be Implemented with Proposed Project

As described in the discussion of the *Project Background*, the proposed investigations have been sited through desktop evaluation and coordination with the engineering team to avoid sensitive resources and receptors. Access to the proposed investigation locations is limited due to the number of private properties in the Project Area, therefore, field verification to confirm that sensitive resources have been

fully avoided has not been conducted. For that reason, there remains a potential for effects to sensitive resources at the proposed investigation locations.

As a result, the Authority proposes to implement two general mitigation measures, as described in Table 3. MM Gen-1 requires that a pre-investigation siting survey is conducted at least one week prior to mobilization at each proposed investigation location. If implementation of MM Gen-1 and other resource-specific mitigation measures presented in this IS/MND for biological resources, cultural resources, paleontological resources, or tribal cultural resources do not avoid significant impacts to sensitive resources, and resource avoidance would require relocation of the investigation outside of where data collection is needed to inform design, then the Authority will reevaluate the need for an investigation at that specific location as part of the overall Proposed Investigation Plan and implement MM Gen-2.

Under MM Gen-2, the Authority will reprioritize a specific investigation site within the Proposed Project schedule, including potentially changing the schedule to conduct the relevant investigation at a different time of the year, when impacts may be avoided. Under MM Gen-2, if rescheduling of a specific investigation will not avoid significant impacts, then the investigation will be removed from the Proposed Project and postponed to a subsequent effort that would require separate environmental documentation and permitting, as applicable to that subsequent investigation and at the time it is proposed for approval.

Table 3. Mitigation Measures Gen-1 and Gen-2

MM Gen-1: Conduct Pre-Investigation Siting Survey	At least one week prior to mobilization for Proposed Project activities at each investigation location, the Proposed Project contractor and staff, along with a qualified biologist, a cultural resources specialist, and a tribal monitor will conduct a pre-investigation siting survey. Following review of the proposed site locations and investigation plan, the team will conduct a coordinated field survey and provide recommendations to the Proposed Project team to assist in finalizing investigation sites and provide findings as to the extent of the ground surface preparations (if any) that would be needed at each location. The team will also confirm the means of access by personnel and equipment, which includes the biologist, tribal and cultural specialist demarcating the overland access route that avoids impacts to any identified sensitive resources during the siting survey. Adjustments in the exact location of the investigation areas and in the application of species/habitat-specific mitigation measures may be required to avoid or minimize impacts to sensitive resources, to avoid potential utility conflicts, or if specific site conditions are different than anticipated. These adjustments will be limited to the vicinity of the general investigation locations shown in Figure 2 and will remain compliant with any permit restrictions placed on specific areas in the Project Area.
MM Gen-2: Reprioritize or Postpone Proposed Investigations if Sensitive Resources Cannot be Avoided	If implementation of MM Gen-1 and cultural or species/habitat-specific mitigation measures do not avoid or minimize permanent impacts to sensitive resources, and resource avoidance would require relocation of the investigation location outside of the area where data collection is needed to inform design, then the need for an investigation at that specific location would be re-evaluated as part of the overall Proposed Project investigation plan and, if found to be necessary, the effort would be reprioritized within the Proposed Project schedule to avoid significant impacts (e.g., moving investigation to later date in schedule to avoid an active bird nest) or postponed to a subsequent investigation effort that would require separate environmental evaluation and permitting, as applicable.

2.3.5 Discretionary Public Agency Permits and Approvals that May Be Required

Table 4 lists the discretionary public agency approvals (other than the Authority's approval as the agency that will carry out the Project) needed for the Project investigations. The only applicable discretionary permits are local (county) permits.

Table 4. Discretionary Public Agency Permits and Approvals

Agency	Discretionary Permit or Approval	Description and Applicability to the Proposed Action	Authority
Public Works Departments of Colusa, Glenn, and Yolo Counties	Encroachment Permits	Related to investigations within local jurisdiction's right-of-way and roadways	County ordinances

3.0 Aesthetics

Environmental Issue Area	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Except as provided in Public Resources Code Section 21099, would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic building 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 points). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☐	☒
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

Environmental Setting

The Project Area generally includes the areas in and near the Antelope Valley in Colusa and Glenn Counties along with areas near the town of Dunnigan in Yolo County. Most of the properties within the Antelope Valley are grazing lands that are not actively cultivated. The Dunnigan area is predominantly agricultural. The Project Area is primarily rural in character, containing a limited number of rural residences and businesses.

Impact Analysis

a) There are no scenic vistas within or near the Project Area. Therefore, the Proposed Project would not adversely affect a scenic vista, resulting in no impact.
b) The Project Area is not located in the vicinity of a designated state scenic highway (California Department of Transportation [Caltrans] 2022). Therefore, the Proposed Project would not damage scenic resources within a state scenic highway, resulting in no impact.

c) The Proposed Project would not change the permanent visual character of the area because upon completion of each proposed study, the area would be returned to its pre-project or better conditions. Public views of the Proposed Project from local roads may experience altered visual environments during the proposed studies. Each investigation would take 1-2 days to complete for a test pit, up to 4 days for a quarry study, and up to 25 days for a fault study. The Proposed Project involves temporary, discrete, and localized investigations that would not permanently degrade the quality of public views of the site. Therefore, the Proposed Project would not degrade the existing visual character or quality of public views of the site, resulting in no impact.

d) The Proposed Project would be conducted during daylight hours. Therefore, the Proposed Project would not create a new source of light or glare which would adversely affect day or nighttime views in the area, resulting in no impact.

4.0 Agriculture and Forestry Resources

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.				
Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☒	☐
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?	☐	☐	☐	☒

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☐	☒	☐

Environmental Setting

The Proposed Project is located in Colusa, Glenn, and Yolo Counties. In 2018, Colusa County had 559,477 acres of agricultural land, 173,511 acres of other land, 5,509 acres of urban and built-up land, and 1,887 acres of water area (Department of Conservation [DOC] 2022a). In 2018, Glenn County had 574,731 acres of agricultural land, 262,116 acres of other land, 6,480 acres of urban and built-up land, and 5,804 acres of water area (DOC 2022b). In 2018, Yolo County had 522,865 acres of agricultural land, 94,999 acres of other land, 31,353 acres of urban and built-up land, and 4,233 acres of water area (DOC 2022c).

Impact Analysis

a) A review of the DOC's California Important Farmland Finder indicates that the proposed investigations within Colusa County would be located on lands designated as Prime Farmland and Farmland of Local Importance (DOC 2022d). The proposed investigations within Glenn County would be located on lands designated as Farmland of Local Importance, Farmland of Local Potential, and Grazing Land (DOC 2022d). The proposed investigations within Yolo County would be located on lands designated as Prime Farmland (DOC 2022d). Each investigation would take 1-2 days to complete for a test pit, up to 4 days for a quarry study, and up to 25 days for a fault study. Each investigation sites would constitute less than 0.025 acre of ground disturbance. As a result, the Proposed Project would result in minor, localized, and temporary effects immediately surrounding each investigation site and would not permanently affect existing farmland. No farmland would be converted as a result of the Proposed Project because each investigation site would be restored to its pre-project or better condition once the investigation is complete. Therefore, the Proposed Project would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use, resulting in a less-than-significant impact.

b) The proposed investigations within Colusa County would be located on lands zoned as F-A Foothill Agriculture, E-A Exclusive Agriculture, and State, Federal, and Other Agency Lands (Colusa County 2022). The proposed investigations within Glenn County would be located on lands zoned as Agricultural Preserve AP (Glenn County 2022). The proposed investigations within Yolo County would be located on lands zoned as C-H Highway Service Commercial (Yolo County 2022). Most of the proposed investigations would be located on parcels that are contracted under the Williamson Act (Colusa County 2022, Glen County 2022, and Yolo County 2022). The Proposed Project would result in minor, localized and short-term effects immediately surrounding each investigation site and would not affect existing zoning or Williamson Act parcels. Each investigation site would be restored to its original conditions once the investigation is complete. Therefore, the Proposed Project would not conflict with existing

zoning for agricultural use, or a Williamson Act contract, resulting in a less-than-significant impact.

c) No lands within the Project Area are zoned as forest land or timberland (Colusa County 2022, Glenn County 2022, and Yolo County 2022). Therefore, the Proposed Project would not conflict with existing zoning for, or cause rezoning of forest land, timberland, or timberland zoned Timber Production. As a result, no impact would occur.

d) No forest lands are located within the Project Area. Therefore, the Proposed Project would not result in the loss of forest land or conversion of forest land to non-forest use. As a result, no impact would occur.

e) The majority of the proposed investigations would occur on agricultural land. Access to the investigation sites would include vehicle travel via existing roadways and overland access routes and would not convert farmland to non-agricultural use. Equipment, vehicles, and materials would be temporarily staged at each designated Investigation location and would not convert farmland to non-agricultural use. The Proposed Project would result in minor, localized, and short-term effects immediately surrounding each investigation site and would not affect existing farmland. No farmland would be converted as a result of the Proposed Project because each investigation site would be restored to its original conditions once the investigation is complete. There is no forest land in the Project Area; therefore, no forest land would be converted to non-forest use. The Proposed Project would not involve other changes in the existing environment that due to their location or nature could result in the conversion of farmland to non-agricultural use or the conversion of forest land to non-forest use. Therefore, impacts would be less than significant.

5.0 Air Quality

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations.				
Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	☒	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
d) Result in other emissions (such as those leading to odors adversely affecting a substantial number of people?	☐	☐	☒	☐

Environmental Setting

The Proposed Project is located within Colusa, Glenn, and Yolo Counties. These counties are all located within the Sacramento Valley Air Basin (SVAB). The SVAB's topographic features restrict air movement through and out of the basin. As a result, the northern SVAB is highly susceptible to pollutant accumulation over time. In addition, transport of pollutants into the northern SVAB from the Sacramento Metropolitan Area is primarily influenced by air movement northward. Sources in the Sacramento Metropolitan Area contribute to the region's poorest air quality, which typically occurs during the summer months.

The pollutants introduced into the ambient air by stationary and mobile sources are categorized as primary and/or secondary pollutants. Primary air pollutants are those that are emitted directly from sources. Carbon monoxide (CO), reactive organic gases (ROG), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), inhalable particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), and lead (Pb) are primary air pollutants. ROG and nitrogen oxides (NO_X) are criteria pollutant precursors that form secondary criteria air pollutants such as ozone through chemical and photochemical reactions in the atmosphere.

The federal Clean Air Act (CAA) requires the USEPA to establish and maintain the National Ambient Air Quality Standards (NAAQS) for seven criteria air pollutants that have been linked to potential health concerns: Ozone, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and Pb. The California CAA is administered by the California Air Resources Board (ARB) at the state level and by the air quality management districts and air pollution control districts at the regional and local levels. In California, the ARB has established the California

Ambient Air Quality Standards (CAAQS). CAAQS are generally more stringent than the corresponding federal standards and incorporate additional standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles.

Table 5 lists the attainment status for the NAAQS in the three counties.

Table 5. Federal Attainment Status for Colusa, Glenn, and Yolo Counties

Pollutant	Colusa County	Glenn County	Yolo County
Ozone	Attainment/Unclassified	Attainment/Unclassified	Nonattainment
Carbon Monoxide (CO)	Attainment/Unclassified	Attainment/Unclassified	Attainment/Unclassified
Nitrogen Dioxide (NO_2)	Attainment/Unclassified	Attainment/Unclassified	Attainment/Unclassified
Sulfur Dioxide (SO_2)	Attainment/Unclassified	Attainment/Unclassified	Attainment/Unclassified
Coarse Particulate Matter (PM_{10})	Unclassified	Unclassified	Unclassified
Fine Particulate Matter ($PM_{2.5}$)	Attainment/Unclassified	Attainment/Unclassified	Nonattainment
Lead (Pb)	Attainment/Unclassified	Attainment/Unclassified	Attainment/Unclassified

Source: ARB 2022a

Table 6 lists the attainment status for the CAAQS in the three counties.

Table 6. State Attainment Status for Colusa, Glenn, and Yolo Counties

Pollutant	Colusa County	Glenn County	Yolo County
Ozone	Attainment	Attainment	Nonattainment
Carbon Monoxide (CO)	Unclassified	Unclassified	Attainment
Nitrogen Dioxide (NO_2)	Attainment	Attainment	Attainment
Sulfur Dioxide (SO_2)	Attainment	Attainment	Attainment
Coarse Particulate Matter (PM_{10})	Nonattainment	Nonattainment	Nonattainment
Fine Particulate Matter ($PM_{2.5}$)	Attainment	Attainment	Unclassified
Lead (Pb)	Attainment	Attainment	Attainment
Sulfates	Attainment	Attainment	Attainment
Hydrogen Sulfide	Unclassified	Unclassified	Unclassified
Vinyl Chloride	No designation	No designation	No designation
Visibility Reducing Particles	Unclassified	Unclassified	Unclassified

Source: ARB 2022a

Colusa and Glenn Counties are designated as attainment or unclassified for all pollutants for NAAQS (ARB 2022a). For NAAQS, Yolo County is designated as nonattainment for ozone and $PM_{2.5}$ and attainment or unclassified for all other pollutants (ARB 2022a). For CAAQS, Colusa and Glenn Counties are currently designated as nonattainment for PM_{10} and attainment or unclassified for all other pollutants (ARB 2022a). Yolo County is designated as nonattainment for ozone and PM_{10} for CAAQS and attainment or unclassified for all other pollutants for CAAQS (ARB 2022a).

Air quality in the three counties is regulated by the Glenn County Air Pollution Control District (GCAPCD), Colusa County Air Pollution Control District (CCAPCD), and Yolo Solano Air Quality Management District (YSAQMD), respectively. GCAPCD and CCAPCD have not established air quality significance thresholds. YSAQMD published the Handbook for Assessing and Mitigating Air Quality Impacts (YSAQMD 2007), which identifies CEQA thresholds of significance for certain criteria air pollutants. The construction thresholds of significance adopted by the YSAQMD are presented in Table 7.

Table 7. YSAQMD Thresholds of Significance

Pollutant	Construction Threshold
ROG	10 tons/year
NO_X	10 tons/year
$PM_{2.5}$	80 lbs/day

Source: YSAQMD 2007

Notes: ROG = reactive organic gases, NO_X = nitrogen oxides, $PM_{2.5}$ = fine particulate matter, lbs = pounds

Some receptors are considered more sensitive than others to air pollutants. The reasons for greater than average sensitivity include pre-existing health problems, proximity to emission sources, or the duration of exposure to air pollutants (YSAQMD 2007). A sensitive receptor is defined as a location where human populations, especially children, seniors, or sick persons are found, and there is reasonable expectation of continuous human exposure according to the averaging period for the ambient air quality standards (e.g., 24-hour, 8-hour, 1-hour). Examples of sensitive receptors include residences, hospitals, and schools (YSAQMD 2007).

The closest sensitive receptors to the proposed investigations are residences located in the community of Sites approximately 140 feet away.

Impact Analysis

a) As discussed above, GCAPCD and CCAPCD have not established air quality significance thresholds. YSAQMD has established CEQA guidelines that set forth significance thresholds, below which a project may be safely assumed to conform to the relevant air quality plans for this area. Implementation of the Proposed Project would generate short-term criteria pollutant emissions. As shown in Table 7, the Proposed Project criteria pollutant emissions would be below the significance thresholds adopted by YSAQMD. The Proposed Project would not create a permanent stationary source of air contaminants, include a land use that would generate a substantial number of trips from mobile sources, or involve the use of high-ROG architectural coatings or solvents. Therefore, the Proposed Project would not conflict with or obstruct implementation of the relevant air quality plans, resulting in no impact.

b) Implementation of the Proposed Project would result in minor criteria pollutant emissions from the use of Proposed Project equipment listed in Table 2. The proposed investigations would occur between January 2023 and December 2024. Activities at each investigation location would require up to 10 to 15 personnel. Each investigation site would be active for a period ranging from 1 day to 25 days, depending on the conditions and investigation type. Individual investigation sites would constitute less than 0.025 acre of ground disturbance. The total area of ground disturbance associated with the Proposed Project would be approximately 6.2 acres.

   Criteria pollutant emissions generated during the proposed investigations were estimated using the California Emissions Estimator Model (CalEEMod) version 2020.4.0. The detailed CalEEMod output is included as Appendix C. As discussed above, GCAPCD and CCAPCD have not established air quality significance thresholds. The estimated criteria pollutant emissions during Proposed Project implementation were compared against the YSAQMD thresholds to determine the significance of air quality impacts. Table 8 compares the Proposed Project criteria pollutant emissions against the YSAQMD thresholds.

Table 8. YSAQMD Thresholds of Significance

Emissions	ROG (tons/year)	NO_X (tons/year)	$PM_{2.5}$ (lbs/day)
2023	1.15	8.79	7.50
2024	1.13	8.30	7.35
Maximum Emissions	**1.15**	**8.79**	**7.50**
YSAQMD Thresholds	10	10	80
Exceeds YSAQMD Thresholds?	**No**	**No**	**No**

Source: Appendix C

Notes: ROG = reactive organic gases, NO_X = nitrogen oxides, $PM_{2.5}$ = fine particulate matter, lbs = pounds

As shown in Table 8, the criteria pollutant emissions generated during implementation of the Proposed Project would be below the thresholds of significance adopted by YSAQMD. Implementation of Standard Protocols and Procedures related to fugitive dust control and equipment exhaust reduction will further avoid and minimize the potential for impacts on air quality through the use of BMPs. Therefore, the Proposed Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under the applicable federal or state ambient air quality standard, resulting in a less-than-significant impact.

c) The majority of the proposed investigations are in remote locations, outside of the immediate vicinity of nearly all sensitive receptors within the Project Area. As discussed above, the closest sensitive receptors to the proposed investigations are residences located in the community of Sites approximately 140 feet away. Use of Proposed Project equipment listed in Table 2 has the potential to generate toxic air contaminants, specifically diesel particulate matter, that could affect the nearest sensitive receptors. However, the Proposed Project would be temporary and short-term. Each investigation would take 1-2 days to complete for a test pit, up to 4 days for a quarry study, and up to 25 days for a fault study. As a result, operation of Proposed Project equipment would occur intermittently throughout the duration of the Proposed Project rather than continuously at any one location within the Project Area. Periodic operation of equipment would allow for dispersal of toxic air contaminants by avoiding continuous activity near the closest sensitive receptors. Implementation of Standard Protocols and Procedures related to equipment exhaust reduction will further avoid and minimize the potential for impacts on sensitive receptors. Therefore, the Proposed Project would not expose sensitive receptors to substantial pollutant concentrations, resulting in a less-than-significant impact.

d) The Proposed Project would generate diesel exhaust emissions from the use of equipment. The diesel exhaust emissions would be intermittent and temporary and would dissipate rapidly from the source with an increase in distance. No other odors would be generated by the Proposed Project. Therefore, the Proposed Project would not generate emissions of odors affecting a substantial number of people, resulting in a less-than-significant impact.

6.0 Biological Resources

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and 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 wildlife nursery sites?	☐	☐	☒	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☒	☐	☐

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☐	☐	☒

Environmental Setting

The Proposed Project is situated between the Inner North Coast Ranges District of the Northwestern California Region and the Sacramento Valley Subregion of the Great Central Valley Region, which are both part of the California Floristic Province (Baldwin et al. 2012). The Proposed Project is located within the Coast Range foothills surrounding the Antelope Valley and in a long swath of the northwestern Sacramento Valley. The topography of the Proposed Project varies from west to east. The west side is characterized by low rolling foothills and elevations range from approximately 400 to 800 feet above mean sea level (msl) in the hills surrounding Antelope Valley to 200 feet above msl in the Funks Reservoir area. From the Funks Reservoir, the valley gently slopes to the Proposed Project's lowest point, which is approximately 30 feet above msl at the eastern edge south of Dunnigan.

To identify the biological resources in the study area, previous survey results were reviewed from work conducted by the California Department of Fish and Game and the California Department of Water Resources from 1998 to 2004 (CDFG 2003a, 2003b; DWR, 2000a; Authority and Reclamation, 2021). ICF also queried several databases for information on species, including the California Natural Diversity Database (CNDDB) (CDFW, 2021), the California Native Plant Society Inventory of Rare and Endangered Plants (2020), the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation species list (USFWS, 2021), and the National Marine Fisheries Service species list (National Marine Fisheries Service 2021). These lists are included in ***Appendix A***. Landcover in and adjacent to the proposed investigation locations was mapped through aerial photo interpretation using Google Earth and National Agricultural Imagery Program imagery and topographic data (***Appendix A***) to avoid siting the proposed investigations on or near sensitive biological resources, including but not limited to nesting and foraging habitat, aquatic and terrestrial habitat. To confirm the results of the desktop evaluation and determine if any potential impacts exist to sensitive biological resources, as discussed in the *Project Description*, the Authority will conduct a pre-investigation siting survey (MM Gen-1) at least one week prior to mobilization.

The biological setting for the Proposed Project is composed of vegetation communities that support wildlife. The most abundant plant community is annual grassland, with areas of oak savanna and blue oak woodlands becoming more common as elevations increase from east to west and eventually transitioning to chamise and foothill pine in the westernmost part of the Proposed Project. Riparian woodland and wetlands are present along most of the major creeks in the vicinity including Antelope, Funks, Grapevine, and Stone Corral and their associated tributaries. Open water types include Salt Pond and small stock ponds. Wetland types include forested wetland, freshwater marsh, managed wetland, scrub-shrub wetland, seasonal wetland, and rice fields. Seasonal wetlands are located in grasslands and topographic lows where clay soils are present. Non-wetland waters identified include canal, ditch, pond, reservoir, ephemeral stream, intermittent stream, and perennial stream. To the east, agricultural areas

containing rice and orchards are the most abundant land cover type. In the southern portion of the Proposed Project, near Dunnigan, the vicinity is characterized by orchards, Bird Creek, and large areas of rice fields.

Natural Communities

The aerial images reviewed covered a range of dates (approximately 1998–2019), but use of recent imagery was emphasized, which allowed for interpretation of typical site conditions. In particular, the National Agricultural Imagery Program imagery from 2020 and Google Earth aerial images from multiple years, but especially March 2016, May 2017, and August 2018, were inspected for signatures that could be indicative of soil saturation, flooding or ponding, or relative wetness and shifts in vegetation type and cover. Google Earth aerial images were used to identify where water lines or flow patterns end, and vegetation begins. Channel incision and abrupt breaks in slope (sometimes indicated by shadows and seen in the elevation profile of a channel in Google Earth) were also used as a basis for identifying water lines for aquatic features. This section describes the natural communities that were identified to be present in and adjacent to the Project Area. Some natural communities described below occur adjacent to the area in order to consider potential effects on nesting birds associated with the investigations. The different types of natural and aquatic communities are discussed below, along with areas of cropland and man-made water features in and adjacent to the study area. The characteristic plant species present in each natural community are described below. The special-status plant and animal species that have a potential to occur in these communities are presented in the next section.

Annual Grassland

The primary vegetation type in the study area is grassland. Grassland consists of open areas lacking woody vegetation and is characterized by herbaceous vegetation dominated by grasses, although flowering forbs are often a conspicuous component of the plant cover. In the study area, this vegetation type is best classified as annual grassland, because the dominant species are annual grasses introduced from the Mediterranean Basin, such as bromes (*Bromus spp*.) wild oats (*Avena spp*.), barleys (*Hordeum spp*.), and ryegrass (*Festuca perenne*). Annual grassland in the study area is highly diverse and contains multiple microhabitats, including vernal pools and swales, clay flats, alkaline grassland, alkaline wetland, talus slopes, bunchgrass (*Stipa spp*.) stands, and wildflower fields. Although much of the vegetation cover is composed of nonnative annual grasses, many species of native grasses and forbs are present, and the microhabitats scattered throughout the grassland support special-status plants. Some areas are dominated by invasive plant species, such as yellow star-thistle (*Centaurea solstitialis*).

Oak Woodlands

Oak woodland is also prevalent in the study area, occurring mostly in the western portion in Colusa County. Dominant species include a mix of oak species (*Quercus spp*.) including coast live oak (*Q. agrifolia*), blue oak (*Q. douglasii*), and valley oak (*Q. lobata*). Much of the understory is dominated by annual grasses including bromes, barleys, and ryegrasses as well as wildflower fields. Much of the oak woodland areas are vast and undisturbed located on gently rolling hillsides adjacent to the valley floor.

Riparian Forest, Woodland, and Scrub

Riparian vegetation is found intermittently throughout and adjacent to the study area, generally occurring as narrow strips along streams, and as tree-lined canals Riparian vegetation occurs along Funks Creek, Stone Corral Creek, Antelope Creek, Bird Creek, and other smaller unnamed streams. Dominant tree species in the riparian forest and woodland include Fremont cottonwood (*Populus fremontii*) and willows (*Salix gooddingii, S. laevigata*). Valley oaks are occasionally present. Riparian

scrub is dominated by shrubby willows (*S. exigua* and others). The understory of this vegetation type contains various shrub, vine, and herbaceous species. Several nonnative tree species are also present, such as walnuts (*Juglans* spp.), fig (*Ficus carica*), and tree-of-heaven (*Ailanthus altissima*). Most of the patches of riparian habitat within the non-cropland study areas are small, sparse, and degraded by intensive cattle use. A more extensive stand of riparian forest is located along the Sacramento River, outside of the study area.

Cropland

Vegetation in the east side of the study area and adjacent to the proposed Dunnigan Pipeline and associated facilities consists primarily of cropland. Cropland encompasses all areas where the native vegetation has been cleared for agriculture, including rice fields, orchards, and row crops. Within the cropland vegetation type, small patches of ruderal (repeatedly disturbed) habitat are present adjacent to the cultivated fields, roads, levees, and other infrastructure.

Freshwater Marsh

Freshwater marsh consists of wetlands dominated by emergent, perennial herbaceous species. In the study area, the dominant species are cattails (*Typha* spp.) and rushes (*Schoenoplectus* spp.), but sedges (*Carex* spp.), spikerushes (*Eleocharis* spp.), and shrubby willows are sometimes present. Small patches of freshwater marsh associated with riparian areas, ponds, and ditches are scattered throughout the study area.

Seasonal Wetland

Seasonal wetlands are scattered throughout the annual grasslands in the study area. Seasonal wetlands are inundated by surface water or saturated by groundwater during the winter and spring months. Most of these seasonal wetlands are dry by early summer, and in the study area they are strongly associated with low-lying areas of clay or clay loam soils. Many of the plants found in these wetlands are dry and brown during the summer months, making the wetlands almost indistinguishable from the surrounding annual grasslands. Seasonal wetlands include vernal pools, alkaline wetlands, vernal swales, clay flats, and other wetlands that have formed because of human activities (e.g., drainages blocked by roads or disturbed areas within heavy clay soils). Dominant plant species include spike rush (*Eleocharis macrostachya*), Mediterranean barley (*Hordeum marinum* subsp, *gussoneanum*), and dock (*Rumex* ssp.).

Many of the vernal pools found within the study area have very low plant species diversity (DWR, 2000a). Pools at the northeastern edge of the study area tend to be larger and have greater plant species diversity. Species typically associated with vernal pools include coyote thistle (*Eryngium castrense*), popcorn flower (*Plagiobothrys* ssp.), and hyssop loosestrife (*Lythrum hyssopifolium*).

Most of the alkaline wetlands in the general study area are also seasonal but are vastly different in plant species composition from vernal pools and other freshwater seasonal wetlands (DWR, 2000a). The annual and perennial species in these areas are tolerant of alkali conditions. Most of these wetlands are dominated by salt grass (*Distichlis spicata*), with various other species including sickle grass (*Parapholis incurva*), alkali heath (*Frankenia salina*), alkali weed (*Cressa truxillensis*), and salt marsh bulrush (*Scirpus maritimus*).

Pond

Ponds in the study area are small reservoirs constructed by placing dams on ephemeral streams to capture and store runoff for livestock use. These ponds are mostly unvegetated, although freshwater

marsh is infrequently found at the edges of some ponds. These ponds support almost no native flora, and most of the plants are invasive aquatic species (Authority and Reclamation, 2021). Species typical of this habitat include common cocklebur (*Xanthium strumarium*) and dock species.

Reservoir

Funks Reservoir is located on Funks Creek approximately 7 miles northwest of the town of Maxwell, in Colusa County. Constructed in 1975 by the Bureau of Reclamation (Reclamation), Funks Reservoir is a reregulating reservoir that balances water level operations of the Tehama-Colusa Canal (TCC) upstream and downstream of Funks Creek. It has a designed storage capacity of approximately 2,200 acre-feet and a surface area of 232 acres. The typical summer releases from Funks Reservoir to the lower portions of TCC range from 500 cubic feet per second (cfs) to 1,000 cfs. Total flows of 50 cfs to 200 cfs for off-peak limited agricultural releases are needed from November to February, and sometimes into March, depending on the weather (DWR 2003).

Funks Reservoir is bounded primarily by annual grasslands composed of mostly weedy nonnative species. Very few trees or wetlands occur along the water's edge. Seasonal wetlands occur along drainages above the reservoir water's edge (Authority and Reclamation, 2021).

Waterways

Waterways within the study area consist of streams (ephemeral, intermittent, and perennial), canals, irrigation ditches, and a river. Waterways that could be affected by investigations include Funks, Stone Corral, and Antelope creeks, and numerous unnamed irrigation ditches and ephemeral streams. All flow through irrigated pasture, rice fields, and row crop agriculture until they flow into the Colusa Basin Drain east of the Project Area. These creeks are incised and revetted in some areas, and have been straightened and altered by farming practices.

Waterways with adjacent riparian and emergent wetland vegetation provide food, water, and migration and dispersal corridors, as well as escape, nesting, and thermal cover for a variety of wildlife and fish species. The open water areas of rivers and creeks provide resting and escape cover for many species of waterfowl and other waterbirds. Insectivorous birds, such as swallows, swifts, and flycatchers catch insects over open water areas. Shoreline and shallow water areas provide foraging opportunities for waterfowl, herons, and shorebirds. Riparian vegetation provides cover, nesting, and foraging opportunities for many wildlife species (Mayer and Laudenslayer 1988: 86, 130). Wildlife diversity and use is generally reduced in areas that do not contain riparian vegetation or that are covered with riprap. Wildlife that may use the river or its banks include Western pond turtle (*Emys marmorata*), Western fence lizard (*Sceloporus occidentalis*), which occurs primarily in riprap areas, diving and dabbling ducks, raccoon (*Procyon lotor*), and striped skunk (*Mephitis mephitis*).

Waterways in the study area fall within the Sacramento-San Joaquin Province (Central Valley Subprovince), one of six aquatic zoogeographic provinces in California, as defined by Moyle (2002). The Sacramento-San Joaquin Province is drained by the Sacramento and San Joaquin rivers. Generally, four native fish assemblages can be recognized in Central Valley streams: rainbow trout assemblage, California roach assemblage, pikeminnow-hardhead-sucker assemblage, and deep-bodied fish assemblage (Moyle, 2002). Based on their geographic location, the waterways within the study area are characterized by the deep-bodied fish assemblage and the pikeminnow-hardhead-sucker assemblage. Native fish species common to these two zones include Sacramento pikeminnow (*Ptychocheilus grandis*), Sacramento sucker (*Catostomus occidentalis*), Sacramento hitch (*Lavina exilicauda exilicauda*), Sacramento blackfish (*Orthodon microlepidotus*), hardhead (*Mylopharodon conocephalus*), tule perch (*Hysterocarpus traskii*), speckled dace (*Rhinichthys osculus*), California roach (*Lavinia symmetricus*), and

riffle sculpin (*Cottus gulosus*). Introduced species also found in these zones include black bass (largemouth, smallmouth, spotted) (*Micropterus* spp.), sunfish (*Lepomis* spp.), striped bass (*Morone saxatilis*), and American shad (*Alosa sapidissima*). Anadromous species passing through or spawning in these zones include steelhead (*Oncorhynchus mykiss*), Chinook salmon (*Oncorhynchus tshawytscha*), lamprey (*Lampetra* and *Entosphenus* spp.), and sturgeon (*Acipenser* spp.).

Ephemeral and Intermittent Streams, Canals, and Ditches

With the exception of the irrigation ditches and canals, all of these waterways are natural channels that drain the west side of the Sacramento River Valley and flow to the Colusa Basin, and subsequently the Sacramento River via the Colusa Basin Drain. With the advent of agriculture in the region, most reaches of these waterways were channelized and some were dredged to carry agricultural runoff in addition to natural flows (Brown, 2000). Most irrigation ditches in the study area are earthen channels, while the larger irrigation canals are concrete lined.

Stream flow in these drainages peaks during winter months in response to runoff during winter storms. Flow returns to high levels in the valley reaches of these streams during late summer when rice fields are drained. During summer, many of the reaches in these streams are dry, except for occasional pools or periods when receiving agricultural drainage or runoff. Water quality in these creeks is reported to be generally poor and high in dissolved minerals (Brown, 2000).

Special-status Species

For the purpose of this IS/MND, the following are considered special-status species:

- Species listed or proposed for listing as threatened or endangered under ESA (50 Code of Federal Regulations [CFR] 17.11 [listed animals], 50 CFR 17.12 [listed plants], and various notices in the Federal Register [FR] [proposed species]).
- Species that are candidates for possible future listing as threatened or endangered under ESA (81 FR 87246, December 8, 2021).
- Species listed or proposed for listing by the State of California as threatened or endangered under California Endangered Species Act (14 California Code of Regulations 670.5).
- Species that meet the definitions of rare or endangered under the CEQA (see State CEQA Guidelines Section 15380).
- Plants listed as rare under the California Native Plant Protection Act (California Fish and Game Code Section 1900 et seq.).
- Plants with a California Rare Plant Rank of 1 or 2 (California Native Plant Society, 2020).
- Wildlife species of special concern to the CDFW, Special Animals List (CDFW, 2021).
- Fish species of special concern to CDFW (Moyle et al., 2015).
- Animals fully protected in California (California Fish and Game Code Sections 3511 [birds], 4700 [mammals], 5050 [amphibians and reptiles], and 5515 [fish]).

Forty-four special-status plant species have a moderate to high potential to occur in the Project Area based on known occurrences in or within 10 miles or presence of potential suitable habitat. Table 1,

S*pecial-status Plant Species Occurring in or Near the Project Area,* of Appendix A lists the species identified from the sources cited above, their status, distribution, and habitat requirements, and their potential to occur in the boundaries of the Proposed Project. Thirty-two special-status wildlife species have a moderate to high potential to occur in the Project Area based on known occurrences in or within 5 miles or presence of potential suitable habitat. Table 2, S*pecial-status Wildlife Species Occurring in or Near the Project Area*, in Appendix A lists the species identified from the sources cited above, their status, distribution, and habitat requirements, and their potential to occur in the boundaries of the Proposed Project.

Waters of the U.S./Waters of the State

Potential regulated waters of the U.S./State occur throughout the Proposed Project. As discussed in the *Natural Communities* section above, these include freshwater marsh, seasonal wetlands, ponds, creeks, streams, and various other waterways (see Mapbook in Appendix A for more detail). Overall, there are approximately 83.6 acres of potential regulated waters of the U.S./State in the Project Area; however, the proposed investigation areas have been sited specifically so they would not intersect with any of the potential regulated waters of the U.S./State.

Impact Analysis

The Proposed Project's potential impacts on sensitive biological resources are discussed below for each specific resource. Where additional analysis and mitigation is warranted to ensure that potential impacts to sensitive biological resources are avoided and minimized, details are also provided. All biological mitigation measures, MM Bio-1 through MM Bio-17 are provided in Table 9 at the end of this section. If all significant impacts to sensitive biological resources cannot be avoided by implementation of MM Gen-1 and MM Bio-1 through MM Bio-17, the Investigation site will be re-evaluated with implementation of MM Gen-2 (details in Section 2.3 *Project Description*), and potentially removed from the Proposed Project.

a) Special-status Species

***Special-status Plants*:** As noted above, based on the desktop evaluation, up to 44 special-status plant species have been identified to have a moderate to high potential to occur within the Project Area. Therefore, the investigations, as well as overland travel and ground disturbance associated with the investigations have a potential to impact these 44 special-status plant species.

Without mitigation, the proposed investigations could result in an impact, either directly or through habitat modification, on special-status plant species. Implementation of MM Gen-1 will require a botanist to assess the proposed investigation locations and access routes at least one week prior to mobilization. In addition, to ensure that impacts to special-status plants would be further avoided and minimized, the Authority would implement Bio-16. If the proposed investigations still cannot avoid impacts to special-status plants, the Authority would implement MM Gen-2. Therefore, impacts on special-status plants would be less than significant with mitigation incorporated.

Special-status Invertebrates*:*

Valley Elderberry Longhorn Beetle: Based on the desktop evaluation, the proposed investigations are not anticipated to be near or within 165 feet of an elderberry shrub. Further, although some investigations may occur within or in the vicinity of riparian habitat, the activities would not require any vegetation removal.

During the pre-investigation siting surveys (MM Gen-1), a biologist would confirm if elderberry shrubs are present within the investigation areas and access routes. If present, the Proposed Project team

would avoid impacts to elderberry shrubs by adjusting the investigation area to be more than 165 feet away from the shrubs. In addition to MM Gen-1, the Authority would implement MM Bio-1, Bio-2, and Bio-4 to further avoid any potential impacts to valley elderberry longhorn beetle or elderberry shrubs. If investigations cannot be sited more than 165 feet away from an elderberry shrub, the Authority would implement MM Gen-2. Therefore, impacts to the valley elderberry longhorn beetle would be less than significant with mitigation incorporated.

Vernal Pool Branchiopods: Based on the desktop evaluation, the proposed investigations are not anticipated to be near or within 250 feet of vernal pool branchiopod habitat. Therefore, the Proposed Project is not anticipated to result in any direct or indirect impacts on vernal pool branchiopods (vernal pool fairy shrimp, vernal pool tadpole shrimp, and Conservancy fairy shrimp) or their habitat.

If during the pre-investigation siting survey (MM Gen-1), vernal pool branchiopod habitat is identified to be within the proposed investigation locations and access routes, the Authority would implement MM Bio-5, which would not allow investigations to occur within 250 feet of suitable vernal pool branchiopod habitat. Additionally, through the implementation of MM Bio-1, MM Bio-2, and MM Bio-3, impacts on vernal pool branchiopods would be further minimized or avoided. If investigations cannot be sited outside of vernal pool habitat, the Authority would implement MM Gen-2. Therefore, any impacts to vernal pool branchiopods or their habitat would be less than significant with mitigation incorporated.

Pollinators: Based on the desktop evaluation, potential suitable habitat for special-status pollinators, including monarch butterfly, crotch bumble bee, and western bumble bee, is present within the Project Area.

Without mitigation, as work would be implemented in potential habitat for special-status pollinator species, the proposed investigations could result in an impact, either directly or through habitat modifications, on special-status pollinator species. Implementation of MM Gen-1 will require a biologist to verify if host-plant species are within the investigation areas and access routes. If suitable host-plants are present, then the investigation locations would be adjusted so that work would avoid these host plants. In addition, to ensure that impacts to special-status pollinators and their host plants would be further avoided and minimized, the Authority would implement Bio-16. If the proposed investigations still cannot avoid impacts to special-status pollinators and their host plants, the Authority would implement MM Gen-2. Therefore, impacts on special-status pollinators would be less than significant with mitigation incorporated.

Special-status Wildlife:

Special-status Fish: All proposed investigations are sited outside of the bed and banks of nearby aquatic habitat (e.g., streams, channels, creeks). Therefore, the Proposed Project would not result in any impacts to special-status fish species, designated critical habitat for listed species, or essential fish habitat for Pacific salmon (Chinook salmon) and other native species. Additionally, temporary drainage crossings, if necessary, would avoid ditches by moving around or crossing in areas with dry conditions, as possible, or spanned without in-water temporary fill; therefore, proposed temporary drainage crossings would not impact habitats suitable for special-status fish species.

As work and access are not proposed within any bed or banks of aquatic habitat, the proposed investigations would not result in any impact, either directly or through habitat modifications, on special-status fish species. Therefore, there would be no impact on special-status fish or their habitat and no mitigation is required.

Special-status Reptiles: As noted in the *Project Description*, test pits and quarry study trenches would be backfilled and returned to pre-investigation conditions by the end of each workday. Fault study trenches may remain open multiple days, but would be temporarily covered with heavy duty plywood sheets (3/4 inch or thicker sheets) at the end of each workday so that no wildlife could access the trench and potentially get hurt or become trapped. Biological monitors would clear area prior to work proceeding the following day and be present during removal of the plywood sheets.

Giant Garter Snake: Based on the desktop evaluation, the proposed investigations are not anticipated to be near or within 200 feet of suitable upland habitat for giant garter snake (areas within 200 feet of aquatic habitat with suitable refugia, such as small mammal burrows); however, work would be implemented on existing roads. Small mammal burrows underneath the road prism may provide habitat for giant garter snake. No proposed investigations would take place in giant garter snake aquatic habitat.

Without mitigation, as work would be implemented on existing roads, the proposed investigations could result in an impact, either directly or indirectly, on giant garter snake. Implementation of MM Gen-1 will require a biologist to verify if investigation areas and access routes are within 200 feet of suitable upland habitat, as well as determine whether there are burrows present underneath or adjacent to the roadways. If suitable habitat is present, then the investigation locations would be adjusted so that no work would occur within 200 feet of suitable upland habitat and subsurface investigations would avoid any identified burrows. In addition, the Authority would implement MMs Bio-1 through Bio-3 and Bio-6 to minimize and avoid impacts to giant garter snake.

If proposed investigation areas cannot be sited to avoid suitable habitat, MM Gen-2 would be implemented. Therefore, the Proposed Project is not anticipated to result in any impacts on giant garter snake or their habitat. As a result, impacts on giant garter snake would be less than significant with mitigation incorporated.

Western Pond Turtle: Similar to other aquatic species discussed earlier, the proposed investigations have been sited to not occur within or near western pond turtle habitat to the extent possible. In-water investigations are not proposed as part of the Proposed Project. Proposed investigations would not be located in ponds or streams, and most would be located at least 300 feet away from potential aquatic habitat. Additionally, temporary drainage crossings, if necessary, would avoid ditches by moving around or crossing in areas with dry conditions, as possible, or spanned without in-water temporary fill; therefore, proposed temporary drainage crossings would not impact western pond turtle habitat.

However, without mitigation, the proposed investigations could still result in an impact, either directly or through habitat modifications, on the western pond turtle. Implementation of MM Gen-1 will require a biologist to assess the proposed investigation locations at least one week prior to mobilization. In addition, to ensure that impacts to western pond turtle would be further avoided and minimized, implementation of measures intended to protect potential wetlands and waters, giant garter snake and red-legged frogs (MMs Bio-1 through Bio-3, Bio-6, and Bio-7)) would also provide protection for the western pond turtle. If the proposed investigations still cannot avoid impacts to western pond turtle, the Authority would implement MM Gen-2. Therefore, impacts on western pond turtle would be less than significant with mitigation incorporated.

Special-status Amphibians: As noted in the *Project Description*, test pits and quarry study trenches would be backfilled and returned to pre-investigation conditions by the end of each workday. Fault study trenches may remain open multiple days, but would be temporarily covered with heavy duty plywood sheets (3/4 inch or thicker sheets) at the end of each workday so that no wildlife could access

the trench and potentially be hurt or become trapped. Biological monitors would clear area prior to work proceeding the following day and be present during removal of the plywood sheets.

California Red-legged Frog: Based on the desktop evaluation, the proposed investigations are not anticipated to take place in California red-legged frog aquatic habitat. Several proposed investigations near Funks Creek, Stone Corral Creek, Antelope Creek, and several unnamed intermittent streams would encroach upon potential upland habitat for California red-legged frog (areas within 300 feet of aquatic habitat). However, the proposed investigations in these areas would not result in any substantial ground-disturbing activities.

Without mitigation, California red-legged frogs present in the area during work activities could be injured or killed. California red-legged frogs occurring near the work areas could also be disturbed by the loud noise and vibrations associated with the work, which could disrupt normal behaviors and increase energy expenditures.

Proposed investigations would also take place in grassland and woodland areas that are considered to be potential California red-legged frog dispersal habitat (areas within 1 mile of potential aquatic habitat), but these areas would only be considered dispersal habitat during wet weather in the fall and winter. If the proposed investigations occur during wet weather in the fall or winter and California red-legged frogs are dispersing through the area, the movement of work vehicles and equipment, and other activities could result in injury or mortality of California red-legged frogs. Therefore, without mitigation, the Proposed Project activities could result in the temporary disturbance of California red-legged frogs in potential dispersal habitat.

Thus, without mitigation, the proposed investigations could result in an impact, either directly or through habitat modifications, on California red-legged frog. Implementation of MM Gen-1 will require a biologist to assess the proposed investigation locations to determine if the proposed work areas are within or near California red-legged frog habitat. Additionally, implementation of MM Bio-1 through MM Bio-3 and MM Bio-7 would further minimize impacts on California red-legged frogs. If direct impacts to California red-legged frog and its habitat cannot be avoided, the Authority would implement MM Gen-2. Therefore, impacts on California red-legged frogs would be less than significant with mitigation incorporated.

Western Spadefoot Toad: Based on a desktop evaluation, proposed investigations would not take place in western spadefoot toad aquatic habitat, but activities would take place in potential upland habitat and during times when both juveniles and adults may be dispersing across the landscape or when seeking refuge in subsurface retreats, such as burrows and soil cracks.

In addition, the movement of work vehicles and equipment, and other activities could result in injury or mortality of western spadefoot toad because the proposed investigations would take place in suitable upland habitat for the species. Therefore, without mitigation, the Proposed Project activities could result in the temporary disturbance of potential upland habitat.

Without mitigation, the proposed investigations could result in an impact, either directly or through habitat modifications, on western spadefoot toad. Implementation of MM Gen-1 will require a biologist to assess the proposed investigation locations at least one week prior to mobilization. In addition, to ensure that impacts to western spadefoot toad would be further avoided and minimized, implementation of measures intended to protect potential wetlands and waters, and yellow- and red-legged frogs (MMs Bio-1 through Bio-3, Bio-7, and Bio-8) would also provide protection for the western spadefoot toad. If the proposed investigations still cannot avoid impacts to western

spadefoot toad, the Authority would implement MM Gen-2. Therefore, impacts on western spadefoot toad would be less than significant with mitigation incorporated.

Foothill Yellow-legged Frog: Based on the desktop evaluation completed for the Proposed Project, the proposed investigations have been sited to avoid work within 300 feet of any potential foothill yellow-legged frog habitat (i.e., intermittent or perennial streams with moderate gradient and rocky substrates). Several investigation work areas would be sited near the top of the bank of relatively low-gradient segments of streams, including Funks Creek, just west of Funks Reservoir, as well as of Stone Corral Creek, and Antelope Creek. During Proposed Project planning, the beds and banks of these aquatic habitats were also avoided. In addition, Funks Creek is influenced by the water elevations in Funks Reservoir, which would be considered atypical habitat for this species. Given the low-quality habitat in the Project Area, as well as the temporary nature of the proposed work, the likelihood of impacts to foothill yellow-legged frog is limited. Nonetheless, without mitigation, the potential for the proposed investigations to impact foothill yellow-legged frog still remains because field verification has not occurred.

Thus, without mitigation, the proposed investigations could result in an impact, either directly or through habitat modifications, on foothill yellow-legged frog. Implementation of MM Gen-1 will require a biologist to assess the proposed Investigation locations at least one week prior to mobilization. In addition, to ensure that impacts to foothill yellow-legged frog would be further avoided and minimized, the Authority would implement MMs Bio-1 through Bio-3 and Bio-8. If the proposed investigations still cannot avoid impacts to foothill yellow-legged frog, the Authority would implement MM Gen-2. Therefore, impacts on foothill yellow-legged frog would be less than significant with mitigation incorporated.

Special-status Bird Species: As noted in the *Project Description*, test pits and quarry study trenches would be backfilled and returned to pre-investigation conditions by the end of each workday. Fault study trenches may remain open multiple days, but would be temporarily covered with heavy duty plywood sheets (3/4 inch or thicker sheets) at the end of each workday so that no wildlife could access the trench and potentially be hurt or become trapped. Biological monitors would clear area prior to work proceeding the following day and be present during removal of the plywood sheets.

Swainson's Hawk: Based on a desktop evaluation, the entirety of the Project Area is identified as suitable Swainson's hawk habitat; therefore, without mitigation, the proposed investigations could result in the disruption of nesting and foraging activities, if the species is present within or near the work areas. These impacts would result from noise and physical disturbance associated with the drill rigs, and vehicles that would be conducted at the Investigation areas. Tree removal would not occur under the Proposed Project.

Thus, without mitigation, the proposed investigations could result in an impact, either directly or indirectly, on Swainson's hawk. Implementation of MM Gen-1 will require a biologist to assess the proposed investigation locations at least one week prior to mobilization. In addition, to ensure that impacts to Swainson's hawk would be further avoided and minimized, the Authority would implement MMs Bio-9 and Bio-11. MM Bio-9 consists of general nesting bird surveys and MM Bio-11 includes species-specific pre-activity surveys, avoidance buffers, and timing restrictions that would result in no take of Swainson's hawk. If the proposed investigations still cannot avoid impacts to Swainson's hawk with implementation of MM Bio-9 and MM Bio-11, the Authority would implement MM Gen-2. Therefore, impacts on Swainson's hawk would be less than significant with mitigation incorporated.

Western Burrowing Owl: Similar to the evaluation completed for Swainson's hawk, the desktop evaluation determined that grasslands and agricultural areas within the Project Area are potentially suitable western burrowing owl habitat. Without mitigation, the proposed investigations could result in the disruption of western burrowing owl activities, if the species is present within or near the work areas. These impacts would result from noise and physical disturbance associated with the drill rigs and vehicles that would be present.

Thus, without mitigation, the proposed investigations could result in an impact, either directly or through habitat modification, on western burrowing owl. Implementation of MM Gen-1 will require a biologist to assess the proposed Investigation locations at least one week prior to mobilization. In addition, to ensure that impacts to western burrowing owl would be further avoided and minimized, the Authority would implement MM Bio-12, which requires pre-activity surveys, the establishment of avoidance buffers around occupied habitat, relocation of work areas, and biological monitoring. If the proposed investigations still cannot avoid impacts to western burrowing owl, the Authority would implement MM Gen-2. Therefore, impacts on western burrowing owl would be less than significant with mitigation incorporated.

Bald Eagle, Golden Eagle, and Other Special-status and Nesting Birds: The desktop evaluation determined that the Project Area is identified as suitable habitat for bald and golden eagles and other special-status and nesting bird species, including but not limited to northern harrier, white-tailed kite, mountain plover, yellow-breasted chat, yellow warbler, song sparrow, tricolored blackbird and bank swallows. Without mitigation, the proposed investigations could result in the disruption of nesting and foraging activities of special-status and migratory birds, as well as nesting of other species of birds not covered by the MBTA. These impacts would result from noise and physical disturbance associated with the drilling rigs, vehicles, and subsurface activities that would be conducted at the Investigation areas.

Thus, without mitigation, the proposed investigations could result in an impact, either directly or through habitat modification, on special-status and other nesting birds. Implementation of MM Gen-1 will require a biologist to assess the proposed investigation locations at least one week prior to mobilization. In addition, to ensure that impacts to bald eagles, golden eagles, and other special-status and nesting birds would be further avoided and minimized, the Authority would implement MMs Bio-9 through Bio-11, Bio-13, and Bio-14. These measures include a general nesting bird survey and species-specific pre-activity surveys, avoidance buffers, and timing restrictions, and would require that there is no take of protected birds and that other impacts are avoided. If the proposed investigations still cannot avoid permanent impacts to bald eagle, golden eagle, and other special-status and migratory birds, as well as other nesting birds not covered by the MBTA, the Authority would implement MM Gen-2. Therefore, impacts on bald eagles, golden eagles, and other special-status and nesting birds would be less than significant with mitigation incorporated.

Special-status Mammal Species: As noted in Section 2.3 *Project Description*, test pits and quarry study trenches would be backfilled and returned to pre-investigation conditions by the end of each workday. Fault study trenches may remain open multiple days, but would be temporarily covered with heavy duty plywood sheets (3/4 inch or thicker sheets) at the end of each workday so that no wildlife could access the trench and potentially be hurt or become trapped. Biological monitors would clear area prior to work proceeding the following day and be present during removal of the plywood sheets.

Special-status Bats: The Project Area was reviewed, via a desktop evaluation, to determine if potential roosting habitat for special-status bats is present in the vicinity of the proposed investigation locations. Specifically, many of the large trees and snags in the oak woodland habitat

throughout the Project Area could provide suitable habitat for bats in the form of cavities or loose bark. No structures or trees would be removed and tree trimming is not part of the Proposed Project. However, noise associated with the proposed activities including operating drilling rigs, and vehicles could temporarily disturb roosting bats, if present in the vicinity of the investigation locations. Additionally, an overall increase in human activity could disturb breeding bats. Direct mortality or disturbance to breeding bats would be considered a significant impact.

Thus, without mitigation, the proposed investigations could result in impacts, either directly or indirectly, on special-status bats. Implementation of MM Gen-1 will require a biologist to assess the proposed investigation locations at least one week prior to mobilization. In addition, to ensure that impacts to special-status bats would be further avoided and minimized, the Authority would implement MM Bio-1, Bio-2, and Bio-17. These mitigation measures require a worker environmental awareness training, general measures to avoid and minimize impacts on sensitive resources, including bats, as well as bat specific surveys and avoidance. If the proposed investigations still cannot avoid impacts to special-status bats, the Authority would implement MM Gen-2. Therefore, impacts on special-status bats would be less than significant with mitigation incorporated.

American Badger: Based on the desktop evaluation, potential habitat for American badger is present within the Project Area; therefore, without mitigation, the proposed investigations could affect American badger and its habitat. Because the American Badger is a burrowing animal, impacts would be similar to those identified for western burrowing owl and would include noise and physical disturbance associated with the site preparation, equipment use and operation, and subsurface investigations in or near suitable grassland habitat for the species. Other activities that could temporarily disrupt normal behaviors of the species, such as foraging, dispersal, and breeding include potential visual disturbances.

Thus, without mitigation, the proposed investigations could result in impacts, either directly or through habitat modification, on American badger. Implementation of MM Gen-1 will require a biologist to assess the proposed investigation locations at least one week prior to mobilization. In addition, to ensure that impacts to American badger would be further avoided and minimized, the Authority would implement MM Bio-1, Bio-2, and Bio-15. The American-badger specific measure (MM Bio-15) would ensure that no investigations occur within 50 feet of an active American badger den, as well as requiring a biological monitor to be present during all work activities within 50 to 100 feet of an active den. If the proposed investigations still cannot avoid impacts to American badger, the Authority would implement MM Gen-2. Therefore, impacts on American badger would be less than significant with mitigation incorporated.

b) Riparian Habitat and Other Sensitive Natural Communities

Proposed investigations test pits and fault and quarry study trench excavations would avoid impacts to riparian habitat. These activities also do not occur within any tree canopy associated with riparian habitat or oak woodland. However, activities associated with the proposed investigations, such as overland travel (access) and other activities that would occur in the broader work areas, have a potential to impact open areas identified as woodland habitat, as the desktop evaluation shows activities occurring within or adjacent to this type of habitat. The only other natural terrestrial community identified by the desktop evaluation that could be affected would be annual grassland; however, this natural community is not considered sensitive by CDFW or USFWS.

Thus, without mitigation, the proposed investigations could result in an impact, either directly or through habitat modifications, on woodland habitat, a sensitive natural community protected by local or regional plans, policies, regulations, and/or by CDFW or USFWS. However, the proposed investigations

would not result in the permanent loss of woodland habitat. Implementation of MM Gen-1 will require a biologist to assess the proposed investigation locations at least one week prior to mobilization. In addition, to ensure that impacts to riparian and woodland habitat would be further avoided, the Authority would implement MMs Bio-1 and Bio-2. Mitigation measure Bio-2 specifically requires investigation activities to occur outside of tree canopies and that the upper 12 inches of topsoil are returned to pre-project conditions. If the proposed investigations still cannot avoid impacts to sensitive natural communities, the Authority would implement MM Gen-2. Therefore, impacts on riparian and woodland habitat would be less than significant with mitigation incorporated.

c) State or Federally Protected Wetlands

No ground-disturbing activities or placement of fill associated with the Proposed Project would take place within potentially regulated state or federal protected wetlands or waters. Temporary indirect impacts could include soil disturbance from construction vehicle access and equipment staging if it occurred within 250 feet of state or federally protected wetlands or waters resulting in increased erosion and sedimentation that could be discharged. Removal of groundcover in nearby investigation areas could also increase stormwater runoff. Additionally, temporary drainage crossings, if necessary, would avoid ditches by moving around or crossing in areas with dry conditions, as possible, or spanned without in-water temporary fill; therefore, proposed temporary drainage crossings would not impact state or federal protected wetlands or waters.

Further, activities could impair water quality should accidental spills or discharges of hazardous materials or contaminants enter nearby potentially regulated wetland features. Standard Protocols and Procedures (Appendix B) would be incorporated into the Proposed Project for SWPPP and BMPs and spill prevention and hazardous materials management.

In addition to MM Gen-1, the Authority would implement MMs Bio-1 through Bio-3 to further reduce the risk of indirect impacts on potentially jurisdictional wetlands and non-wetland waters of the U.S./State in and adjacent to the Project Area. If implementation of the mitigation measures does not result in avoidance of impacts, MM Gen-2 would be implemented so that the site is removed from the current schedule and re-evaluated or removed from the Proposed Project. Therefore, impacts on wetlands would be less than significant with mitigation incorporated.

d) Migratory Wildlife Species, Corridors, and Nursery Sites

The Proposed Project investigations would not interfere 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. No native wildlife nursey sites are known to occur in the Project Area. Further, no work within aquatic resources would occur.

As a result, based on desktop analysis, it is not anticipated that the Proposed Project would impact the movement of special-status and native fish. MM Gen-1 would be implemented to ground truth the desktop analysis; this measure requires a biologist to confirm that native resident or migratory wildlife corridors are not present within or conflict with the proposed investigation areas. Additionally, because of the short-term nature of these activities, and considering the baseline conditions at adjacent agricultural areas, which includes both the presence of farm workers and the periodic operation of farm equipment, the impact on native resident or migratory wildlife species, corridors, and nursery sites would be less than significant.

e) Biological Ordinances and Policies

The desktop evaluation identified several local policies that protect biological resources, including the *Colusa County 2030 General Plan* (Colusa County 2011), *Glenn County General Plan Update Existing Conditions Report* (Glenn County 2020), and *Yolo County 2030 Countywide General Plan* (Yolo County 2009). Biological resources protected by these counties include vegetation and wetland resources such as special-status plant and wildlife species, riparian habitat, oak woodlands, wetlands, and streams. The *Yolo County 2030 Countywide General Plan* also protects large valley oaks (although there are none in the Project Area in Yolo County) and promotes removal of invasive plant species. Though special-status plants and wildlife species, riparian habitat, oak woodlands, and streams do occur within the Project Area, the proposed investigations would not result in substantial impacts to these resources (as described earlier under each resource). Tree removal, work within the tree canopy, in-water work, or work within the beds and banks of aquatic resources (e.g., creeks, streams, channels) is not proposed.

The Proposed Project is not anticipated to conflict with any local policies or ordinances protecting biological resources. Further, the Proposed Project does not include new construction or land uses that would have the potential to substantially affect biological resources. To confirm the investigation sites selected by desktop analysis do not induce conflicts, implementation of MM Gen-1 would confirm avoidance of impacts to biological resources. Additionally, implementation of MM Bio-1 through MM Bio-17, would further minimize or avoid the potential for impacts to biological resources. If the proposed investigations still cannot avoid impacts to these sensitive natural communities, the Authority would implement MM Gen-2. Therefore, impacts on local policies and ordinances would be less than significant with mitigation incorporated.

f) HCPs and NCCPs

The desktop evaluation identified that the Yolo County HCP/NCCP (Yolo Habitat Conservancy 2018) and the Yolo Bypass Wildlife Area Land Management Plan (California Department of Fish and Game 2008) are the only conservation plans that encompass the Project Area. The single proposed test pit near the Dunnigan Pipeline portion of the Project Area is the only proposed investigation located in Yolo County. No proposed investigations would occur in the Yolo Bypass Wildlife Area. Additionally, the proposed investigations are not covered under the Yolo County HCP/NCCP, therefore, the Yolo County HCP/NCCP does not apply. Therefore, there would be no impact on the provisions of an adopted HCP, NCCP, or other approval local, regional, or state HCP. No mitigation is required.

Table 9. Mitigation Measures for Biological Resources

Mitigation Measure Title	Description
MM Bio-1: Conduct Mandatory Biological Resources Awareness Training	Prior to Proposed Project implementation, a qualified biologist will conduct a mandatory biological resources awareness training for all Proposed Project personnel. A qualified biologist is defined as someone with training, knowledge, and experience with the species this document is concerned with. The training will cover special-status species and their habitats that could be encountered in the Project Area. The training will cover the natural history, appearance (using representative photographs), and legal status of species, regulatory protections, penalties for noncompliance, benefits of compliance, as well as the avoidance and minimization measures to be implemented. Participants will be required to sign a form that states they have received and understand the training. The Authority will maintain the record of training and make it available to USFWS and CDFW upon request. The Authority-provided biological monitor will verify that the new personnel brought onto the Proposed Project team receive the mandatory training before starting work.
MM Bio-2: General Measures to Avoid and Minimize Effects on Sensitive Biological Resources	General restrictions and guidelines that will be followed by personnel are listed below. The contractor and Authority-provided biological monitor will be responsible for ensuring that crew members adhere to these measures: • Qualified biologists will monitor all terrestrial activities. Any observations of federally listed species will be reported to the Authority and USFWS within 24 hours. Any observations of state listed species will be reported to Authority and CDFW within 24 hours. • Personnel driving vehicles will observe the posted speed limit on paved roads and a 15 mile-per-hour speed limit on unpaved roads, during off-road travel in or adjacent to habitat, and in any areas closed to normal traffic to reduce the risk of vehicle strikes to biological resources during travel in the Project Area. • All project personnel will have stop work authority if a potentially listed species is observed within an active work area. • All food-related trash will be disposed of in closed containers and removed from the work area daily during the work period. Personnel will not feed or otherwise attract fish or wildlife to the work site. • No pets or firearms will be allowed in the Project Area. • All Proposed Project -related equipment will be maintained to prevent leaks of fuels, lubricants, or other fluids. Daily equipment inspections will include inspections for leaks. • Temporary signs, staking, or flagging will be used to identify sensitive biological resources and project personnel will be directed to avoid disturbance of these areas. These areas will be identified during pre-activity surveys. Signs, staking, and flagging will be inspected by the qualified biologist on a daily basis. • Any worker who inadvertently injures or kills a special-status species or finds one dead, injured, or entrapped will immediately report the incident to the Authority-provided biological monitor, who will immediately report the incident to the Authority. The Authority will provide oral notification to the USFWS Sacramento Endangered Species Office within 1 working day. The Authority will follow up with written notification to USFWS within 5 working days.

Mitigation Measure Title	Description
	• Vehicles and equipment left onsite overnight will be thoroughly inspected each day for wildlife (both underneath the vehicle and in open cabs) before they are moved. To prevent possible resource damage from hazardous materials such as motor oil or gasoline, personnel will not service or refuel vehicles, equipment, or motorized tools within 300 feet of any aquatic habitat. • Work will be restricted to open areas in riparian habitat and other sensitive natural communities, including woodlands. All work will remain outside of the tree canopy. Additionally, the upper 12 inches of topsoil will be restored at drilled work area within these habitats.
MM Bio- 3: Potentially Regulated Wetlands and Waters of the U.S./State	The following measures will be implemented to avoid, minimize, and mitigate impacts on wetlands and waters subject to federal and State jurisdiction: • At least 48 hours prior to any ground-disturbing activities, a qualified biologist will ground truth the land cover mapping within proposed Investigation areas and staging areas, including areas within 250 feet where accessible (i.e., where access has been granted by the property owner), to confirm the presence and absence of wetlands and waters. All wetlands and waters not previously identified will be mapped in the field using a global positioning system (GPS) with submeter accuracy and will be used to update the land cover mapping. • To the extent practicable, investigations will not take place within 250 feet of wetlands and waters (i.e., ponds, streams, reservoirs) and for activities identified in the Proposed Project description that are near or adjacent to canals and ditches in the agricultural areas. • If work needs to occur within 250 feet of wetlands and waters that are not already restricted by mitigation for special-status wildlife species (see MM Bio-4, 5, and 6), the following measures will be implemented: o Sediment control measures: Prevent transport of sediment from work area; Reduce runoff velocity on exposed slopes; and Reduce offsite sediment tracking. o Management measures for Investigation materials: Cover and berm loose stockpiled materials; Store chemicals in watertight containers; and Minimize exposure of work materials to stormwater. o Designate refueling and equipment inspection/maintenance locations at least 300 feet from aquatic habitats. A spill prevention plan will be implemented. o A biological monitor will be onsite during all work within 250 feet of waters and wetlands. o In coordination with the Authority provided biological monitor, disturbed areas will be returned to their original condition, which may include the following: Restoring original topography to the degree possible; Placement of erosion control BMPs (e.g., wattles, soil binders, straw mulch, geotextiles) may be used to help stabilize work areas once work is complete; and Hydroseeding with noninvasive plant seed.
MM Bio-4: Valley Elderberry Longhorn Beetle	The following measures will be implemented to avoid, minimize, and mitigate impacts on valley elderberry longhorn beetle throughout the Proposed Project: • Pre-activity surveys for elderberry shrubs will be conducted in and adjacent to potential work areas by a qualified biologist familiar with the appearance of valley elderberry longhorn beetle exit holes in elderberry shrubs. Pre-activity surveys will be conducted in

Mitigation Measure Title	Description
	accordance with the USFWS's 2017 *Framework for Assessing Impacts to the Valley Elderberry* Longhorn *Beetle (Desmocerus californicus dimorphus)*. Any elderberry shrubs in the Project Area will be mapped. Those shrubs that are within 300 feet of Proposed Project activities will be identified with flagging and protected with high-visibility fencing (at the edge of the work area) and signs indicating the potential for beetle presence and excluding any Proposed Project activity within 165 feet of the plants. • A qualified biologist will be responsible for ensuring the buffer area fences are maintained throughout implementation of the Proposed Project. • Gravel roadways, staging areas, and other applicable areas will be sprayed with water as needed to minimize dust moving onto elderberry shrubs.
MM Bio-5: Vernal Pool Branchiopods	The following measures will be implemented to avoid, minimize, and mitigate impacts on federally listed vernal pool branchiopods: • Prior to any ground-disturbing activities, a qualified biologist will ground truth the land cover mapping within the above identified Investigation areas and staging areas, including areas within 250 feet, to confirm the presence or absence of habitat suitable for vernal pool branchiopods. All suitable branchiopod habitat will be mapped in the field using a GPS with submeter accuracy and will be used to update the land cover mapping. Updated maps with exclusion buffers for listed species will be provided to all Proposed Project personnel. • Vehicles and equipment will not travel in identified branchiopod habitat. • Investigations will fully avoid impacts on vernal pool branchiopods and their habitat. Full avoidance requires a minimum 250-foot no-disturbance buffer around all suitable habitat potentially supporting vernal pool branchiopods or drainage features feeding or draining these areas. The buffers will be identified with flagging or high visibility fencing as well as signs identifying it as off limits and protected habitat. • Investigations will not take place within 250 feet of suitable vernal pool branchiopod habitat. • The Authority-provided qualified biologist will ensure that the contractor complies with these avoidance buffers.
MM Bio-6: Giant Garter Snake	No work would occur within aquatic habitat for giant garter snake. However, the following measures will be implemented to avoid, minimize, and mitigate impacts on the giant garter snake and its upland habitat should it be identified during ground truthing of the Proposed Project work areas: • Prior to any ground-disturbing activities, a qualified biologist will ground truth the land cover mapping done for the Proposed Project within the above identified investigation areas and staging areas, to confirm the absence of habitat suitable for giant garter snake. In addition, an inspection of all areas within a minimum of 50 feet around the proposed work sites for burrow entrances or other signs of underground refugia will be conducted. As possible, areas near any identified potential refugia within the work area and within the 50-foot buffer will be avoided. All suitable habitat will be mapped in the field using a GPS with submeter accuracy and will be used to update the land cover mapping. Updated maps with exclusion buffers for listed species will be provided to all Proposed Project personnel. • Investigations will not be conducted in giant garter snake upland habitat during the active giant garter snake season (April through October) to the maximum extent practicable.

Mitigation Measure Title	Description
	• No less than 30 days prior to Proposed Project implementation, the Authority will submit a request for approval of biologists to conduct monitoring and other activities (see below) associated with the giant garter snake in the areas identified above. • A qualified biologist will survey work areas within 200 feet of giant garter snake aquatic habitat for snakes no more than 24 hours prior to the start of activities. • Movement of heavy equipment will be confined to existing paved and dirt roads and will avoid suitable upland giant garter snake habitat. • A qualified biologist will be present during all investigation activities taking place within 200 feet of suitable aquatic habitat if identified in the Proposed Project. The biologist will visually check for giant garter snake under vehicles and equipment prior to contractors moving them. The biologist will ensure that the contractor caps all materials onsite (e.g., conduits, pipe), precluding wildlife from becoming entrapped. The biologist will check any crevices or cavities in the work area where individuals may be present including stockpiles that have been left for more than 24 hours where cracks/crevices may have formed. • If a giant garter snake is observed by the biologist within the work area, all work will cease until the snake has moved out of the work area on its own, and no capture or relocation will be allowed. The observation will be recorded and reported to the USFWS and CDFW within one business day.
MM Bio-7: California Red-legged frog	No work would occur within suitable California red-legged frog aquatic habitat. If work needs to be conducted within suitable California red-legged frog upland habitat or dispersal habitat (areas within 1 mile of aquatic breeding habitat during the rainy season, generally October 15 to March 31), the following measures will be implemented to avoid, minimize, and mitigate impacts under the guidance of a qualified biologist: • Prior to any ground-disturbing activities, a qualified biologist will ground truth the land cover mapping that was done for the Proposed Project within the above identified investigation areas and staging areas to confirm the presence or absence of habitat suitable for California red-legged frog. All suitable habitat will be mapped in the field using a GPS with submeter accuracy and will be used to update the land cover mapping. Updated maps with exclusion buffers for listed species will be provided to all Proposed Project personnel. • A qualified biologist will be present during all investigation activities in California red-legged frog upland habitat and dispersal habitat (if work occurs during rainy season, generally October 15 to March 31 when frogs are dispersing) to implement avoidance and minimize measures for the California red-legged frog. The biologist will survey work areas for frogs and for rodent burrows in potential upland habitat before equipment is moved in and work begins. Areas with higher potential for California red-legged frog, such as areas with a high density of burrows, will be flagged for avoidance. The biologist will work with the Proposed Project staff to align work such that burrows are not affected. • The qualified biologist will inspect all equipment left in a work area overnight to ensure that no frogs are present before work begins. Any California red-legged frogs found within a work area will be avoided and allowed to disperse on their own accord.

Mitigation Measure Title	Description
	• No work will occur in the aforementioned work areas during or 24 hours following a rain event. Following a rain event, no work will proceed until a qualified biologist has inspected the work areas and verified that there are no California red-legged frogs present. A rain event is to be considered precipitation of at least one-quarter inch within a 24-hour period. • Activities within suitable upland/dispersal habitat will occur during daylight hours (from 30 minutes before sunrise to 30 minutes after sunset). Except when necessary for driver or pedestrian safety during egress, artificial lighting at a worksite will be prohibited during the hours of darkness when working in suitable California red-legged frog upland/dispersal habitat. • If work in suitable California-red legged frog dispersal habitat occurs during the rainy season, generally October 15 to March 31, and lasts for more than 1 day, exclusion fencing will be installed around the work area. Fencing will remain within the Project Area at any location and allow enough room for the movement of equipment and personnel. 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 California-red legged frogs.
MM Bio-8: Foothill Yellow-legged Frog	All investigations will be sited outside of foothill yellow-legged frog habitat (i.e., intermittent or perennial streams with moderate gradient and rocky substrates). If work occurs within 300 feet of suitable aquatic habitat, a qualified biological monitor will conduct a pre-activity survey immediately prior to work crews entering the work area and will remain onsite for the duration of the activities within 300 feet of suitable aquatic habitat. If a frog is observed in a work area, it will be allowed to move out of the work area on its own. Any observed foothill yellow-legged frogs will be reported to CDFW within 24 hours.
MM Bio-9: Nesting Birds	The following measures will be implemented to avoid and minimize impacts on nesting birds, including special-status birds, as well as species not specifically protected by the Migratory Bird Treaty Act, during investigations: • A qualified wildlife biologist with experience with nesting birds will conduct nesting surveys before the start of investigation activities during the breeding season (February 1-August 31). A minimum of two separate surveys will be conducted within 14 days prior to the initiation of work, with the last survey within 24 hours prior to work beginning in a given work area. Surveys will include a search of all suitable nesting habitat in the work area. In addition, where accessible, a 0.25-mile radius around the work area will be surveyed for nesting raptors and a 500-foot radius around the work area will be surveyed for other nesting birds. If no active nests are detected during these surveys, no additional measures are required. • If active nests are found in the survey area, no-disturbance buffers will be established around the nest sites to avoid disturbance or destruction of the nest site until the end of the breeding season (approximately August 31) or until a qualified wildlife biologist determines that the young have fledged and moved out of the Project Area (this date varies by species). A qualified wildlife biologist with appropriate nesting bird experience will monitor activities in the vicinity of the nests to ensure that activities do not affect nest success. The extent of the buffers will be determined by the biologists in consultation with CDFW and will depend on the level of noise or disturbance, line-of-sight between the nest and the disturbance, ambient levels of noise and other disturbances, and other topographical or artificial barriers. Suitable buffer distances may vary between species.
MM Bio-10: Bald and Golden Eagles	The following measures will be implemented to avoid, minimize, and mitigate impacts on bald and golden eagles during investigations:

Mitigation Measure Title	Description
	• A qualified wildlife biologist with appropriate bald and golden eagle experience will conduct nesting surveys before the start of investigation activities during the breeding season (January 1-August 31). A minimum of two separate surveys will be conducted within 14 days prior to the initiation of work, with the last survey within 24 hours prior to work beginning in a given work area. • Surveys will include a search of all suitable nesting habitat in the work area. In addition, where accessible, a 1-mile radius around the work area will be surveyed for nesting bald and golden eagles. • All investigations (surface and subsurface) will be avoided within 0.5 mile of potential bald eagle nests; and 1 mile of potential golden eagle nests during the nesting season (January 1-August 31).
MM Bio-11: Swainson's Hawk	The following measures will be implemented to avoid, minimize, and mitigate impacts on Swainson's hawk during investigations: • Pre-activity surveys will be conducted by a biologist with experience with Swainson's hawk to identify the presence of potential Swainson's hawk nest trees on and within 0.25 mile of work and staging areas. Surveys will be consistent with the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (Swainson's Hawk Technical Advisory Committee 2000), or as the methodology is modified based on Proposed Project timing. Survey results will be provided to CDFW by phone or e-mail no less than 5 days prior to commencement of activities, and in a written report within 30 days after commencement of activities. The report will include the location of any known nest trees (occupied within one or more of the last 5 years) present within 0.25 mile of the work footprint. • Investigations will fully avoid Swainson's hawk nests. Investigations will not be conducted within 0.25 mile of an occupied Swainson's hawk nest, except in cases where the Project biologist has determined that case-specific circumstances warrant a smaller buffer. A nest is considered occupied from the time the nest is being constructed until the young leave the nest, or until the nesting attempt fails and the nest is abandoned.
MM Bio-12: Western Burrowing Owl	The following measures will be implemented to avoid, minimize, and mitigate impacts on western burrowing owl during investigations. These measures incorporate survey, avoidance, and minimization guidelines adapted from CDFW's *Staff Report on Burrowing Owl Mitigation* (CDFG 2012). • Pre-activity surveys will be conducted with one occurring 14 days prior to all activities, including staging, and another within 24 hours of these activities within and adjacent to areas of suitable habitat. A qualified biologist will survey the Project Area and record and map all burrowing owl observations and burrows that may be occupied (as indicated by tracks, feathers, egg shell fragments, pellets, prey remains, cast pellets, whitewash, or decoration) on the Project Area. The surveys will be conducted while walking transects throughout the proposed investigations areas, plus all accessible areas within a 200-meter (656 foot) radius of the proposed investigation areas. Surveys will be conducted between 10:00 a.m. and 2 hours before sunset. • Burrowing owls will be avoided by relocating work areas. If an active burrow is identified near a work area and work cannot be conducted outside of the nesting season (February 1 to August 31), a qualified biologist will establish a no-activity buffer that extends a minimum of 656 feet around the burrow except in cases where a qualified biologist has determined that case-specific circumstances warrant a smaller buffer. If burrowing owls are present at the site during the nonbreeding season (September 1 through January 31), a qualified biologist will establish a no-activity zone that extends a minimum of 150 feet around the burrow.

Mitigation Measure Title	Description
	• If the appropriate no-activity buffer for breeding or nonbreeding burrowing owls cannot be established, a wildlife biologist experienced in burrowing owl behavior will evaluate site-specific conditions and recommend a smaller buffer that still minimizes the potential to disturb the owls (and still allows reproductive success during the breeding season). The site-specific buffer will be established by taking into consideration 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 to existing conditions, and the dissimilarity of the proposed activity to background activities. • A biological monitor will be present during all activities occurring within any reduced buffers. If during the breeding season there is any change in owl nesting and foraging behavior as a result of activities, the biological monitor will work with personnel and Authority to provide additional protections to reduce disturbance, such as adding visual and sound curtains. • If monitoring indicates that the nest is abandoned prior to the end of nesting season and the burrow is no longer in use~~d~~ by owls, the no-activity buffer may be removed.
MM Bio-13: Tricolored Blackbird	The following measures will be implemented to avoid, minimize, and mitigate impacts on tricolored blackbird during investigations: • Prior to initiation of investigations within 1,300 feet of suitable nesting habitat, a biologist with experience surveying for and observing tricolored blackbird will conduct pre-activity surveys to establish use of nesting habitat by tricolored blackbird colonies. Surveys will be conducted, where access allows, during the nesting season (generally March 15 to July 31). Three surveys will be conducted within 15 days prior to activities with one of the surveys within 5 days prior to the start of activities. If active tricolored blackbird nesting colonies are identified, the following avoidance measure will be implemented: o Investigations will fully avoid tricolored blackbird nesting and roosting habitat. o To the extent practicable, investigations will not occur within 1,300 feet of an active tricolored blackbird nesting colony (generally March 15 through July 31). Where a buffer distance of 1,300 feet is not practicable, CDFW will be consulted to develop a smaller buffer. The buffer may be reduced in areas with dense trees, buildings, or other habitat features between the activities and the active nest colony, or where there is sufficient topographic relief to protect the colony from excessive noise or visual disturbance as determined by the biological monitor that is experienced with tricolored blackbird. If tricolored blackbirds colonize habitat adjacent to work areas after activities have been initiated, the contractor will reduce disturbance through establishment of buffers and/or sound curtains, as determined by the biological monitor. o Investigations will avoid activities within at least 300 feet from occupied active tricolored blackbird roosting habitat. This minimum buffer may be reduced in areas with dense trees, buildings, or other habitat features between the work activities and the roost, or where there is sufficient topographic relief to protect the roosting site from excessive noise or visual disturbance, or where sound curtains are used, as determined by the biological monitor that is experienced with tricolored blackbird.
MM Bio-14: Bank Swallow	The following measures will be implemented to avoid, minimize, and mitigate impacts on bank swallow during investigations: • If an active colony is found and work must occur during the nesting season (April 1 through August 31), the Authority will establish a no disturbance buffer (determined by the Authority in consultation with CDFW) around the colony during the breeding season.

Mitigation Measure Title	Description
	In addition, a qualified biologist will monitor any active colony within 500 feet of work areas to ensure that activities do not affect nest success.
MM Bio-15: American Badger	The following measures will be implemented to avoid, minimize, and mitigate impacts on American badger during investigations: • A qualified biologist will survey for American badger in work areas, concurrent with the pre-activity survey for burrowing owl. If an active den is located, no investigations will occur within 50 feet of an active American badger den. • A biological monitor will be present during all work within 50 to 100 feet of an active American badger den. The monitor will ensure that activities do not affect the den or substantially disrupt the badger's ability to move freely in and out its den.
MM Bio-16: Special-status Plant Species and Host Plants for Special-status Pollinators	The following measures will be implemented to avoid, minimize, and mitigate impacts on special-status plant species during investigations: • Pre-activity surveys will be conducted for special-status plant species in all investigation and equipment staging areas, as well as areas within 250 feet of Investigation and equipment staging areas. The purpose of these surveys will be to verify that the locations of special-status plants identified in previous record searches or surveys are extant, identify any new special-status plant occurrences, and cover any portions of the Project Area not previously surveyed. During pre-activity surveys, the biologist would also identify any host plants suitable for special-status pollinators (e.g., milkweed, dusty maidens, lupines, medics, phacelias, sages, clarkias, poppies, and wild buckwheats). • All surveys will be conducted by qualified biologists using the using *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFW 2018). To the extent feasible, surveys will be conducted during the blooming season, when special-status plant and pollinator host plant species would be most evident and identifiable. Locations of special- status and pollinator host plants in the Project Area will be recorded using a GPS unit and flagged. • Where surveys determine that a special-status or pollinator host plant species is present in or adjacent to a proposed investigation area, direct and indirect impacts of the Proposed Project on the species will be avoided through the establishment of 250-foot activity exclusion zones surrounding the periphery of occurrences, within which no ground-disturbing activities shall take place. Activity exclusion zones for special-status and pollinator host plant species will be established according to a 250-foot buffer surrounding the periphery of each special-status and host plant species occurrence, the boundaries of which will be clearly marked with standard orange plastic construction exclusion fencing or its equivalent. The establishment of activity exclusion zones will not be required if no activity-related disturbances will occur within 250 feet of the occurrence. The 250-foot buffer may be reduced based on the nature of the activities, the presence of a biological monitor, and/or other site-specific conditions that would allow work to occur closer.
MM Bio-17: Special-status Bat Species	The following measures will be implemented to avoid, minimize, and mitigate impacts on special-status bat species during investigations: • Pre-activity surveys will be conducted for special-status bat species in all work areas, including staging areas. The biologist shall look for bats and bat sign, including existing roost sites and bat guano deposits, and will listen for roosting bats. If potential roost

Mitigation Measure Title	Description
	sites are identified, a project-specific avoidance and minimization plan shall be prepared by a qualified biologist to be reviewed and approved by CDFW prior to the start of Proposed Project investigations. • If vegetation trimming is needed, the biologist will examine the trees to be trimmed to identify suitable bat roosting habitat. Trimming of trees with potentially suitable bat roosting habitat will be avoided during the maternity season (generally between April 1 and July 31) and the hibernation season (generally from November 1 to March 1). • If a maternity roost is found, the roost will be protected until July 31 or until the qualified biologist has determined the maternity roost is no longer active. Appropriate no-work buffers around the roost will be established under direction of the qualified biologist. Buffer distances may vary depending on the species and activities being conducted. The establishment of buffers will be coordinated with CDFW through the preparation of the previously referenced project-specific avoidance and minimization plan.

7.0 Cultural Resources

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	☐	☒	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☒	☐	☐

Environmental Setting

The footprint of the Project Area includes previously identified cultural resources and may include resources that have not yet been identified because of a lack of access to conduct surveys (i.e., some portions of the Project Area include private lands and areas where access has not yet been made available for surveys to identify cultural resources), or because of environmental conditions that obscure the visibility of such resources.

"Cultural resource" is a broad term that includes prehistoric, historic, architectural, and traditional resources. Cultural resources considered in the CEQA guidelines include unique archaeological resources (per California Public Resources Code [PRC] 21083.2) and historical resources (per PRC 21084.1).

According to the CEQA guidelines, historical resources are:

- Listed in, or determined to be eligible for listing in, the California Register of Historical Resources (CRHR) (per PRC 5024.1(e));
- Included in a local register of historical resources (per PRC 5020.1(k)) or identified as significant in a historical resource survey meeting the requirements of PRC 5024.1(g); or
- Determined by a CEQA lead agency to be historically significant.

According to the CEQA guidelines, unique archaeological resources are (per 21083.2(g):

- An archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

    1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information

2. Has a special and particular quality such as being the oldest of its type or the best available example of its type.

3. Is directly associated with a scientifically recognized important prehistoric or historic event or person.

This section considers historical resources and unique archaeological resources, as well as human remains. Cultural resources that may be associated with the prehistoric, ethnographic, or historic context of the Project Area, and may be eligible or potentially eligible for listing in the CRHR, consist of the following types: prehistoric archaeological resources; historic-era archaeological resources; historic-era built environment resources; and multi-component district and landscape resources.

Tribal Cultural Resources are further addressed in Section 20 *Tribal Cultural Resources*.

Background

The Project Area lies at the boundary of the North Coast and Central Valley archaeological regions but is almost entirely within the latter region. The known archaeological record for the Project Area reflects five prehistoric periods for Project Area prehistoric cultural chronology: the Paleo-Indian, Early (or Lower) Archaic, Middle Archaic, Late (or Upper) Archaic, and Emergent periods.

The Project Area is located in an area historically associated with the traditional territories of Patwin, Nomlaki, and Konkow Maidu speaking people.

It is also located in the northern frontier of historic-era Spanish and Mexican colonization efforts in western North America. Spanish colonization (1808 to 1822) followed by a brief period of Mexican governing (1822 to 1848) ended with the advent of the California Gold Rush and the ceding of California to the United States. The American Period (1848 to present) is marked by rapid colonization and the development of transcontinental infrastructure that transformed California from a frontier state to one tied closely to the nation's socioeconomic and political developments.

Known Cultural Resources and Sensitivities

A desktop evaluation of the Project Area was completed to review existing and available data regarding cultural resources in the area. Cultural resources field surveys were previously completed for approximately 80 percent of the Project Area. Surveys have not been conducted at approximately 19 proposed investigation locations due to lack of access and one location has only been partially surveyed.

A total of five cultural resources have been previously recorded adjacent to but outside of proposed investigation locations within the Project Area. These five resources include one prehistoric (early Native American) archaeological site, three historic (post-contact) archaeological sites, and one multicomponent archaeological site. No cultural resources are located at the proposed investigation locations or their corresponding work areas.

Archaeological sensitivity at the proposed investigation locations ranges from very high to low. The lack of recorded early Native American or historic-era resources within the valley plain in previously surveyed portions of the Project Area attests to the general absence of surface archaeological remains in that portion of the Project Area. However, not all archaeological sites are clearly visible on the ground surface. This is particularly true of prehistoric sites that may have been created hundreds or thousands of years ago and which have since been buried by alluvium from flooding of rivers and streams or slope wash.

The most sensitive areas (rated high to very high) for buried resources in the Project Area include the Late Holocene deposits found in the valley plain from the Sacramento River west to about the GCID Main Canal. In contrast, the Project Area west of the GCID Main Canal, where the low rolling foothills of the Coast Range emerge from the valley plain, has an overall low sensitivity rating with very localized areas of higher sensitivities. However, some Holocene deposits have been identified previously in this region along drainages, and so buried cultural resources could be encountered in localized places. The area of Funks Creek to the east and west of Funks Reservoir, as well as other minor drainages nearby, have high and very high sensitivity ratings.

Other proposed investigation locations are less sensitive for the presence of buried cultural resources because they are underlain by geological formations that are of an age that are too old to contain remnants of human occupancy (pre-Late Pleistocene). Nevertheless, any location along a drainage with recent alluvium has an increased sensitivity for buried archaeological remains.

A combination of data, published reports, and a review of the existing conditions in the Project Area was used to evaluate the potential impacts on cultural resources that could occur as a result of the proposed investigations.

Impact Analysis

The Proposed Project's potential impacts on historic resources, unique archaeological resources, and human burials are discussed below. Where mitigation is warranted to ensure that potential impacts to cultural resources are avoided and minimized, details are also provided. All cultural resources mitigation measures, MM Cul-1 through MM Cul-7 are provided in Table 10. If all significant impacts to cultural resources cannot be avoided by implementation of MM Cul-1 through MM Cul-7, the investigation sites will be re-evaluated with implementation of MM Gen-2 (Section 2.3 *Project Description*), and potentially removed from the Proposed Project.

a) Built Historic Resources

Proposed activities would include field investigations using test pit and trench excavations (Section 2.3 *Project Description*). Minor site preparation may be necessary at each investigation location. Vehicle and equipment access and staging (including trucks) and equipment maneuvering would occur on site, all of which are unlikely to disturb or destroy built environment resources. A desktop evaluation of the Project Area was conducted, and GIS data was reviewed to avoid siting investigations near known built environment resources.

The Proposed Project activities are unlikely to have the potential to impact built historic resources because the work would be conducted in the ground and would not be conducted in a building, structure, or object. No built historic resources have been identified within the area of investigations but, without mitigation, the potential for impacts in the Project Area still remains because a full built environment resources inventory of the Project Area has not occurred due to a lack of access, as described above. However, the impacts would be reduced to less-than-significance with mitigation. Implementation of MM Gen-1 will require a cultural resource specialist to assess the proposed investigation locations at least one week prior to mobilization. In addition, to ensure that impacts to built historic resources would be further avoided and minimized, the Authority would implement MM Cul-1 and MM Cul-2. If the proposed investigations still cannot avoid effects to built historic resources, the Authority would implement MM Gen-2. Therefore, impacts on built historic resources would be less than significant with mitigation incorporated.

b) Archaeological Resources

A desktop evaluation of the Project Area was conducted and GIS data was reviewed to avoid siting investigations near known archaeological resources. However, without mitigation, , test pits and trenches would have the potential to disturb buried archaeological sites, if any are present, by excavating subsurface soils and removing cultural materials when soils are extracted. Archaeological sites could also be disturbed as a result of ground disturbance caused while accessing the investigation locations and while staging and preparing the ground surface for the test pits and trenching excavations. No previously recorded archaeological resources are located within the Project Area, but previously unidentified archaeological resources could be encountered during implementation.

Thus, without mitigation, the proposed investigations could affect unidentified archaeological resources if they are present in the Project Area. Implementation of MM Gen-1 will require a cultural resource specialist to assess the proposed investigation locations at least one week prior to mobilization. In addition, to ensure that impacts to archaeological resources would be further avoided and minimized, the Authority would implement MM Cul-1, MM Cul-2, and MM Cul-3, which includes development of a discovery plan that contains requirements regarding the methods and materials for conducting the test pit and trenching activities to facilitate archaeological site identification. Furthermore, implementation of MM Cul-4 and MM Cul-5 would build off of MM Cul-3 and would require sensitivity training and archaeological monitoring during the proposed investigations. Finally, implementation of MM Cul-6 would support identification and characterization of deeply buried archaeological sites during test pit and trenching activities. If the proposed investigations still cannot avoid effects to archaeological resources after implementation of these mitigation measures, the Authority would implement MM Gen-2. Therefore, impacts on archaeological resources would be less than significant with mitigation incorporated.

c) Human Remains

No known cemeteries occur within the proposed investigation locations. Nonetheless, human remains, including those interred outside of a dedicated cemetery, such as unmarked family graves, could be encountered during ground-disturbing activities associated with the Proposed Project.

The proposed investigations could affect unidentified human remains if they are present in the Project Area. Implementation of MM Gen-1 will require a cultural resource specialist to assess the proposed investigation locations at least one week prior to mobilization. In addition, to ensure that impacts to human remains would be further avoided and minimized, the Authority would implement MM Cul-1 through MM Cul-5, which would include development of a post-discovery review plan, sensitivity training, and archaeological monitoring during ground-disturbing activities.

In addition, implementation of MM Cul-7 would require that ground-disturbing activities be immediately halted if human remains are discovered, and preparation and implementation a burial treatment plan would be required. If the proposed investigations still cannot avoid effects to human remains after implementation of these mitigation measures, the Authority would implement MM Gen-2. Therefore, impacts on human remains would be less than significant with mitigation incorporated.

Mitigation

Table 10. Mitigation Measures for Cultural Resources

Mitigation Measure Title	Description
MM Cul-1: Avoid Impacts on Cultural Resources	Impacts on known historical resources, including prehistoric and historic-era archaeological sites, buildings, structures, and human remains will be avoided to the extent feasible. Methods of avoidance during Proposed Project planning shall include relocation of investigation locations to at least 50 feet away from any identified resource dependent upon the resource and the area, prioritizing the use of existing roadways or other previously disturbed locations for the investigations, rerouting of access routes and the installation of protective fencing around resources where appropriate.
MM Cul-2: Pre-activity Pedestrian Survey	Once the investigation sites have been confirmed, built resource surveys and archaeological surveys will be conducted in all work areas to identify whether any new or previously unidentified built historic resources or archaeological sites are present. This activity will be conducted regardless of whether a previous cultural resources survey has covered the area to ensure adequate coverage. All newly identified resources will be recorded on California Department of Parks and Recreation 523-Series forms. If archaeological resources that qualify as historic resources or unique archaeological resources under CEQA are identified during pre-activity survey, the Authority will ensure that they are avoided to the extent feasible by implementing the measures in MM Cul-1 (Avoid Impacts on Cultural Resources).
MM Cul-3: Prepare a Post-review Discovery Plan	Prior to the start of the Proposed Project investigation activities, a Post-review Discovery Plan (Plan) will be prepared by a qualified archaeologist. Not all cultural resources are visible on the ground surface. Protocols for addressing the accidental discovery of archaeological resources or human remains that are not visible on the ground surface during Proposed Project implementation shall be outlined in the Plan. The Plan shall be developed prior to ground disturbance so that all parties are aware of the actions required if buried archaeological resources are encountered during Proposed Project implementation. At a minimum, the Plan shall include protocols and procedures for addressing post-review discoveries including work stoppage at the discovery site and appropriate assessment of the discovery (see MM Cul-6, below), Archaeological Sensitivity Training for Proposed Project personnel, an Archaeological Monitoring Plan, and a Burial Treatment Plan. The Archaeological Sensitivity Training will cover the historical context, resource types (using representative photographs of soils, features or artifacts if appropriate) and legal status of known resources, regulatory protections, penalties for noncompliance, benefits of compliance, as well as the avoidance and minimization measures that the Proposed Project has implemented. The training will be conducted prior to the start of investigations. The Archaeological Monitoring Plan describes qualifications and protocols for monitoring Proposed Project-related ground disturbance, including the following: • Documentation and chain-of-command notifications. • Procedures for securing an area where cultural remains are discovered. • Procedures for evaluating the nature of the finds. • The schedule for notifications and conducting activities associated with evaluating the finds. • Protocols for establishing minimum depth of test pits and trenches when monitoring is no longer needed. • Specific activities to be monitored include excavation of test pits and trenching and related ground disturbing activities.

Mitigation Measure Title	Description
	The Burial Treatment Plan describes specific procedures for burial discovery, including documentation and chain-of-command notifications, and procedures for securing an area where burials are discovered.
MM Cul-4: Conduct Archaeological Sensitivity Training	The Authority will be responsible for obtaining the services of a qualified archaeologist to conduct archaeological sensitivity training (see MM Cul-3). Prior to the start of the Proposed Project investigations, a qualified archaeologist who meets the Secretary of the Interior's Standards will conduct a mandatory archaeological sensitivity training (see MM Cul-3) for all personnel involved in the investigations about cultural resources sensitivity in the Project Area and cultural resources that could be encountered during the Proposed Project investigations. Participants will be required to sign a form that states they have received and understand the training. The Authority will maintain the record of training and make it available to the Proposed Project's cultural resources staff. The Authority-provided cultural monitor will ensure that the new personnel brought onto the Proposed Project team receive the mandatory training before starting work.
MM Cul-5: Conduct Archaeological Monitoring	The Authority will be responsible for obtaining the services of a qualified archaeologist to conduct archaeological monitoring (see MM Cul-3). One qualified archaeological monitor shall monitor ground-disturbing activities associated with the Proposed Project (i.e., test pits and trenching). Once test pits and trenching activities reach depths exceeding that which is likely to encounter cultural remains as described and established in the Archaeological Monitoring Plan, monitoring is no longer necessary. One Native American monitor (as appropriate according to Proposed Project consultation with tribes) will also be invited to monitor these same Proposed Project ground disturbing activities. In accordance with Cul-6 (Immediately Halt Ground-disturbing Activities if Cultural Resources Are Discovered and Implement a Post-review Discovery Plan), if any important (potentially CRHR-eligible) prehistoric or historic-era features, or any human remains, are exposed during investigations, the archaeological monitor shall have the authority to notify the appropriate contractor supervisor to stop work in the vicinity of the find and implement the Post-review Discovery Plan. If human remains are encountered, the archaeological monitor will also initiate Cul-7 (Immediately Halt Ground-disturbing Activities if Human Remains Are Discovered and Implement a Burial Treatment Plan). Resources identified during investigation activities will be treated in accordance with MM Cul-1 (Avoid Impacts on Cultural Resources).
MM Cul-6: Immediately Halt Ground-disturbing Activities if Cultural Resources Are Discovered and Implement the Post-review Discovery Plan Prepared under MM Cul-1	If important (potentially eligible) cultural resources, such as structural features, unusual amounts of bone or shell, flaked or ground stone artifacts, historic-era artifacts, human remains, or architectural remains are encountered during any Proposed Project activities, work shall be suspended in coordination with the appropriate contractor supervisor immediately at the location of the find and within an appropriate radius, with a minimum of 50 feet. The Authority will implement MM Cul-1 (Avoid Impacts on Cultural Resources) and implement the Post-review Discovery Plan prepared under MM Cul-3. As part of the Post-review Discovery Plan, a qualified archaeologist shall conduct a field investigation of the find and recommend avoidance measures deemed necessary for the protection of any cultural resource concluded by the archaeologist to represent an historical resource or unique archaeological resource. If necessary, the qualified archaeologist shall recommend additional measures in consultation with the Authority and responsible agencies and, as appropriate, interested parties such as California Native American tribes. The Authority, in consultation with responsible agencies, will determine when/if ground-disturbing activities at the location may resume.

Mitigation Measure Title	Description
	All the activities identified above will be detailed in the Post-review Discovery Plan so that all parties are aware of the actions required if buried archaeological sites are encountered during Proposed Project implementation. Discoveries of human remains shall be treated as described in the following sections for Cul-7 (Immediately Halt Ground-disturbing Activities if Human Remains Are Discovered and Implement a Burial Treatment Plan).
MM Cul-7: Immediately Halt Ground-disturbing Activities if Human Remains Are Discovered and Implement a Burial Treatment Plan	In accordance with relevant provisions of the California Health and Safety Code, if human remains are uncovered during ground-disturbing activities, the potentially damaging excavation must halt in the area of the remains and the local County Coroner must be notified. The coroner is required to examine all discoveries of human remains within 48 hours of receiving notice of a discovery on private or State lands (Health and Safety Code Section 7050.5(b)). If the Coroner determines that the remains are those of a Native American, he or she must contact the California Native American Heritage Commission by phone within 24 hours of making that determination (Health and Safety Code Section 7050(c)). Pursuant to the provisions of Public Resources Code Section 5097.98, the California Native American Heritage Commission will identify a Most Likely Descendant. The Most Likely Descendant designated by the California Native American Heritage Commission will have at least 48 hours to inspect the site and propose treatment and disposition of the remains and any associated grave goods. All the activities identified above shall be detailed in a Burial Treatment Plan (MM Cul-3) developed in consultation with local Native American tribes prior to Proposed Project implementation. If human remains that are not of Native American origin are discovered, disposition of the remains shall be determined in consultation with the coroner or possible descendants if they can be identified.

8.0 Energy

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

Environmental Setting

Given the nature of the Proposed Project, the Proposed Project would consume energy in the form of transportation fuels such as gasoline and diesel for vehicle and equipment trips associated with the Project. The Proposed Project is located in Colusa, Glenn, and Yolo Counties.

The annual gasoline and diesel fuels sales in the three counties in 2020 are summarized in Table 11.

Table 11. Annual Gasoline and Diesel Fuel Sales by County in 2020

County	Gasoline (millions of gallons per year)	Diesel (millions of gallons per year)
Colusa	15	11
Glenn	15	18
Yolo	91	22

Source: California Energy Commission 2020

Impact Analysis

a) Implementation of the Proposed Project would consume energy in the form of transportation fuels (gasoline and diesel) from the use of equipment, crew vehicles, and the hauling of equipment and materials. Statewide regulations, such as AB 1493 and Advanced Clean Cars Program, are aimed at improving on-road vehicle fuel efficiency, resulting in reduced fuel consumption. Although the In-Use Off-Road Diesel-Fueled Fleets Regulation is aimed at reducing emissions from off-road diesel vehicles, compliance with the regulation also results in energy savings in the form of reduced fuel consumption from unnecessary idling. Conformance of vehicles and equipment to these statewide regulations is required and would avoid wasteful, inefficient, or unnecessary consumption of transportation fuel during construction. Therefore, the impact would be less than significant.

b) The Proposed Project would be consistent with the applicable energy-related goals and policies in the *Colusa County 2030 General Plan* (Colusa County 2011), *Glenn County General Plan* (Glenn

County 1993), and *Yolo County 2030 Countywide General Plan* (Yolo County 2009). Additionally, the Proposed Project would be subject to compliance with the statewide regulations and legislation aimed at improving vehicle fuel efficiency, improving energy efficiency, and enhancing energy conservation. Therefore, the Proposed Project would not conflict with a state or local plan for renewable energy or energy efficiency, resulting in no impact.

9.0 Geology and Soils

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving:				
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?	☐	☐	☒	☐
ii. Strong seismic ground shaking?	☐	☐	☒	☐
iii. Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv. Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☒
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	☐	☒
d) Be located on expansive soil, as defined in Table 18-1B of the Uniform Building Code (1994), creating substantial direct or indirect risk to life or property?	☐	☐	☒	☐

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐

Environmental Setting

Geology

The Project Area is situated within the boundary of the northern portions of the Coast Ranges and Great Valley Geomorphic Provinces. In the Project Area, the Coastal Range foothills surrounding the Antelope Valley consist generally of parallel northwest-trending ridges and valleys with slopes up to approximately 40 percent gradient. The average ground surface gradient in the Sacramento Valley is less than 1 percent.

The topography of the Project Area varies from west to east. The west side of the Project Area in the vicinity of Funks Reservoir is characterized by low rolling foothills of the Coast Ranges, and elevations range from approximately 400 to 800 feet above mean sea level (msl) in the hills surrounding Antelope Valley to 200 feet above msl in the Funks Reservoir area. From the Funks Reservoir, the valley gently slopes to the Project Area's lowest point, which is approximately 30 feet above msl at the eastern edge of the Project Area, south of Dunnigan.

The Great Valley Geomorphic Province has been filled with a thick (several miles deep) accumulation of alluvial sediments eroded from the adjacent ancestral Sierra Nevada and Klamath Mountain ranges (Wahrhaftig and Birman 1965). The ridges and valleys of the Coast Ranges were formed by active uplift related to the San Andreas fault/plate boundary system (Norris and Webb 1990). The valleys between the ridges are filled with a relatively thin (less than 50 feet) accumulation of alluvial soil. The general geologic formations underlying the Project Area include the following: upper cretaceous marine sedimentary rock of the Great Valley Sequence; quaternary terrace, fan, basin, and stream channel deposits; and tertiary nonmarine sedimentary rock.

Investigation sites within the Antelope Valley portion of the Project Area are underlain by sedimentary rocks of the Great Valley Sequence. Other Investigation areas in the northeastern portion of the Project Area are located in the Boxer Formation. Investigation areas along a prominent ridge on the east side of the Antelope Valley of the Project Area formed from the contact between the underlying Boxer Formation and the more resistant Cortina Formation. Other investigation areas within the Antelope Valley include the basal member of the Cortina Formation, the Venado Sandstone. Investigation areas between the proposed Sites Reservoir and the regulating reservoirs are also on the eastern slope of a prominent ridge of the Cortina Formation. The Boxer Formation is also present in this area as well as occasional younger Quaternary alluvial deposits. The Investigation areas farther east in the Project Area are underlain by the younger Quaternary deposits, which are estimated to overlay the Cortina Formation and are bordered by the Tehama Formation. Geologic units underneath and adjacent to this area consist of basin deposits and the Lower Riverbank Formation.

Soils

Floodplains extending along both sides of the Sacramento River slope gently away from the river to the Butte Sink to the east and Colusa Basin to the west. Frequent overflows under natural conditions have deposited loamy soils high in content of silt and fine sand. A levee system combined with Shasta Reservoir upstream helps to control Sacramento River waters so that floodplains are no longer flooded on a regular basis. The soils on the floodplains along the Sacramento River are fertile and are among the best soils in the Sacramento Valley. West from the floodplains along the Sacramento River, the Colusa Basin extends north and south through the Project Area. Overflows containing clayey sediments from the Sacramento River and foothill streams regularly filled the Colusa Basin. The basin is mostly leveled for rice production. Salts in the clayey sediments from the foothill streams were deposited in the basin soils, particularly Willows soils; and reclamation of the soils has been ongoing since early in the twentieth century. Most basin soils have been reclaimed to several feet.

Alluvial fans exist along the western side of the Sacramento Valley. They originate at the base of the foothills, at elevations of 200 to 400 feet, and gently descend to the east for several miles to the Colusa Basin. Under natural conditions, streams from the foothills flooded these alluvial fans, depositing fertile loamy soils. The Coast Range foothills have gently sloping clayey soils and some areas of loamy soils overlying the Great Valley Sequence.

Paleontology

Guidelines for paleontological resources assessments (Society of Vertebrate Paleontology 2010) call for the inventory of all geological units within 1 mile of the ground-disturbing activities associated with any project to ensure that both surficial geologic units and geologic units that would be encountered in the subsurface are adequately analyzed. These geological units are then evaluated for paleontological sensitivity.

The paleontological sensitivity of a rock unit is qualitatively determined by the likelihood that it would yield identifiable, unique, or scientifically important fossils. The fundamental assumption (Society of Vertebrate Paleontology 2010) is that formations would yield fossils of similar quality and quantity to what they have produced in the past. The paleontological sensitivity of any part of the Project Area depends almost entirely on its geology.

All geologic units in the Project Area that was found to have plant or invertebrate fossils also contained vertebrate fossils and were therefore considered sensitive (University of California Museum of Paleontology 2020). However, no rare or unique occurrences of plant or invertebrate fossils are known to occur in the Project Area. The paleontological sensitivity of the geologic units in the Project Area is summarized in Table 12.

Table 12. University of California Museum of Paleontology Vertebrate Fossil Records

Map Symbol	Unit and Age	Records Throughout Formation's Extent	Records in Project Area Counties	Paleontological Sensitivity
Qmu and Qml	Modesto Formation, upper and lower member, Pleistocene	27	8 – in Yolo County	High
Qru and Qrl	Riverbank Formation, upper and lower members, Pleistocene	350	0	High
Qrb	Red Bluff Formation, Pleistocene	2	2 – in Yolo County	High

Map Symbol	Unit and Age	Records Throughout Formation's Extent	Records in Project Area Counties	Paleontological Sensitivity
pTms	Great Valley sequence, general, Cretaceous (see description of geologic unit for assumption regarding pTms in Project Area)	None for sequence overall, but some formations may be fossil bearing	0	Low to Unknown
Kcy	Great Valley sequence, Cortina Formation, Yolo Member, Upper Cretaceous	0	0	Low
Kcv	Great Valley sequence, Cortina Formation, Venado Member, Upper Cretaceous	0	0	Low
Kb	Great Valley sequence, Boxer Formation, Upper Cretaceous	0	0	Low

Source: University of California Museum of Paleontology 2020

Impact Analysis

ai) The Proposed Project is not located within an Alquist-Priolo Earthquake Fault Zone (DOC 2021). No known active faults have been mapped within the Project Area (DOC 2022e). Inactive faults pass near the proposed Investigation locations, such as the Salt Lake Fault on the northern end of the Antelope Valley in the Project Area. Fault studies are included in the Proposed Project to gather information regarding the location and stratigraphy in areas of suspected and known fault traces/zones and to further evaluate the areas for evidence of last movement. The proposed investigations could occur at other unrecorded inactive fault locations, but any faults in the Antelope Valley are buried beneath alluvial soil thicker than the proposed investigation depths for quarry studies or test pits. Therefore, the Proposed Project would not directly or indirectly cause substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault. As a result, a less-than-significant impact would occur.

aii) No known active faults have been mapped within the Project Area (DOC 2022e). According to the *Earthquake Shaking Potential for California* map (Branum et al. 2016), the potential for ground shaking during earthquakes within the Project Area is low to moderate. The Proposed Project, which involves temporary, discrete and localized investigations, would not directly or indirectly cause substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking. As a result, no impact would occur.

aiii) The Project Area is not located within a liquefaction zone (DOC 2021). Therefore, the Proposed Project would not directly or indirectly cause substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction. As a result, no impact would occur.

aiv) The Project Area is not located within a landslide zone (DOC 2021). Therefore, the Proposed Project would not directly or indirectly cause substantial adverse effects, including the risk of loss, injury, or death involving landslides. As a result, no impact would occur.

b) In most cases, proposed investigation areas would be located to avoid steeply sloped areas. Minimal grading may be required at select Investigation locations. Upon completion of each proposed investigation, the areas would be returned to their original conditions. As such, substantial soil erosion or loss of topsoil is not anticipated. Therefore, the Proposed Project would have no impact related to soil erosion or the loss of topsoil.

c) The Project Area is not located within a landslide or liquefaction zone (DOC 2021). The Project Area generally does not contain unstable soils, and changes would not be made to the ground that would cause it to become unstable. Therefore, the Proposed Project would not be located on a geologic unit or soil that is unstable or that would become unstable due to the Proposed Project. As a result, no impact would occur.

d) Expansive soils are subject to shrinking and swelling with seasonal changes in moisture content. Soil expansion and contraction can cause damage or failure of foundations, utilities, and pavements. Most of the proposed investigations would be located within Antelope Valley. Most of the soils in Antelope Valley are clayey and have high expansion potential. Although the Proposed Project may be located on expansive soil, it would involve only temporary, discrete and localized investigations; it would not include habitable structures or buildings, and a limited number of workers would be required at each of the proposed Investigation locations. Therefore, the Proposed Project would not create a substantial direct or indirect risk to life or property because of expansive soils, resulting in a less-than-significant impact.

e) No septic tanks or alternative wastewater disposal systems are included as part of the Proposed Project. Therefore, the Proposed Project would not locate septic tanks or alternative wastewater disposal systems on soils incapable of adequate support, resulting in no impact.

f) Several proposed investigations would occur within areas underlain by the low- to moderate-sensitivity Cortina Formation, low-sensitivity Boxer Formation, low-sensitivity Quaternary alluvium, low-sensitivity basin fill and deposits, moderate-sensitivity Riverbank Formation, and moderate-sensitivity Modesto Formation. As summarized in Table 10, paleontological resources could be encountered inadvertently in the Project Area during the proposed investigations. Without mitigation, the Proposed Project could directly or indirectly destroy a paleontological resource in the Project Area. This is considered a potentially significant impact.

   The Authority would implement MM Geo-1 (see Table 13 below), which would require that a qualified paleontologist be notified if vertebrate or plant fossils are discovered, and that the fossil would be evaluated for its unique properties and protected by extraction, preservation, and curation by a qualified paleontologist. Therefore, impacts on paleontological resources would be less than significant with mitigation incorporated.

Mitigation

Table 13. Mitigation Measure for Paleontological Resources

Mitigation Measure Title	Description
MM Geo-1: Consult with Qualified Paleontologist if Paleontological Resources Were Discovered	The proposed investigations have the potential to have impacts on unidentified paleontological resources. If vertebrate or plant fossils are discovered during field activities, the Authority would be notified, and the fossil would be evaluated for its unique properties and protected by extraction, preservation, and curation by a qualified paleontologist.

10.0 Greenhouse Gas Emissions

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

Environmental Setting

Climate variability is a complex phenomenon that has the potential to alter local climatic patterns and meteorology. Increases in anthropogenic greenhouse gas (GHG) emissions have been unequivocally linked to recent warming and climate shifts (Intergovernmental Panel on Climate Change 2007). Although modeling indicates that climate variability will result globally and regionally, there remains uncertainty about characterizing the precise local climate characteristics and predicting precisely how various ecological and social systems will react to any changes in the existing climate at the local level. Regardless of this uncertainty in precise predictions, it is widely understood that some degree of climate variability is expected because of past and future GHG emissions.

The key GHGs resulting from human activity are carbon dioxide, methane, nitrous oxide, and several fluorine-containing halogenated substances such as hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and nitrogen trifluoride. Unlike criteria air pollutants, which occur locally or regionally, the long atmospheric lifetimes of these GHGs allow them to be well mixed in the atmosphere and transported over distances.

In 2020, GHG emissions in the United States totaled 5,222 million metric tons (MT) of carbon dioxide equivalent (CO_2e) (USEPA 2022). Transportation represented 27 percent, electricity represented 25 percent, industry represented 24 percent, commercial and residential represented 13 percent, and agriculture represented 11 percent of the total GHG emissions in the United States (USEPA 2022).

In 2019, total GHG emissions within California were 418.2 million MT of CO_2e (ARB 2021). Transportation represented 41 percent, industry represented 24 percent, in-state electricity generation represented 9 percent, residential represented 8 percent, agriculture and forestry represented 7 percent, commercial represented 6 percent, and electricity imports represented 5 percent of the total GHG emissions within California (ARB 2021).

There is no federal overarching law specifically related to climate variability or the reduction of GHGs. California has adopted statewide legislation addressing various aspects of climate variability and GHG emissions mitigation. Much of this legislation establishes a broad framework for the state's long-term reduction of GHG emissions, including Assembly Bill (AB) 32 and Senate Bill (SB) 32, which outline

statewide goals to reduce GHG emissions back to 1990 levels by 2020 and 40 percent below 1990 levels by 2030, respectively.

The Proposed Project is within the jurisdiction of GCAPCD, CCAPCD, and YSAQMD. The GCAPCD, CCAPCD, and YSAQMD have not adopted thresholds of significance for GHG emissions.

Impact Analysis

a) Implementation of the Proposed Project would generate minor, temporary GHG emissions from the use of equipment listed in Table 2 in *Project Description*. The proposed investigations would occur between January 2023 and December 2024. Activities at each investigation location would require up to 10 to 15 personnel. Each investigation site would be active for a period ranging from 1 day to 25 days, depending on the conditions and investigation type. Individual investigation sites would constitute less than 0.025 acre of ground disturbance. The total area of ground disturbance associated with the Proposed Project would be approximately 6.2 acres.

   GHG emissions generated during the proposed investigations were estimated using CalEEMod at a maximum of 2,484.42 MT of CO_2e; further, after the two-year construction period is completed, there would be no additional GHG emissions from the Proposed Project. The detailed CalEEMod output is included as Appendix C. As discussed above, GCAPCD, CCAPCD, and YSAQMD have not adopted thresholds of significance for GHG emissions. The GHG emissions anticipated from implementation of the Proposed Project would represent would have a negligible effect on global climate variability. Therefore, the Proposed Project would generate GHG emissions that have a less-than-significant impact on the environment.

b) SB 32, which mandates a GHG reduction target of 40 percent below 1990 levels by 2030, is the current legislation to reduce GHG emissions within California. Implementation of the Proposed Project would generate minor, short-term GHG emissions over a two-year construction period, without any GHG emissions from the Proposed Project after that period, which would not conflict with the GHG emissions reduction goals set forth by SB 32. Therefore, the Proposed Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions, resulting in no impact.

11.0 Hazards and Hazardous Materials

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the likely 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?	☐	☐	☒	☐

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?	☐	☐	☒	☐

Environmental Setting

Hazardous materials are defined in Section 66260.10, Title 22, of the *California Code of Regulations* as:

> *A substance or combination of substances which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may either (1) cause, or significantly contribute to, an increase in mortality or an increase in serious, irreversible, or incapacitating reversible, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported, or disposed of or otherwise managed.*

In addition, California Health a*nd Safety Code Section 25501 defines a hazardous material as follows:*

> *Any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. "Hazardous materials" include, but are not limited to, hazardous substances, hazardous waste, and any material which a handler or the administering agency has a reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or environment.*

Federal, State, and local regulatory agencies' published databases were reviewed to identify potential hazardous materials issues in the project area. Findings from the database/records reviews were evaluated according to proximity to the proposed investigation areas, anticipated activities, and likelihood of hazardous materials-related exposure.

EnviroStor is the Department of Toxic Substances Control's (DTSC) data management system for tracking cleanup, permitting, enforcement and investigation efforts at hazardous waste facilities and sites with known contamination or sites where there may be reasons to investigate further. A review of the EnviroStor database indicated that there are no hazardous sites on or in the vicinity of the proposed investigations (DTSC 2022).

GeoTracker is the State Water Resources Control Board's (SWRCB) data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater. GeoTracker contains records for sites that require cleanup, such as Leaking Underground Storage Tank Sites, Department of Defense Sites, and Cleanup Program Sites. A review of the GeoTracker database found no sites on or in the vicinity of the proposed investigations (SWRCB 2022).

Most of the Proposed Project Area has historically been or is presently used for agricultural purposes. As a result, soils contaminated with pesticides, herbicides, and other agricultural chemicals, even though properly applied, may be present in the Proposed Project Area. In addition to pesticide and fertilizer use, there are other agricultural practices that can involve hazardous materials. Farming properties often have land that is not engaged directly in crop production (e.g., buildings used for equipment storage and maintenance). These properties may also have aboveground storage tanks (ASTs) and underground

storage tanks (USTs) potentially containing hazardous materials (e.g., fuel, fertilizer) used in farming operations. None of the proposed investigations are located on or in the vicinity of farms that are listed in the relevant federal or state databases for contaminated sites. Other potential hazardous material concerns in the area include historical salt mining and oil wells. High arsenic levels have been found in the Project Area. Salt Lake, which is located within the northeastern portion of the Project Area, has high arsenic levels; however, no investigations are proposed in this area. None of the proposed investigations are in the vicinity of a Union Pacific Railroad line.

Many roads in the project area have been used by motorized vehicles since at least the 1950s and surface soils could have been affected by aerially deposited lead (ADL) from the historical use of leaded gasoline. The alignment of the underground Dunnigan Pipeline would extend through existing agricultural lands and cross beneath I-5, County Road 99W, Ritchie Bros. auction yard, and the Union Pacific Railroad line. These areas have a high potential for containing ADL given their present and historical uses and a test pit is proposed in the vicinity of these areas. Other roads in the project area are not expected to contain a substantial build-up of ADL.

Impact Analysis

a) Equipment required for implementation of the proposed investigations would require the use of fuels, oils, grease, and lubricants. Maintenance and repair of the equipment would be completed at established off-site locations. Implementation of Standard Protocols and Procedures including SWPPP and BMPs; Spill Prevention and Hazardous Materials Management; and preparation of a HSSE, would avoid and minimize the potential release of hazardous materials from routine transport, use, or disposal of hazardous materials. Through implementation of these Standard Protocols and Procedures as part of the Proposed Project, impacts related to routine transport, use, or disposal of hazardous materials would be less than significant.

b) Equipment required for implementation of the proposed investigations would require the use of fuels, oils, grease, and lubricants. Maintenance and repair of the equipment would be completed at established off-site locations. Implementation of Standard Protocols and Procedures including Traffic Management and Hazards; Access for Emergency Vehicles; SWPPP and BMPs; Spill Prevention and Hazardous Materials Management; and preparation of a HSSE, would avoid and minimize the potential release of hazardous materials through upset or accident conditions. Through implementation of these Standard Protocols and Procedures as part of the Proposed Project, impacts related to accidental release of hazardous materials into the environment would be less than significant.

c) Implementation of the Proposed Project would not require work to be conducted within 0.25 mile of a school. Therefore, the Proposed Project would not emit hazardous emissions or handle hazardous materials within 0.25 mile of a school. As a result, no impact would occur.

d) The results of the agency database review indicate that none of the proposed Investigation areas would occur on a site that is included on any list of hazardous materials sites, including the list compiled pursuant to Government Code Section 65962.5. It is nevertheless possible that hazardous materials could be encountered due to unreported underground structures such as septic tanks and USTs. If such materials are encountered during implementation of the Proposed Project, they would be handled in accordance with the governing state and federal laws and regulations for the handling and disposal of hazardous materials. Any impacts resulting from the Proposed Project would be less than significant.

e) There are no public airports or private air strips within 2 miles of the Proposed Project. Therefore, the Proposed Project would not result in airport-related safety hazards toward people residing or working in the Project area. As a result, no impact would occur.

f) The equipment and materials required for the proposed investigations would be transported on local roads, and would involve usage of over-sized vehicles. Each investigation site would be active for a period ranging from 1-2 days for a test pit, up to 4 days for a quarry study, and up to 25 days for a fault study. Therefore, although no full road closures are anticipated, temporary (that is, 1 to 25 days) individual lane closures may be necessary during the Proposed Project implementation period for trucks and equipment to enter the roadways. Standard Protocols and Procedures for Traffic Management and Hazards and Access for Emergency Vehicles would be implemented as part of the Proposed Project to avoid and minimize potential effects on emergency and/or evacuation responses. Therefore, the Proposed Project would not interfere with an adopted emergency response plan or emergency evacuation plan in the Project Area, resulting in a less-than-significant impact.

g) The Project Area is primarily located in a moderate Fire Hazard Severity Zone (FHSZ) (California Department of Fire and Forestry [CAL FIRE] 2007a, 2007b, and 2007c). The Standard Protocol and Procedures for Emergency Access would be implemented as part of the Proposed Project and would require that access for emergency vehicles on all roadways in the Project Area be maintained for the duration of the proposed investigations. Therefore, the Proposed Project would not expose people or structures to risks involving wildland fires, resulting in a less-than-significant impact.

12.0 Hydrology and Water Quality

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
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 offsite;	☐	☐	☒	☐
iii. create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☒	☐
iv. impede or redirect flood flows?	☐	☐	☒	☐

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☐	☐	☒

Environmental Setting

The Proposed Project is located in the Northern Sacramento Valley, within Colusa, Glenn, and Yolo Counties. The Project Area for surface water includes streams, drainages, and conveyance facilities associated with water supply and floodwater management in the various locations in and around the Sites Valley and adjacent areas in Colusa, Glenn, and Yolo Counties and hydrologically connected surrounding areas. The Project Area for groundwater includes the Funks Creek and Antelope Creek Basins, and the Colusa and Yolo Subbasins of the Sacramento Valley Groundwater Basin.

Surface Water and Surface Water Quality

Multiple small creeks are located within the Project Area. These local creeks originate in the eastern foothills of the Coast Range and drain east towards the Sacramento Valley subregion of the Central Valley. The creek located to the north of the inundation area is Hunters Creek and the primary drainages in the inundation area are Funks Creek and Stone Corral Creek. These creeks originate at elevations below the snow line of the Coast Range and consequently do not receive cold snowmelt water. Rather, they respond rapidly to significant rainfall events, flash flooding, and substantial overland flow. Other local creeks are also present in the Project Area.

Water quality in these streams is directly influenced by the geology of the streams as well as agricultural (mostly cattle grazing) land uses. Surface water quality of the streams supports aquatic and terrestrial habitat. DWR observed aluminum, arsenic, copper, iron, manganese, mercury, nickel, and phosphorus in Funks Creek at the GCID Main Canal station during intermittent water quality sampling. Aluminum, arsenic, copper, iron, manganese, nickel, and phosphorus were observed by DWR in Stone Corral Creek near Sites station during intermittent water quality sampling. DWR has previously observed aluminum, arsenic, cadmium, and iron during intermittent sampling in the Tehama-Colusa Canal downstream of the siphon under Stony Creek during intermittent water quality sampling. DWR also observed aluminum, arsenic, cadmium, copper, iron, mercury, manganese, and phosphorus during intermittent sampling in the Glenn-Colusa Irrigation District Main Canal.

Groundwater and Groundwater Quality

The Colusa Subbasin has a surface area of approximately 918,380 acres (1,434 square miles), and the estimated storage capacity to a depth of 200 feet is approximately 13,025,887 acre-feet (DWR 2006). Groundwater within the Colusa Subbasin generally flows from the recharge areas along the basin margin in the west to the east/southeast toward the Sacramento River. Recent depth to groundwater was generally less than 10 to 20 feet below ground surface across much of the subbasin during spring 2016, and generally 20 to 40 feet below ground surface during fall 2015 (DWR 2017). The *Colusa Subbasin Groundwater Sustainability Plan* guides the management and use of groundwater in the Colusa Subbasin

in a manner that can be maintained without causing undesirable results, such as reduction of groundwater storage, sea water intrusion, and degraded water quality (Colusa Groundwater Authority and Glenn Groundwater Authority 2021).

Groundwater quality in the Project Area has been classified as fair to good; however, it does have high mineral content. Fifteen wells within the Project Area were sampled in 2005. Salinity, measured as specific conductance, ranged from 680 to 2,190 micromhos per centimeter, and total dissolved solids (TDS) values ranged from 375 to 1,291 milligrams per liter. Sampling revealed that no Primary Maximum Contaminant Levels (MCLs) were exceeded. Of the 15 wells sampled, Secondary MCLs were exceeded in various wells for TDS, specific conductance, sulfate, pH, manganese, iron, aluminum, and chloride. Agricultural Water Quality Goals from the Food and Agriculture Organization of the United Nations (Central Valley Regional Water Quality Control Board 2019) were exceeded for specific conductance and TDS, sodium, chloride, boron, pH, and selenium.

Groundwater in the area of Funks Reservoir is extremely high in mineral content. The Primary MCL for arsenic was exceeded, and Secondary MCLs were exceeded for chloride, specific conductance, and manganese. TDS Agricultural Water Quality Goals were exceeded for boron, chloride, and manganese. Groundwater sampling along the length of the Tehama-Colusa Canal indicated that the quality of the groundwater along the canal is generally good, with a few impairments. Nitrate values exceeded the Primary MCL from one well. Secondary MCLs were exceeded for specific conductance, iron, TDS, and pH. Agricultural Water Quality Goals were exceeded for specific conductance, boron, TDS, copper, sodium, and pH (DWR 2007).

Impact Analysis

a) The proposed investigations have been sited to avoid known wells and if unrecorded wells are located during MM GEN-1 field studies, the investigation site will be relocated; therefore, the Proposed Project is not anticipated to affect groundwater quality. Further, the Standard Protocols and Procedures related to SWPPP and Spill Prevention and Hazardous Materials Management would be implemented as part of the Proposed Project to minimize any potential water quality impacts to surface waters from erosion and sedimentation during Project construction. Therefore, the Proposed Project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality. As a result, the impact would be less-than-significant impact.

b) No groundwater is anticipated to be used or removed for the proposed investigations, which have been sited to avoid known wells. Further, if unrecorded wells are located during MM GEN-1 field studies, the investigation site will be relocated to avoid effects. Therefore, the Proposed Project would not degrade groundwater quality, decrease groundwater supplies, or interfere with groundwater recharge. As a result, there would be no impact on groundwater.

ci) The Proposed Project would not substantially alter the existing drainage pattern of the site or area. It would not alter the course of any stream or river, and it would not add any new impervious surface. As noted above, without proper controls, the potential exists for Project construction activities to affect surface water quality through erosion and sedimentation. . The Proposed Project includes implementation of Standard Protocols and Procedures related to the SWPPP and Standard Fugitive Dust Control, which will minimize the potential for impacts related to erosion and siltation. Therefore, the Proposed Project would not result in substantial erosion or siltation on or off-site, resulting in a less-than-significant impact.

cii) The Proposed Project would not substantially increase the rate or amount of surface runoff. Ground disturbance as a result of the proposed investigations would be localized and temporary, and the proposed Investigation areas would be restored to original conditions and topography after the investigations are complete, such that existing conditions would not be

permanently altered. Therefore, the Proposed Project would not result in flooding on-site or off-site, resulting in a less-than-significant impact.

ciii) The Proposed Project would not 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. As described above, the Proposed Project would not alter the course of any stream or river, it would not add any new impervious surfaces, it would not alter drainage patterns, and it would not substantially increase the rate or amount of surface runoff. Ground disturbance would be temporary and localized, and the proposed Investigation areas would be restored to original conditions and topography after the investigations are complete, such that existing conditions would not be permanently altered. The Proposed Project also includes implementation of Standard Protocols and Procedures related to SWPPP and Spill Prevention and Hazardous Materials Management, which will further minimize the potential for impacts related to polluted runoff. Therefore, the impacts would be less than significant.

civ) For all of the reasons stated above, the Proposed Project would not impede, redirect or affect flood flows. Therefore, the impacts would be less than significant.

d) The Proposed Project is not located in a tsunami or seiche zone. Therefore, there would be no impacts related to tsunamis or seiches.

e) The *Colusa Subbasin Groundwater Sustainability Plan* (Colusa Groundwater Authority and Glenn Groundwater Authority 2021) was developed to meet the requirements under the Sustainable Groundwater Management Act for the entire Colusa Subbasin. No groundwater is anticipated to be used or removed for proposed investigations. The proposed investigations have been sited to avoid known wells; therefore, there are no anticipated impacts to groundwater wells or groundwater supply in the Proposed Project Area. Therefore, the Proposed Project would not conflict with the *Colusa Subbasin Groundwater Sustainability Plan*, resulting in no impact.

13.0 Land Use and Planning

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

Environmental Setting

The Proposed Project is located in Colusa, Glen, and Yolo counties.

In Colusa County, proposed investigations would be located within the Agricultural Upland, Agricultural General, and State, Federal or Other Agency land use designations (Colusa County 2022). The proposed investigations within Colusa County would be located on lands zoned as F-A Foothill Agriculture, E-A Exclusive Agriculture, and State, Federal, and Other Agency Lands (Colusa County 2022).

In Glenn County, proposed investigations would be located within the Foothill Agriculture/Forestry and Intensive Agriculture land use designations (Glenn County 2022). The proposed investigations within Glenn County would be located on lands zoned as Agricultural Preserve AP (Glenn County 2022).

In Yolo County, proposed investigations would be located within the Commercial General land use designation (Yolo County 2022). The proposed investigations within Yolo County would be located on lands zoned as C-H Highway Service Commercial (Yolo County 2022).

Impact Analysis

a) The Project Area is primarily rural in character, containing a limited number of rural residences and businesses. Effects on land uses would not be spread over the entirety of the Project Area but would be limited to individual investigation locations. Individual Investigation areas would be less than 0.025 acre per site. Investigation activities would result in minor, localized and short-term effects immediately surrounding each site and would not affect existing land uses, including residences or businesses. Therefore, the Proposed Project would not physically divide an established community, resulting in no impact.

b) The Proposed Project would be consistent with the land use policies, plans, and regulations outlined in the Colusa, Glenn, and Yolo County general plans. Further, the Proposed Project would be temporary and short-term and would not change the existing land use designations within the Project Area. Therefore, the Proposed Project would not conflict with any land use plan, policy or regulation, resulting in no impact.

14.0 Mineral Resources

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

Environmental Setting

The Surface Mining and Reclamation Act of 1975 (SMARA) requires the State Geologist to classify land according to the presence or absence of significant mineral deposits in in the state. Pursuant to the SMARA, the California State Mining and Geology Board oversees the Mineral Resource Zone (MRZ) classification system. The MRZ system characterizes both the location and known/presumed economic value of underlying mineral resources.

There are two primary categories of mineral resources that occur in the Project Area are aggregate resources and natural gas. The Project Area is not located within any MRZ (California Geological Survey 2022, Glenn County 2020). There are no active mines within the Project Area (DOC 2022f). There are no active natural gas wells in the Project Area (DOC 2022g).

Impact Analysis

a) As discussed in the *Environmental Setting* above, proposed investigations would occur in areas where there are no MRZs, active mines, or active natural gas wells. Therefore, the Proposed Project would not 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. As a result, no impact would occur.

b) As discussed in the *Environmental Setting* above, proposed investigations would occur in areas where there are no MRZs, active mines, or active natural gas wells. Therefore, the Proposed Project would not 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. As a result, no impact would occur.

15.0 Noise

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project result in:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Generation of excessive 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?	☐	☐	☐	☒

Environmental Setting

Noise is defined as unwanted sound. Levels of sound are measured and expressed in decibels (dB). Airborne sound is a rapid fluctuation of air pressure above and below atmospheric pressure. Methods used to measure or quantify sound levels depend on the source, the receiver, and the reason for measurement. The effects of noise on people can be generally categorized into subjective effects of annoyance/nuisance, interference with activities (e.g., speech, sleep, learning), and physiological effects, such as startling and hearing loss. The presence of sensitive receptors (e.g., residences, schools, hospitals) is typically used in the evaluation of current and anticipated noise levels and impacts.

The Project Area spans portions of Colusa, Glenn, and Yolo Counties and is primarily rural in character, containing a limited number of rural residences and businesses. The noise elements of the three counties govern the regulation of temporary and long-term noise levels.

Ambient noise levels in portions of Colusa County, where the majority of the proposed investigations are located, are defined primarily by traffic on major roadways, including, but not limited to, Interstate (I)-5, State Route (SR) 16, and SR 20. Agricultural activities, as well as aircraft noise from the Colusa County Airport, also contribute to the noise environment. In addition, there are numerous stationary noise sources (e.g., quarry operations, lumber mills, industrial facilities) dispersed throughout Colusa County (Colusa County 2011).

Ambient noise levels in portions of Glenn County are defined primarily by traffic on major roadways, including, but not limited to, I-5 and SR 162. Aircraft noise from the Willow-Glenn County Airport also contributes to the noise environment. In addition, agricultural-related noises contribute to the noise environment, and there are numerous stationary noise sources throughout Glenn County (Glenn County 1993).

Ambient noise levels in portions of Yolo County are defined primarily by traffic on major roadways, including but not limited to, I-80, I-5, and SR 113. Aircraft noise from the Yolo County Airport, Watts-Woodland Airport, University Airport, and Borges-Clarksburg Airport, which are located within Yolo County, and the Sacramento International Airport, which is located outside of Yolo County, contributes to the noise environment. There are also numerous stationary sources (e.g., farming, mining, industry and food processing, and construction) in Yolo County (Yolo County 2009). As such, the sound levels in the three counties are expected to be similar and low given the rural nature of all sites.

Colusa and Glenn Counties have ordinances that exempt most construction-related noise during specific times and days. Glenn County Ordinance 1183 exempts construction site sounds from 7:00 a.m. to 7:00 p.m. daily. Colusa County Ordinance 730 exempts construction and maintenance activities that are authorized by valid county permit or business license from the aforementioned noise ordinance from 7:00 a.m. to 7:00 p.m. on weekdays and 8:00 a.m. to 8:00 p.m. on weekends. This exemption applies when one of the following criteria is satisfied: no individual piece of equipment exceeds 83 dBA at a distance of 25 feet, or the noise level at any point outside of the property plane does not exceed 86 dBA. Yolo County does not have a noise ordinance or other noise enforcement code at the present time.

The majority of the proposed investigations are located within Colusa County in what is currently a rural and sparsely populated area. A limited number of rural residences and one paved road (Maxwell Sites Road, which continues west and becomes Sites Lodoga Road) are in the vicinity of the Investigation areas. Ambient noise levels in this area are generally low due to the few roads and sparse population. The primary noise sources are periodic rural road traffic noise and noise associated with ranching operations. Residences located in the community of Sites are approximately 140 feet from the nearest proposed investigations. The northern portion of the Project Area is located within Glenn County and no developed road access exists in this area. Ambient noise levels in this area are generally low due to the general lack of roads and associated limited accessibility of the area, as well as small number of residences. Similarly, few residences are located near the proposed investigations along the proposed Dunnigan Pipeline in Yolo County.

Impact Analysis

a) The evaluation of potential noise-related impacts accounted for the presence (or lack) of sensitive receptors within or adjacent to the Project Area, anticipated equipment and associated typical noise-level generation, and existing local regulatory standards and ordinances. The assessment of noise levels also included reviewing the need for mobile versus stationary noise emission sources and the duration of the proposed investigations at each location, which would vary from 1 day to 25 days, depending on the conditions and activity.

   The proposed investigations are anticipated to be similar in noise level to general construction activities, but more limited in duration. Table 14 lists the equipment noise levels from Table 7-1 of the *Transit Noise and Vibration Impact Assessment Manual* (Federal Transit Administration 2018) for the applicable Proposed Project equipment from Table 2. All listed noise levels are measured at a reference distance of 50 feet from the equipment (source).

Table 14. Construction Equipment Noise Levels

Equipment	Typical Noise Level at 50 feet from Source (dBA)
Backhoe	80
Dozer	85
Truck	84
Loader	80

Source: Federal Transit Administration 2018

The Proposed Project activities would be limited to the times allowed by the applicable local noise ordinance. Colusa County's ordinance is the most stringent in the Project Area. Colusa County's exemption for daytime construction noise applies when one of the following criteria is met: no individual piece of equipment exceeds 83 dBA at a distance of 25 feet or when the sound level does not exceed 86 dBA at the property plane of the project. Given that the loudest Proposed Project equipment would emit 85 dBA at a distance of 50 feet, the requirement not to exceed 83 dBA at a distance of 25 feet for an individual piece of equipment will be met. The Project Area would experience increases in noise during the proposed investigations, but it would be temporary and limited to daylight hours.

As shown in Table 14, the loudest Proposed Project equipment would emit noise of 85 dBA at 50 feet. For a point source, such as equipment, noise attenuates based on geometry at a rate of 6 dB per doubling of distance. As noted in the *Environmental Setting* above, residences located in the community of Sites are approximately 140 feet from the nearest proposed investigations. At 140 feet, these homes could be exposed to noise levels of up to 77 dBA during the proposed investigations.

Therefore, the Proposed Project would not generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Proposed Project in excess of standards established in the Colusa County noise ordinance. As such, a less-than-significant impact would occur.

b) The proposed investigations are anticipated to be similar in vibration level to general construction activities, but more limited in duration. Table 15 list the equipment vibration levels from Table 7-4 of the *Transit Noise and Vibration Impact Assessment Manual* (Federal Transit Administration [FTA] 2018) for the applicable Proposed Project equipment from Table 2. All listed vibration levels are measured at a reference distance of 25 feet from the equipment (source).

Table 15. Construction Equipment Vibration Levels

Equipment	PPV at 25 feet from Source (in/sec)
Hoe Ram	0.089
Large Bulldozer	0.089
Loaded Trucks	0.076
Small Bulldozer	0.003

Source: FTA 2018

Note: PPV = peak particle velocity in inches per second (in/sec)

As shown in Table 15, the Proposed Project equipment could generate vibration levels of up to 0.089 in/sec at a distance of 25 feet. Vibration generated by equipment spreads through the ground and diminishes in magnitude with increases in distance. As noted in the *Environmental Setting* above, residences located in the community of Sites are approximately 140 feet from the nearest proposed investigations.

The vibration level at the nearest home is calculated using the following formula from the *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018):

$PPV_{equip} = PPV_{ref} X (25/D)^{1.5}$

where:

PPV_{equip} is the peak particle velocity of the equipment adjusted for distance (in/sec),

PPV_{ref} is the source reference vibration level at 25 feet (in/sec), and

D is the distance from the equipment to the receiver (feet).

Using this equation, the vibration level at 140 feet from the equipment would be 0.007 in/sec.

Caltrans has developed guidance for addressing vibration issues associated with construction, operation, and maintenance of transportation projects in the *Transportation and Construction Vibration Guidance Manual* (Caltrans 2020). Caltrans has established criteria for human response to transient vibration and identifies 0.24 in/sec PPV as the level at which vibration is distinctly perceivable by humans (Caltrans 2020). Given that the proposed investigations would generate vibration levels of up to 0.007 in/sec, the Caltrans criteria for human response to transient vibration will be met.

Therefore, the Proposed Project would not generate excessive groundborne vibration, resulting in a less-than-significant impact.

c) There are no private airstrips or airport land use plans within 2 miles of the Proposed Project. Therefore, there is no potential for impacts on such facilities/plans; and this criterion is not discussed further. Therefore, the Proposed Project would not expose people residing or working in the area to excessive noise levels, resulting in no impact.

16.0 Population and Housing

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Induce substantial unplanned population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Environmental Setting

As of January 1, 2022, California's total population was estimated at 39,185,605 (California Department of Finance [DOF] 2022). The Proposed Project would be located within Colusa, Glenn, and Yolo Counties. Table 16 lists the current population within Colusa, Glenn, and Yolo Counties.

Table 16. Current Population of Colusa, Glenn, and Yolo Counties

County	2022 Population
Colusa	21,807
Glenn	28,750
Yolo	221,165
Total	**271,722**

Source: DOF 2022

As shown in Table 16, the combined population of Colusa, Glenn, and Yolo Counties is 271,722. This represents less than 1 percent of the total population of California. As of January 1, 2022, housing units within California were estimated at 14,583,998 (DOF 2022). Table 17 presents the total housing units, occupied units, and persons per household within the three counties.

Table 17. Housing Units in Colusa, Glenn, and Yolo Counties

County	Housing Units	Occupied Units	Persons per Household
Colusa	8,182	7,399	2.92
Glenn	11,020	10,292	2.77
Yolo	81,945	78,308	2.61
Total	**101,147**	**95,999**	**2.76**

Source: DOF 2022

As shown in Table 17, the total housing units within the three counties are 101,147. This represents less than 1 percent of the housing units in California.

The unincorporated community of Sites is in Colusa County and contains approximately 20 houses, 25 barns, and 40 other structures (e.g., sheds, silos, and pumphouses). Colusa County has an estimated 2.92 persons per household (DOF 2022). Based on 2.92 persons per household in Colusa County, approximately 59 people are estimated to be living in Sites.

Impact Analysis

The Proposed Project would not involve construction of any new homes or businesses and it would not result in any unplanned population growth in the Project Area. Activities at a single investigation location would require a maximum of 15 workers (either implementing MM Gen-1 with pre-investigation field surveys or conducting investigations), and the work at any given location would be completed within 1-25 days, depending on the type of activity. The Proposed Project workers would not permanently relocate to the Project Area. Workers are anticipated to commute from the Sites Authority office in Maxwell to the proposed Investigation areas and back. There would be no impact.

b) The Proposed Project would not affect existing residents or housing, cause displacements, or require the construction of new housing elsewhere. Therefore, no impact would occur.

17.0 Public Services

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	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:				
i. Fire Protection?	☐	☐	☐	☒
ii. Police Protection?	☐	☐	☐	☒
iii. Schools?	☐	☐	☐	☒
iv. Parks?	☐	☐	☐	☒
v. Other public facilities?	☐	☐	☐	☒

Environmental Setting

Fire protection services in the Project Area are provided by Maxwell Fire Protection District, Bear Valley/Indian Valley Fire Protection District, Williams Fire Protection Authority, Willows Fire Department/Willows Rural Fire Protection District, and Dunnigan Fire Protection District. Police protection services in the Project Area are provided by the Colusa County Sheriff's Office, Glenn County Sheriff's Office, and Yolo County Sheriff's Office. The California Highway Patrol also provides law enforcement on public roads in the Project Area. There are no schools, parks, or other public facilities within the Project Area.

Impact Analysis

ai) Since the Proposed Project workers would not permanently relocate to the Project Area, the Proposed Project would not cause any population growth in the Project Area. The Proposed Project involves temporary, discrete, and localized investigations, and would not result in an increased demand for fire protection services. The Standard Protocols and Procedures related to fire prevention and suppression at the investigation locations would be implemented as part of the Proposed Project to avoid and minimize fire risk. The Standard Protocol and Procedures related to emergency access would require that access for emergency vehicles on all roadways in the Project Area be maintained for the duration of the proposed investigations. Additionally, equipment and vehicles would be temporarily staged at each designated investigation location

and would not block any access roads. Therefore, there would be no impact on fire protection services.

aii) Since the Proposed Project workers would not permanently relocate to the Project Area, the Proposed Project would not cause any population growth in the Project Area. The Proposed Project involves temporary, discrete, and localized investigations, and would not result in an increased demand for police protection services. The Standard Protocol and Procedures related to emergency access would require that access for emergency vehicles on all roadways in the Project Area be maintained for the duration of the proposed investigations. Additionally, equipment and vehicles would be temporarily staged at each designated investigation location and would not block any access roads. Therefore, there would be no impact on police protection services.

aiii) There are no schools within the Project Area. The Proposed Project would not cause population growth in the Project Area and would not result in an increased demand for schools. Therefore, there would no impact on schools.

aiv) There are no parks within the Project Area. The Proposed Project would not cause population growth in the Project Area and would not result in an increased demand for parks. Therefore, there would no impact on parks.

av) There are no public facilities within the Project Area other than the previously discussed facilities providing fire and police protection services. The Proposed Project would not cause population growth in the Project Area and would not result in an increased demand for public facilities. Therefore, there would no impact on public facilities.

18.0 Recreation

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
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?	☐	☐	☐	☒

Environmental Setting

There are no public recreation facilities or areas within the Project Area. Existing local roads within the Project Area are used by the public for accessing existing reservoirs and the Mendocino National Forest.

Impact Analysis

a) There are no recreational facilities within the Project Area. The Proposed Project would not cause population growth in the Project Area. Therefore, the Proposed Project would not increase the use of existing recreational facilities such that the physical deterioration of recreational facilities would be accelerated, resulting in no impact.

b) The Proposed Project does not include any recreational facilities, and does not require any construction or expansion of recreational facilities. Therefore, no impact would occur.

19.0 Transportation

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☒	☐
b) Conflict with 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?	☐	☐	☐	☒

Environmental Setting

The Project Area for the transportation and traffic analysis consists of roadways and highways providing access to the proposed Investigation locations within Colusa, Glenn, and Yolo Counties. Access roadways for the proposed investigations extend west from I-5 through the Proposed Project Area within the counties of Colusa and Glenn. Access roadways for the proposed investigations extend west from I-5 through the Project Area within the counties of Colusa and Glenn. Access roadways for the Investigation locations along the proposed Dunnigan Pipeline are within Yolo County. Table 18 lists the existing Project Area roadways.

Table 18. Existing Conditions Average Daily Traffic

Roadways and Highways		Year 2019 Average Daily Traffic	Number of Lanes	Roadway Classification	Maximum Daily Volume Threshold
Colusa and Glenn Counties	I-5 north of Glenn-Colusa County line	24,000	4	Interstate	79,200
	I-5 from State Route 20 to Glenn-Colusa County line	26,566	4	Interstate	79,200
	Road 68 west of I-5	230	2	Rural Minor Collector	11,200
	Road D north of Glenn-Colusa County line	481	2	Rural Local Road	5,500
	Road 69 from Road D to end of paved road	25	2	Rural Local Road	5,500
	Delevan Road west of I-5	559	2	Rural Local Road	5,500

Roadways and Highways		Year 2019 Average Daily Traffic	Number of Lanes	Roadway Classification	Maximum Daily Volume Threshold
	McDermott Road north of Maxwell Sites Road	407	2	Rural Local Road	5,500
	Maxwell Sites Road east of McDermott Road	1,617	2	Rural Minor Arterial	15,500
	Maxwell Sites Road/McDermott Road to Sites Lodoga Road	468	2	Rural Minor Arterial	15,500
	Huffmaster Road	No Data	2	Rural Local Road	5,500
	Sites Lodoga Road	468	2	Rural Minor Arterial	15,500
Yolo County	I-5 at Colusa-Yolo County line	31,164	4	Interstate	79,200
	County Road 99W south of County Road 8	No Data	2	Rural Minor Collector	11,200
	County Road 8	No Data	2	Rural Local Road	5,500
	County Road 90B	No Data	2	Rural Local Road	5,500

Impact Analysis

a) The Proposed Project-related vehicle trips would occur on numerous roadways over the course of implementation, between 2023 and 2024. Proposed Project-related trips would be comprised of workers commuting and carpooling to investigation sites daily from the Sites Authority office in Maxwell, which would generally be used as a meeting point for workers, or other population centers in the Project Area, such as, Willows, Orland, and Williams where they would stay during the week to conduct the proposed investigations. Daily worker commute distances to the proposed investigations areas would vary. A representative distance from the Sites Authority office in Maxwell to the proposed investigations within the Antelope Valley of the Project Area is 10 miles.

Each investigation site would be active for a period ranging from 1 day to 25 days, depending on the conditions and investigation type. At any given time, a crew with a maximum of 15 workers could be conducting investigations at a single site and only one crew would be mobilized at a time. With up to 15 workers, there could be approximately 30 total worker trips traveling from the Sites Authority office in Maxwell to the proposed investigation areas and back.

Traffic levels on roadways would temporarily increase during the Proposed Project, particularly before activities start and after they end each day when workers are traveling to and from Investigation locations, resulting in an occasional potential increase in traffic congestion on some roads. The Proposed Project-generated trips would represent less than 1 percent of the average daily traffic volumes on Project Area roadways during the duration of the proposed investigations. Given these estimates it is expected that the roadways providing access to the investigation locations would be minimally affected over the course of the Proposed Project.

No permanent road closures are anticipated to be required; however, temporary and isolated lane closures could occur due to the potential use of equipment such as oversized or overweight vehicles on roadways near investigation. Applicable county, State, and federal regulations, ordinances, and restrictions would be identified and complied with prior to and during implementation. In addition, the contractor would obtain any necessary roadway approvals prior to implementation and comply with applicable conditions of approval. Furthermore, the Standard Protocols and Procedures for Traffic Management and Hazards would be implemented as part of the Proposed Project. These Standard Protocols and Procedures would be implemented to minimize potential road and traffic impacts in the Project Area related to

workers accessing the investigation locations and hauling equipment and materials. Community and landowner outreach would be conducted to minimize traffic impacts during active agricultural periods. The Traffic Management Plan would also be coordinated with Colusa, Glenn, and Yolo Counties, as necessary to minimize traffic impacts.

Therefore, the Proposed Project would not conflict with a program plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities. As a result, this impact would be less than significant.

b) The *Technical Advisory on Evaluating Transportation Impacts in CEQA* published by the Governor's Office of Planning and Research (OPR) in December 2018 provides recommendations regarding vehicle miles traveled evaluation methodology, significance thresholds and screening thresholds for projects. OPR defines screening thresholds for small projects as follows: "Absent substantial evidence indicating that a project would generate a potentially significant level of vehicle miles traveled, or inconsistency with a Sustainable Communities Strategy or general plan, projects that generate or attract fewer than 110 trips per day generally may be assumed to cause a less-than-significant transportation impact" (OPR 2018). The Proposed Project is considered a small project given the nature of the proposed investigations. The Proposed Project is anticipated to generate up to a maximum of 30 daily round trips associated with worker commute to the Project Area (including one 15-person crew for pre-investigation surveys and up to 15 workers conducting investigations if there is overlap between implementing MM Gen-1 and investigations), and up to 5 daily round trips associated with removal of wastewater, solid waste and transport of equipment and materials; thus, the Proposed Project would result in less than 110 trips per days when applying OPR's screening threshold. Therefore, the Proposed Project would not conflict with CEQA Guidelines section 15064.3, subdivision (b), resulting in no impact.

c) The Proposed Project would not change geometric design features or require incompatible uses. The Proposed Project would not result in any alterations to existing public roadways that would affect the safety of or change the compatibility of the public transportation network. Therefore, the Proposed Project would have no impact on hazards due to a geometric design feature or incompatible uses.

d) The Standard Protocols and Procedures for Emergency Access would be implemented as part of the Proposed Project. These Standard Protocols and Procedures would require that access for emergency vehicles on all roadways in the Project Area be maintained for the duration of the proposed investigations. Therefore, the Proposed Project would not result in inadequate emergency access, resulting in no impact.

20.0 Tribal Cultural Resources

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

Environmental Setting

The Project Area is primarily within the ethnographic territory of the Hill and River Patwin and, to a lesser extent, in areas belonging to the Nomlaki. It is at the northern limits of Patwin territory and the southern limits of Nomlaki territory. These peoples settled primarily along streams and rivers and used a broad range of native plants and animals for subsistence, primarily focusing on acorns, fish, and deer. Population density in this region was one of the highest in the state.

The Patwin and Nomlaki are both linguistically classified as part of the Wintuan family of the Penutian language stock. Wintuan is separated linguistically and culturally into three major groups from north to south: the Wintu, Nomlaki, and Patwin.

Today's descendants of the ethnographic Patwin and Nomlaki continue to live in or near the Project Area. They are represented by the Cachil Dehe Band of Wintun Indians (Colusa Indian Community [CIC]), Yocha Dehe Wintun Nation (Yocha Dehe), Kletsel (Cortina) Band of Wintun Indians, Grindstone Indian Rancheria of Wintun-Wailaki Indians, and Paskenta Band of Nomlaki Indians.

Below the Wintu and Nomlaki lands, portions of the Sacramento River were traditionally held by Maiduan-speaking tribes. The Mechoopda Indian Tribe and the Estom Yumeka Maidu Tribe of the

Enterprise Rancheria, both Konkow Maidu Tribes, are close neighbors who have ancestral territory along both sides of the Sacramento River in the southeast corner of Tehama County and the northwest corner of Colusa County. The Konkow Maidu also have ancestral lands that encompass the Feather River below Oroville Dam in Butte County. Konkow Maidu Tribes who lived along the rivers shared many of the same subsistence practices with the Patwin and Nomlaki, as they lived in the same or similar environment.

All of the Native American communities referenced above continue to have strong ties to their ancestral lands and have the potential to identify tribal cultural resources (TCRs) within the Project Area. The Cachil Dehe Band of Wintun Indians adopted a constitution and bylaws on November 23, 1941. At the time, the 80-acre Colusa Rancheria on the Sacramento River in Colusa was home to 45 tribal members. The reservation is now 573 acres and includes the Cachil Dehe Village Complex and Colusa Casino. Along with the casino, agriculture is an important source of tribal revenue and employment; the tribe farms more than 4,000 acres on owned and leased land. The tribe also operates an outdoor adventure enterprise that provides guided hunting and fishing trips (CIC 2019a, 2019b, 2019c). Tribe members preserve their culture with a community-built traditional roundhouse and a language book published in 2004 (CIC 2019a).

The Yocha Dehe occupies part of its historic territory in the Capay Valley in Yolo County (Yocha Dehe 2022a). The tribe today farms more than a dozen crops on 2,200 acres, of which 250 are certified organic; runs more than 400 head of cattle; and has more than 1,200 acres of tribal land in conservation easements (Yocha Dehe 2022b; Yocha Dehe 2015). Other tribal enterprises include the Cache Creek Casino Resort, which is the largest private employer in Yolo County; and Yocha Dehe Golf Club. The tribe also markets its own brand of wine, extra virgin olive oil, wildflower honey, and organic produce; the olive oil mill also serves other regional growers. Yocha Dehe businesses support education, cultural and environmental stewardship, philanthropy, and community service (Yocha Dehe 2015).

This section discusses significance criteria and potential impacts associated with the Proposed Project. A combination of data, published reports, consultation with Native American tribes, and a review of the affected environment in the Project Area was used to evaluate the potential impacts on TCRs that could occur as a result of the proposed investigations.

As enacted by AB 52 and as defined in Section 21074(a) of the Public Resources Code, TCRs are: sites, features, places, cultural landscapes, sacred places, objects with cultural value to a California Native American tribe, and a resource determined to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1. TCRs are further defined under Section 21074(b) and (c) of the PRC.

AB 52 recognized “that California Native American tribes may have expertise with regard to their tribal history and practices, which concern the tribal cultural resources with which they are traditionally and culturally affiliated. “… tribal knowledge about the land and tribal cultural resources at issue should be included in environmental assessments for projects that may have a significant impact on those resources” (AB 52, Section 1[b][4]). Accordingly, AB 52, codified as Public Resources Code (PRC) Section 21084.2, established 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.”

AB 52 (PRC 21080.3.1) directs tribes to request that public agencies notify them of proposed projects in the geographic areas with which they are traditionally or culturally affiliated and give them the opportunity to consult on those projects’ potential impacts to TCRs. CEQA lead agencies that receive such requests must formally notify requesting tribes with project information and an invitation to consult on new projects within 14 days of project initiation. Tribes then have 30 days to respond, and the agency must initiate consultation within 30 days of receiving the request to consult on the project.

Impact Analysis

a, b) For this Proposed Project, the Authority sent AB 52 notification letters (PRC 21080.3.1(d)) to potentially affected Native American tribes identified in Table 19 on August 5, 2022. The Authority will respond to consultation requests within the timeframe prescribed in AB 52, and consultation will be ongoing. A summary of AB 52 consultations, to date, is also provided in Table 19. The tribes listed were identified by the Authority to have a traditional and cultural affiliation with the Project Area.

Table 19. Native American Consultation Under AB52

Tribe	Contact	Notification Letters	Tribal Response as of September 20, 2022	Consultation Actions as of September 20, 2022
Cachil Dehe Band of Wintun Indians of the Colusa Indian Community of the Colusa Rancheria	Mr. Daniel Gomez, Tribal Chairman	Sent August 5, 2022	No response to date	Notification letter sent; receipt of letter verified on August 16, 2022
Cortina Indian Rancheria of Wintun Indians of California	Mr. Charlie Wright, Chair	Sent August 5, 2022	No response to date	Notification letter sent; receipt of letter verified on August 16, 2022
Estom Yumeka Maidu Tribe of the Enterprise Rancheria	Ms. Glenda Nelson, Chairperson	Sent August 5, 2022	No response to date	Notification letter sent; receipt of letter verified on August 8, 2022
Grindstone Indian Rancheria of Wintun-Wailaki Indians of California	Mr. Ronald Kirk, Chairperson	Sent August 5, 2022	No response to date	Notification letter sent; receipt of letter verified on August 9, 2022
Mechoopda Indian Tribe of Chico Rancheria	Mr. Dennis Ramirez, Chairperson	Sent August 5, 2022	No response to date	Notification letter sent; receipt of letter verified on August 8, 2022
Paskenta Band of Nomlaki Indians	Mr. Andrew Alejandre, Chairperson	Sent August 5, 2022	No response to date	Notification letter sent; receipt of letter verified on August 8, 2022
Yocha Dehe Wintun Nation	Mr. Anthony Roberts, Chairperson	Sent August 5, 2022	Letter response dated August 29, 2022	Notification letter sent; receipt of letter verified on August 6, 2022

The Authority will continue to consult with tribes that have a traditional and cultural affiliation with the Project Area throughout the course of the proposed investigations and as requested, in accordance with AB 52. As of September 20, 2022, one tribe, Yocha Dehe Wintun Nation, has formally responded under AB 52.

The Yocha Dehe Wintun Nation, furthermore, noted that they would like to consult on the project during a meeting with the Authority on August 1, 2022. The purpose of the meeting was to review the nature of the locations of Proposed Project investigations and the involvement of the tribe in pre-investigation surveys and monitoring the ground disturbing work. A follow up meeting with the Yocha Dehe Wintun Nation was held on September 15, 2022, to compare GIS data of investigation locations and known Native American resources. While the Yocha Dehe Wintun Nation did not identify any specific tribal cultural resources during the meeting, they did refer to areas of concern and requested access to visit the project locations as soon as possible.

As of this writing, it is anticipated that the Proposed Project would not have a significant impact on any known TCRs. However, without mitigation, the proposed investigations could result in an effect to

unidentified TCRs if they are present in the Project Area. Implementation of MM Gen-1 will require a cultural resource specialist and tribal representative to assess the proposed investigation locations at least one week prior to mobilization during the pre-investigation siting survey. If as a result of the pre-investigation siting survey, the Authority determines, in consultation with the Yocha Dehe Wintun Nation, that the Proposed Project may cause a significant impact to a TCR, and measures are not otherwise identified during the consultation process, the Authority would implement one or more of the following: MM TCR-1, MM TCR-2, and MM TCR-3 (described in Table 20), which are standard measures identified in PRC 21084.3(b) to avoid and reduce potential impacts to TCRs. If the proposed investigations still cannot avoid effects to TCRs after implementation of these mitigation measures, the Authority would implement MM Gen-2. Therefore, through continued AB 52 consultation and implementation of the identified mitigation, impacts on TCRs would be less than significant with mitigation incorporated.

Mitigation

Table 20. Mitigation Measure for Tribal Cultural Resources

Mitigation Measure Title	Description
MM TCR-1: Avoid or Preserve in Place	Avoidance and preservation of the resources in place, including, but not limited to, planning and implementing activities to avoid the resources and protect the cultural and natural context, or planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.
MM TCR-2: Treat Resource with Culturally Appropriate Dignity	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: • Protecting the cultural character and integrity of the resource. • Protecting the traditional use of the resource. • Protecting the confidentiality of the resource.
MM TCR-3: Permanent Conservation Easements	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.

21.0 Utilities and Service Systems

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

Environmental Setting

The Project Area is served by the Glenn-Colusa Irrigation District system and the Tehama-Colusa Canal. The Project Area is supplied with surface water from the Sacramento River and groundwater from both private and municipal wells. Most of the Project Area is rural and has no formal wastewater or stormwater management system. Wastewater in the Project Area is treated using onsite disposal (typically septic systems comprised of a septic tank and leach fields). Stormwater is primarily collected in existing water bodies and carried to the Sacramento River. Electricity providers in the Project Area include Pacific Gas and Electric, Western Area Power Administration, and other municipal utilities. Natural gas in the Project Area is primarily provided by the Pacific Gas and Electric. Cable service (overhead and underground lines), telephone (land lines and cellular service), and internet services are available in the Project Area from a variety of providers such as AT&T, Comcast, Wave Broadband, Vonage, Spectrum, T-Mobile, Frontier, Dish, and Direct TV. The transport and disposal of solid waste in the Project Area is performed by individual public works departments and contracted private waste handling companies in the three counties.

Impact Analysis

a) The Proposed Project would not cause population growth that would require the construction of new or expanded water, wastewater, stormwater drainage, electrical, natural gas, or telecommunications facilities. Therefore, no impact would occur.

b) Implementation of the Proposed Project would not need a water supply, except for dust suppression. The water needed for dust suppression during the proposed investigations would be limited and temporary and would be trucked to the site. The Proposed Project would have no impact on water supplies.

c) The Proposed Project is not anticipated to generate significant quantities of wastewater. All wastewater generated during implementation of the Proposed Project would be hauled off-site and disposed of at an approved facility that is permitted to receive wastewater in the quantities anticipated. Wastewater would not be generated once the investigations are complete. Therefore, there would be no impact on wastewater services.

d) The Proposed Project is not anticipated to generate significant amount of solid waste. All solid waste would be transported to an approved landfill facility with adequate capacity. Solid waste would not be generated once the investigations are complete. Therefore, the Proposed Project would not impair solid waste reduction goals, resulting in no impact.

e) All solid waste generated during implementation of the Proposed Project would be limited and would be transported to an approved landfill facility with adequate capacity. The Proposed Project would comply with federal, state, and local management and reduction statutes and regulations related to solid waste. Therefore, no impact would occur.

22.0 Wildfire

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

Environmental Setting

Wildland fires pose a hazard to rural development, infrastructure, and natural resources throughout the Project Area. Numerous factors, such as topography, vegetation characteristics, fuel load, and climate contribute to the degree of fire hazard, particularly given the area's extremely dry and hot summers. Within the Project Area, dry grasses and vegetation in the summer and early fall months pose a fire hazard. A review of the FHSZ Maps for Colusa, Glenn, and Yolo Counties was conducted to determine wildland fire safety hazards for the Project Area. The Project Area is primarily located in a moderate FHSZ (CAL FIRE 2007a, 2007b, and 2007c). The Proposed Project would occur in a rural, largely undeveloped area with trees, grasses, and shrubs during the summer and fall months, which are generally considered a time of high fire hazard in Northern California.

Impact Analysis

a) The equipment and materials required for the proposed investigations would be transported on local roads, including use of over-sized vehicles. While no road closures are anticipated, some lane closures may be necessary during the Proposed Project implementation period for trucks and equipment to enter the roadways. The Project Area is primarily located in a moderate FHSZ (CAL FIRE 2007a, 2007b, and 2007c). The Standard Protocol and Procedures for Emergency Access would be implemented as part of the Proposed Project and would require that access for emergency vehicles on all roadways in the Project Area be maintained for the duration of the proposed investigations. Therefore, the Proposed Project would not impair an adopted emergency response plan or emergency evacuation plan, resulting in a less-than-significant impact.

b) The vegetation surrounding the Project Area creates a risk of fire hazard from natural hazards (e.g., wind, lightning strikes, etc.) or from human activities. Without appropriate controls, workers traveling to the Investigation locations, and equipment and materials being transported to the locations could increase the risk of fire hazard along their travel route. Operation of vehicles throughout the area, particularly when vegetation adjacent to roads is dry, could increase the fire potential from accidental combustion (e.g., sparks), hot metal (e.g., tail pipes, motors), or traffic accidents. Thus, without appropriate controls, the Proposed Project would increase the risk of fire hazard at those locations due to the presence of worker vehicles and equipment (i.e., combustion engines); the presence of fuels, lubricants, and other flammable substances; and the presence of workers who might smoke onsite.

   The Standard Protocols and Procedures for Fire Prevention and Suppression at the investigation locations would be implemented as part of the Proposed Project to avoid and minimize wildfire risks. These Standard Protocols and Procedures would include proper storage of flammable materials, performing fire prevention and suppression drills daily, keeping firefighting hand tools and equipment on site, and conducting site inspections at the end of each day. Furthermore, a HSSE will be prepared and will include an assessment of known hazards and procedures on how to carry out precautionary methods for fire prevention and suppression. Other measures including prohibiting workers from smoking onsite and pruning vegetation as needed to avoid potential ignition from vehicles and equipment would help reduce wildfire risks. Therefore, the Proposed Project would not expose occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire, resulting in a less-than-significant impact.

c) The Project Area is primarily located in a moderate FHSZ (CAL FIRE 2007a, 2007b, and 2007c). The Proposed Project does not include installation or maintenance of roads, fuel breaks, emergency water sources, power lines or other utilities that could exacerbate fire risk or that

may result in temporary or ongoing impacts to the environment. Therefore, no impact would occur.

d) The Project Area is primarily located in a moderate FHSZ (CAL FIRE 2007a, 2007b, and 2007c). As discussed above, the Standard Protocols and Procedures for Fire Prevention and Suppression at the investigation locations and HSSE Plan would be implemented as part of the Proposed Project to avoid and minimize wildfire risks. The Proposed Project would not expose people or structures to significant risks as result of runoff, post-fire slope instability, or drainage changes. Therefore, no impact would occur.

23.0 Mandatory Findings of Significance

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
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?	☐	☐	☒	☐

Impact Analysis

a) As discussed in Section IV *Biological Resources*, a number of special-status plant and animal species and their habitats are located within the Project Area. The proposed investigations have the potential to disturb these special-status species and their habitats. Mitigation measures MM Gen-1, MM Gen-2, and MM Bio-1 through MM Bio-17 would reduce impacts on special-status species and their habitats to a less-than-significant level. Also, as discussed in Section V *Cultural Resources*, the Proposed Project has the potential to disturb previously unidentified historic

resources, archeological resources, and human remains located in the Project Area. Mitigation measures MM Gen-1, MM Gen-2, and MM Cul-1 through MM Cul-7 would reduce impacts on cultural resources. Section XVIII *Tribal Cultural Resources* describes how the Proposed Project has the potential to disturb previously unidentified TCRs located in the Project Area. Impacts on TCRs would be reduced to a less-than-significant level with implementation of mitigation measures MM Gen-1, MM Gen-2, and MM TCR-1 through MM TCR-3. Overall, as detailed in this analysis, although potential impacts exist as a result of the Proposed Project, these impacts would not substantially degrade the quality of the environment. Therefore, the Proposed Project would have potentially significant impacts on biological and cultural resources, but with mitigation incorporated, impacts would be reduced to a less-than-significant level and there would be no substantial degradation to the natural conditions or cultural environment.

b) All resources analyzed for the Proposed Project were found to either have no impacts, less-than-significant impacts, or less-than-significant impacts with mitigation incorporated under CEQA. In addition, the mitigation measures for the Proposed Project, including MM GEN-2, would ensure that sensitive biological and cultural resources would be avoided during the limited Project implementation activities. Further, the investigation activities under the Proposed Project would be temporary, discrete and localized, in largely remote areas where no other projects would be occurring at the same time or in the same place, such that an aggregation of impacts among different projects is not expected to occur. Finally, although the Maxwell Intertie and South Willows Residential Development projects occur within the Project Area, the would not aggregate or interact with the Proposed Project's effects. As such, the incremental effects of the Proposed Project are not cumulatively considerable when viewed in the connection with the effects of other past, current and reasonably foreseeable future projects. Therefore, the impacts would be less than significant.

c) Due to the isolated, localized, limited, and temporary nature of the proposed investigations, coupled with the extensive mitigation measures to reduce impacts, the Proposed Project would not have a substantial effect on humans, either directly or indirectly. Therefore, a less-than-significant impact would occur.

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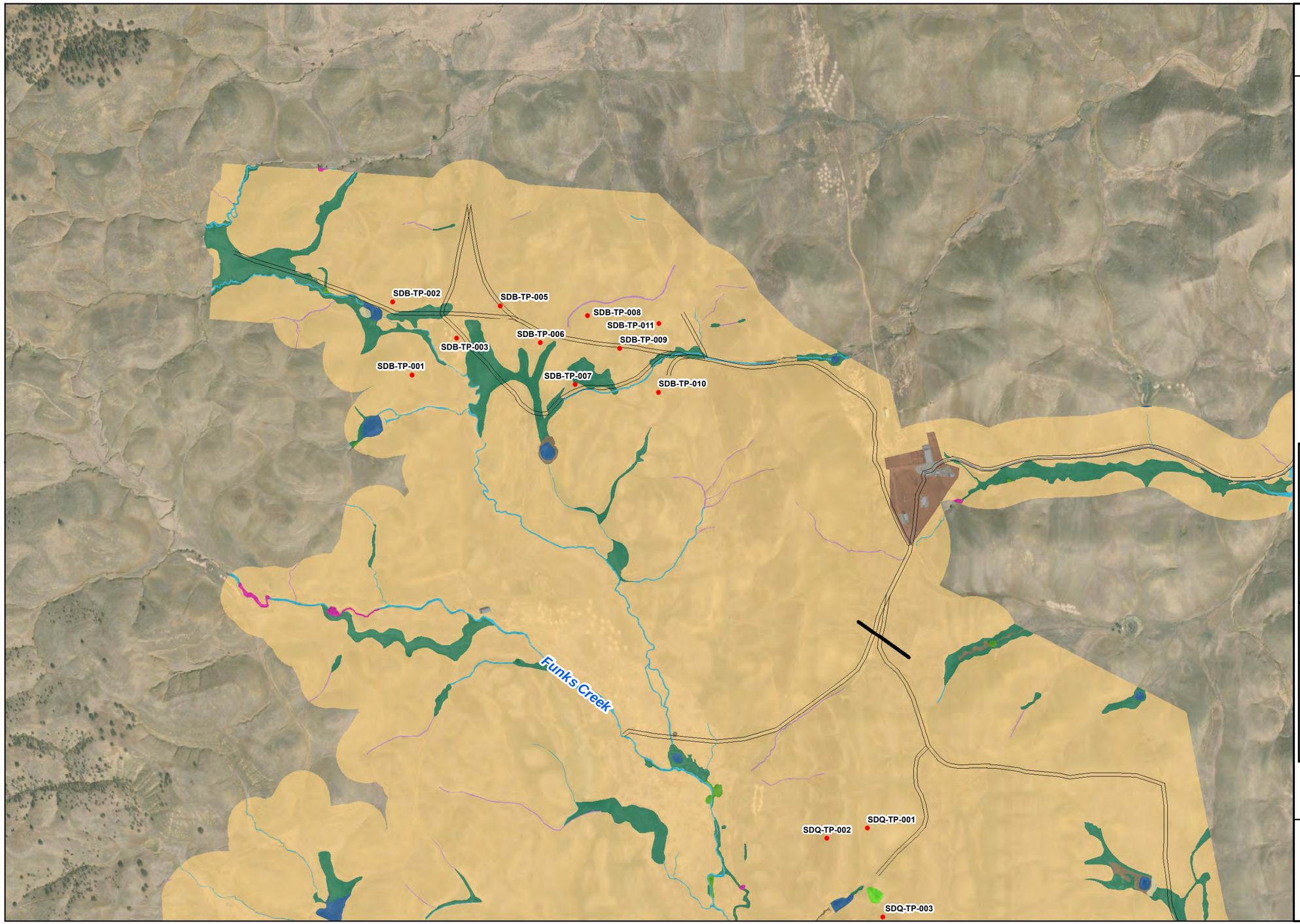
Appendix A. Biological Resources Mapbook and Species Lists and Descriptions

Biological Resources Mapbook
2023 – 2024 Sites Reservoir Test Pits, Fault Studies and Quarry Studies
Page 1 of 9

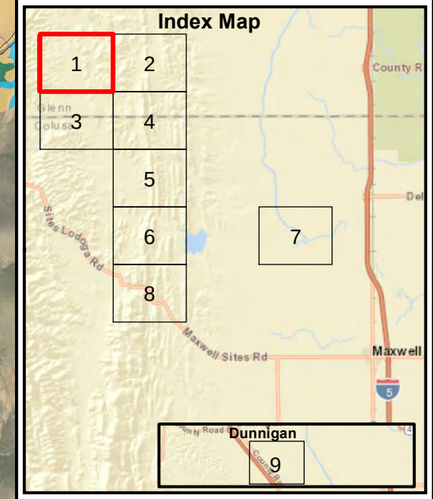


- Existing Road/Path
- Test Pit
- Fault Study

Land Cover

- Annual Grassland
- Developed
- Disturbed
- Ephemeral Stream
- Forested Wetland
- Freshwater Marsh
- Intermittent Stream
- Pond
- Ruderal
- Scrub-Shrub Wetland
- Seasonal Wetland
- Upland Riparian

Note #1: Symbology not to scale.



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Biological Resources Mapbook
2023 – 2024 Sites Reservoir Test Pits, Fault Studies and Quarry Studies
Page 2 of 9

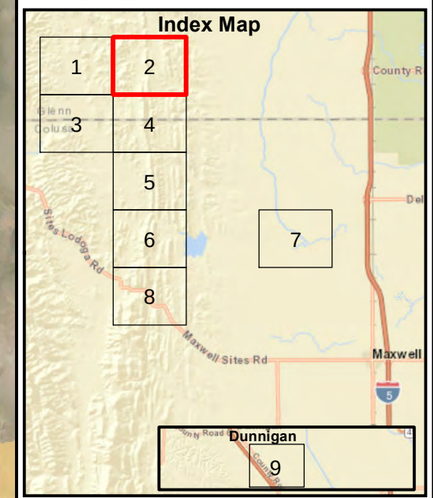
Existing Road/Path

Test Pit

Land Cover

- Annual Grassland
- Developed
- Ephemeral Stream
- Freshwater Marsh
- Intermittent Stream
- Pond
- Ruderal
- Scrub-Shrub Wetland
- Seasonal Wetland
- Upland Riparian

Note #1: Symbology not to scale.



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Biological Resources Mapbook
2023 – 2024 Sites Reservoir Test Pits, Fault Studies and Quarry Studies
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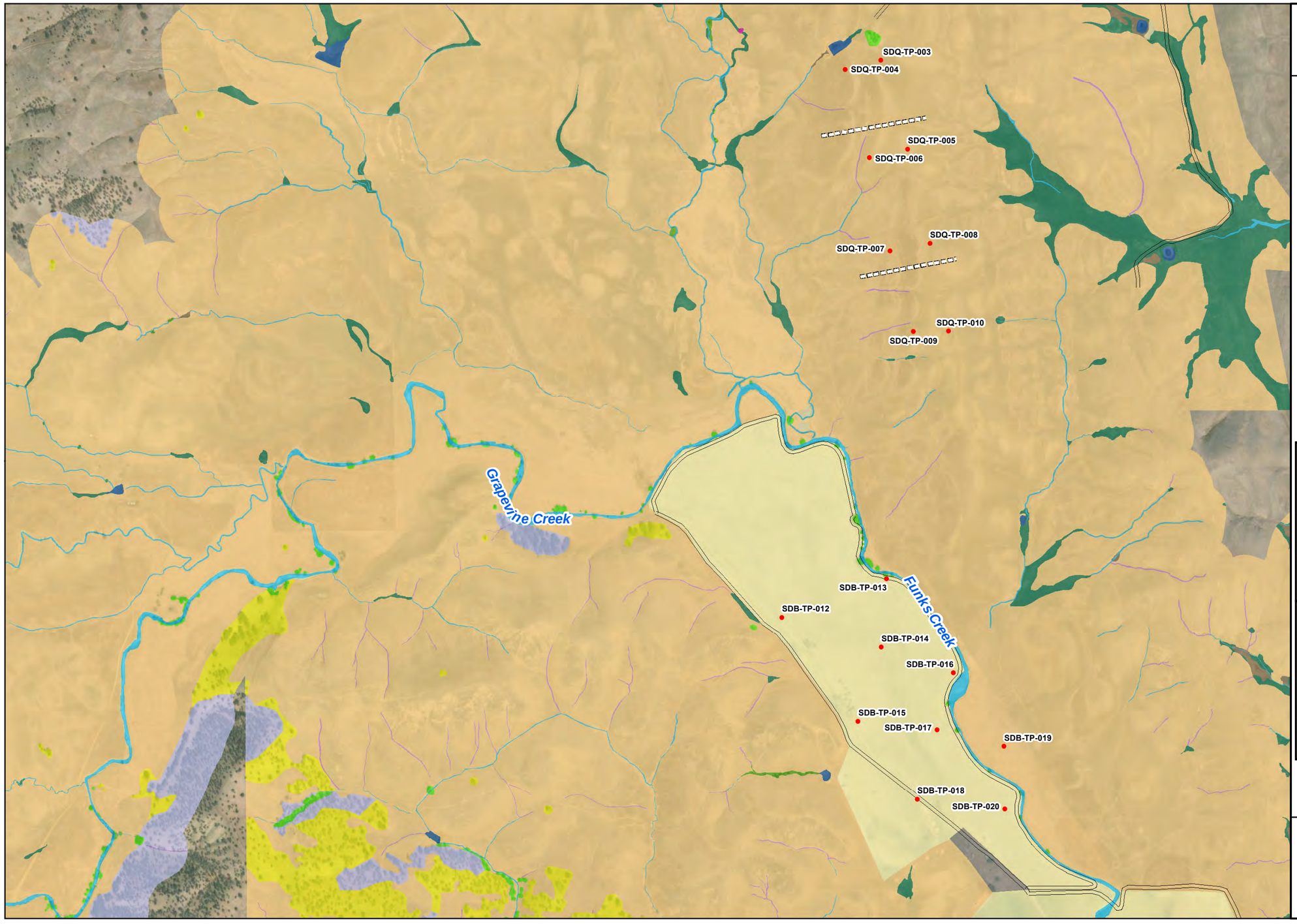
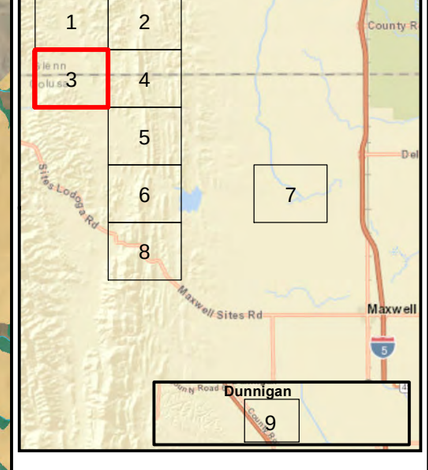


Existing Road/Path
Test Pit
Quarry Study

Land Cover

- Annual Grassland
- Blue Oak Woodland
- Developed
- Ephemeral Stream
- Forested Wetland
- Freshwater Marsh
- Hayfield
- Intermittent Stream
- Oak Savanna
- Pond
- Ruderal
- Scrub-Shrub Wetland
- Seasonal Wetland
- Upland Riparian

Note #1: Symbology not to scale.



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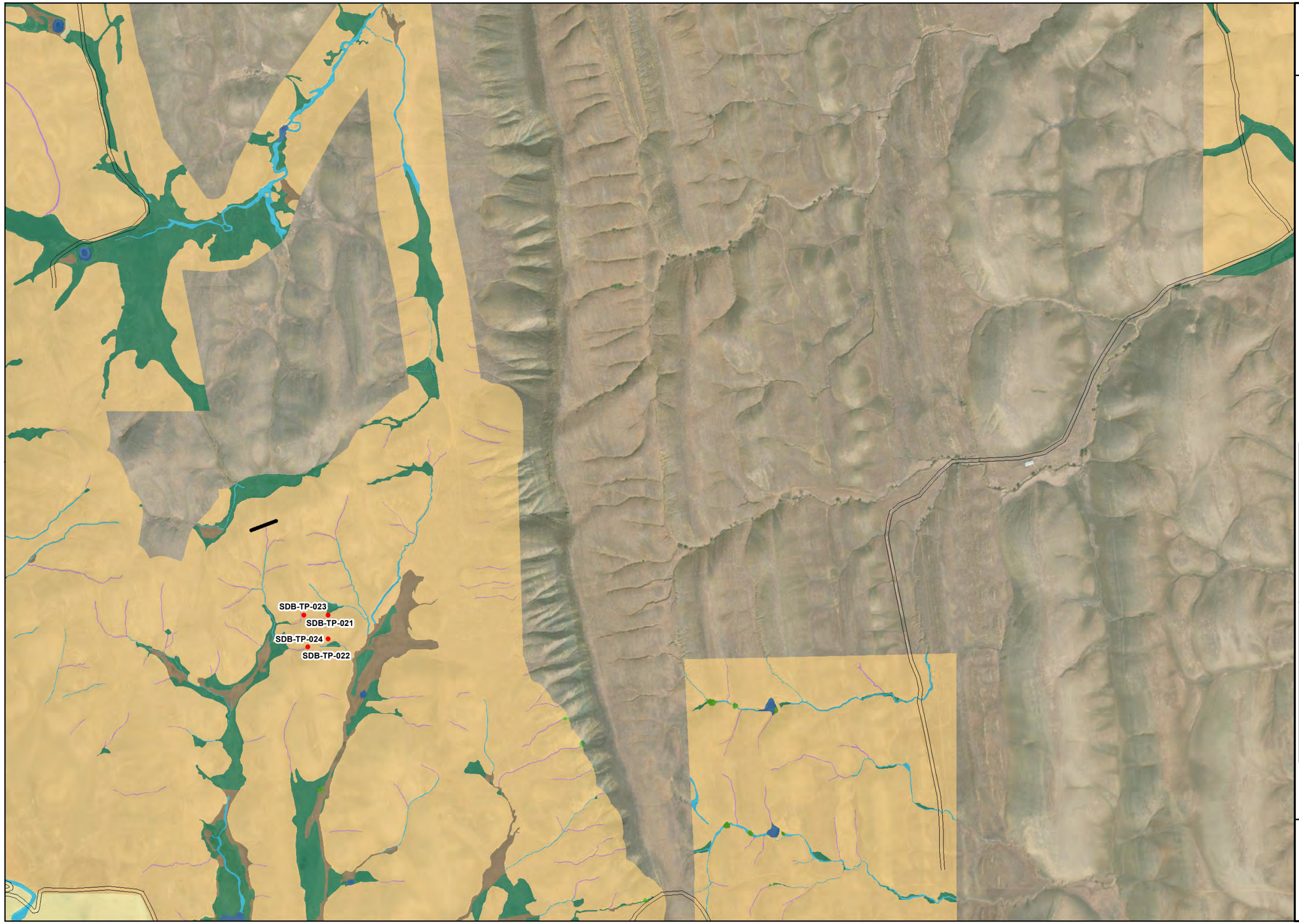


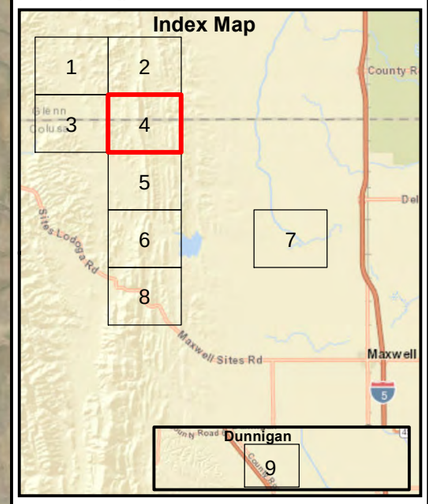
Biological Resources Mapbook
2023 – 2024 Sites Reservoir Test Pits, Fault Studies and Quarry Studies
Page 4 of 9

Existing Road/Path
Test Pit
Fault Study

Land Cover

Annual Grassland
Ephemeral Stream
Freshwater Marsh
Hayfield
Intermittent Stream
Pond
Ruderal
Scrub-Shrub Wetland
Seasonal Wetland
Upland Riparian

Note #1: Symbology not to scale.



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Biological Resources Mapbook
2023 – 2024 Sites Reservoir Test Pits, Fault Studies and Quarry Studies
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GGQ-TP-014
GGQ-TP-015
GGQ-TP-016
GGQ-TP-011
GGQ-TP-012
GGQ-TP-013
GGQ-TP-009
GGQ-TP-008
GGQ-TP-010
GGQ-TP-005
GGQ-TP-007
GGQ-TP-006
GGQ-TP-002
GGQ-TP-003
GGQ-TP-004
Funks Creek
GGB-TP-007

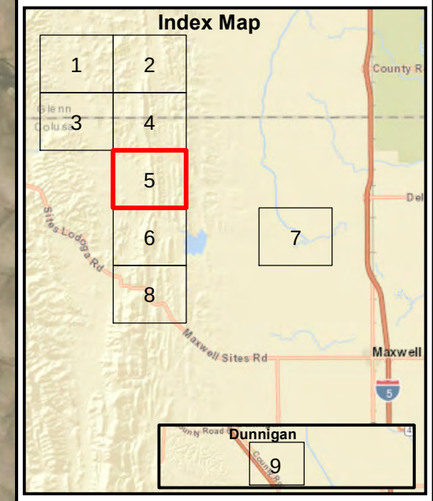
- Existing Road/Path
- Test Pit
- Quarry Study

Land Cover

- Annual Grassland
- Developed
- Ditch
- Ephemeral Stream
- Forested Wetland
- Freshwater Marsh
- Hayfield
- Intermittent Stream
- Oak Savanna
- Pond
- Ruderal
- Scrub-Shrub Wetland
- Seasonal Wetland
- Upland Riparian

Note #1: Symbology not to scale.

Index Map



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Biological Resources Mapbook
2023 – 2024 Sites Reservoir Test Pits, Fault Studies and Quarry Studies
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GGB-TP-007
GGB-TP-012
GGB-TP-013
GGB-TP-014
GGB-TP-016
GGB-TP-019
GGB-TP-018
GGB-TP-021
GGB-TP-022
GGB-TP-023
Funks Creek
FNK-P-003
FNK-P-002
FNK-P-001
Funks Reservoir
SQ-TP-010
SQ-TP-011

- Existing Road/Path
- Test Pit
- Fault Study

Land Cover

- Annual Grassland
- Blue Oak Woodland
- Developed
- Disturbed
- Ditch
- Ephemeral Stream
- Forested Wetland
- Freshwater Marsh
- Intermittent Stream
- Oak Savanna
- Ornamental Woodland
- Pond
- Reservoir
- Scrub-Shrub Wetland
- Seasonal Wetland
- Upland Riparian

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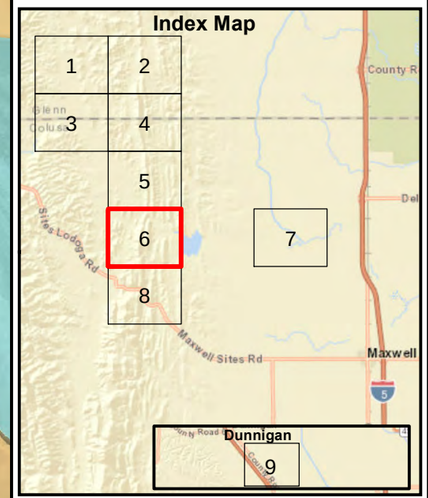

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Biological Resources Mapbook
2023 – 2024 Sites Reservoir Test Pits, Fault Studies and Quarry Studies
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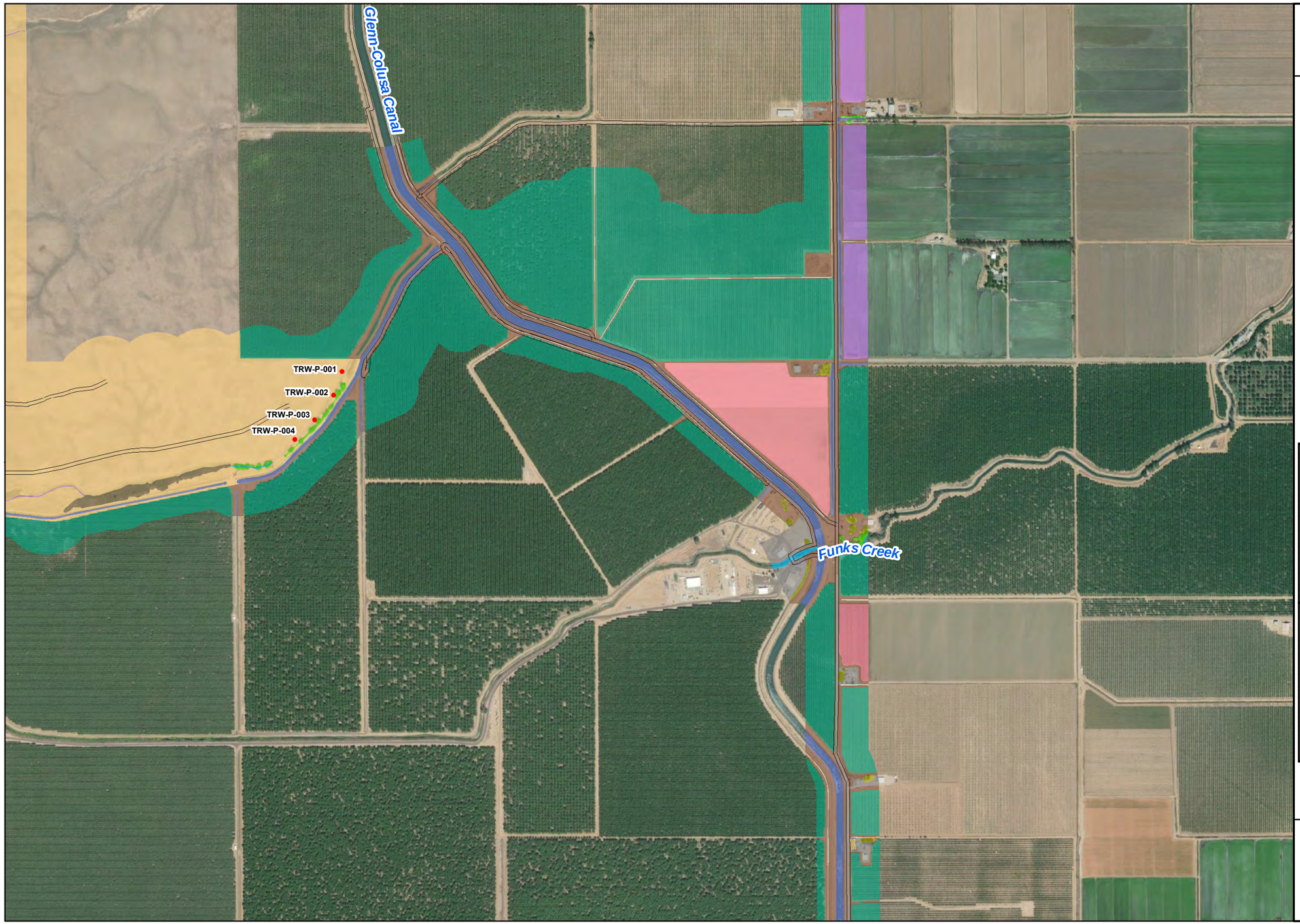

- Existing Road/Path
- Test Pit

Land Cover

- Annual Grassland
- Canal
- Developed
- Disturbed
- Ditch
- Ephemeral Stream
- Freshwater Marsh
- Intermittent Stream
- Orchard
- Ornamental Woodland
- Rice
- Row Crops
- Scrub-Shrub Wetland
- Seasonal Wetland
- Upland Riparian

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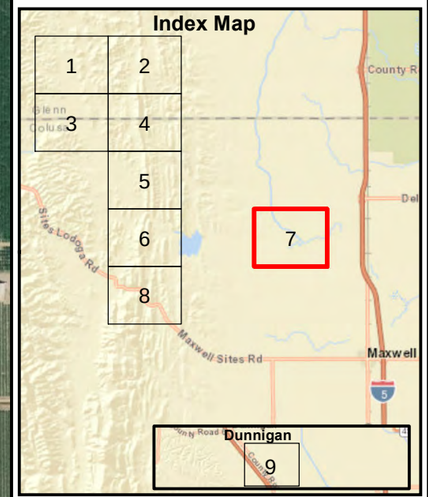

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Biological Resources Mapbook
2023 – 2024 Sites Reservoir Test Pits, Fault Studies and Quarry Studies
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SQ-TP-010
SQ-TP-011
SQ-TP-007
SQ-TP-008
SB-TP-003
Stone Corral Creek
SB-TP-004
SB-TP-005
SQ-TP-003
SQ-TP-005
SQ-TP-004
SB-TP-006
SB-TP-007
SB-TP-008
SB-TP-009
SQ-TP-002
Antelope Creek
SQ-TP-001

Existing Road/Path
Test Pit
Quarry Study
Fault Study

Land Cover

- Annual Grassland
- Blue Oak Woodland
- Developed
- Disturbed
- Ditch
- Ephemeral Stream
- Forested Wetland
- Freshwater Marsh
- Hayfield
- Intermittent Stream
- Oak Savanna
- Ornamental Woodland
- Pond
- Row Crops
- Ruderal
- Scrub-Shrub Wetland
- Seasonal Wetland
- Upland Riparian

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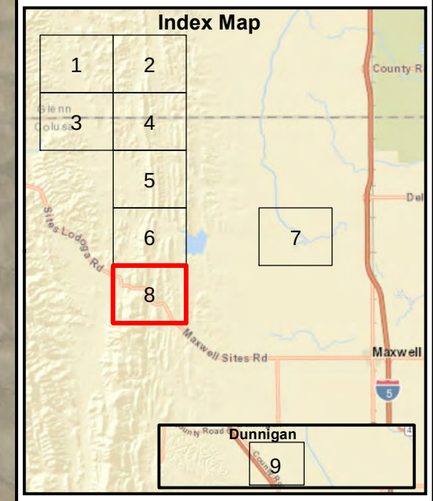

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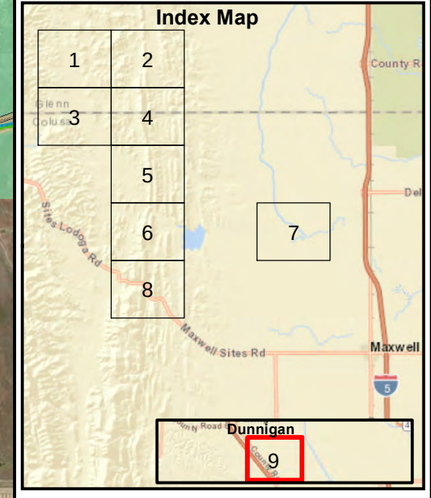
Biological Resources Mapbook
2023 – 2024 Sites Reservoir Test Pits, Fault Studies and Quarry Studies
Page 9 of 9

- Existing Road/Path
- Test Pit

Land Cover

- Annual Grassland
- Developed
- Disturbed
- Ditch
- Intermittent Stream
- Managed Wetland
- Orchard
- Ornamental Woodland
- Pond
- Row Crops
- Ruderal
- Upland Riparian
- Vineyards

Note #1: Symbology not to scale.



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Resource Agency Sensitive Species Lists

CNDDB Query January 2021

Plant Species

Common Name	Scientific Name
adobe-lily	*Fritillaria pluriflora*
Ahart's dwarf rush	*Juncus leiospermus* var. *ahartii*
Ahart's paronychia	*Paronychia ahartii*
Baker's navarretia	*Navarretia leucocephala* ssp. *bakeri*
bent-flowered fiddleneck	*Amsinckia lunaris*
Bolander's horkelia	*Horkelia bolanderi*
Brittlescale	*Atriplex depressa*
California alkali grass	*Puccinellia simplex*
caper-fruited tropidocarpum	*Tropidocarpum capparideum*
Colusa grass	*Neostapfia colusana*
Colusa layia	*Layia septentrionalis*
Coulter's goldfields	*Lasthenia glabrata* ssp. *coulteri*
deep-scarred cryptantha	*Cryptantha excavata*
diamond-petaled California poppy	*Eschscholzia rhombipetala*
dimorphic snapdragon	*Antirrhinum subcordatum*
dwarf downingia	*Downingia pusilla*
Ferris' milk-vetch	*Astragalus tener* var. *ferrisiae*
Greene's tuctoria	*Tuctoria greenei*
hairy Orcutt grass	*Orcuttia pilosa*
heartscale	*Atriplex cordulata* var. *cordulata*
Heckard's pepper-grass	*Lepidium latipes* var. *heckardii*
Hoover's spurge	*Euphorbia hooveri*
Keck's checkerbloom	*Sidalcea keckii*
legenere	*Legenere limosa*
palmate-bracted bird's-beak	*Chloropyron palmatum*
pink creamsacs	*Castilleja rubicundula* var. *rubicundula*
Red Bluff dwarf rush	*Juncus leiospermus* var. *leiospermus*
red-flowered bird's-foot trefoil	*Acmispon rubriflorus*
San Joaquin spearscale	*Extriplex joaquinana*
shining navarretia	*Navarretia nigelliformis* ssp. *radians*
silky cryptantha	*Cryptantha crinita*
vernal pool smallscale	*Atriplex persistens*
water star-grass	*Heteranthera dubia*
woolly rose-mallow	*Hibiscus lasiocarpos* var. *occidentalis*

CNDDB Query January 2021

Wildlife Species

Common Name	Scientific Name
American badger	*Taxidea taxus*
Antioch Dunes anthicid beetle	*Anthicus antiochensis*
bald eagle	*Haliaeetus leucocephalus*
bank swallow	*Riparia riparia*
black-crowned night heron	*Nycticorax nycticorax*
Blennosperma vernal pool andrenid bee	*Andrena blennospermatis*
burrowing owl	*Athene cunicularia*
California linderiella	*Linderiella occidentalis*
California tiger salamander	*Ambystoma californiense*
Conservancy fairy shrimp	*Branchinecta conservatio*
Crotch bumble bee	*Bombus crotchii*
foothill yellow-legged frog	*Rana boylii*
giant gartersnake	*Thamnophis gigas*
great blue heron	*Ardea herodias*
great egret	*Ardea alba*
greater sandhill crane	*Antigone canadensis tabida*
hoary bat	*Lasiurus cinereus*
least Bell's vireo	*Vireo bellii pusillus*
long-eared myotis	*Myotis evotis*
Marysville California kangaroo rat	*Dipodomys californicus eximius*
mountain plover	*Charadrius montanus*
North American porcupine	*Erethizon dorsatum*
osprey	*Pandion haliaetus*
pallid bat	*Antrozous pallidus*
prairie falcon	*Falco mexicanus*
San Joaquin pocket mouse	*Perognathus inornatus*
silver-haired bat	*Lasionycteris noctivagans*
snowy egret	*Egretta thula*
Swainson's hawk	*Buteo swainsoni*
tricolored blackbird	*Agelaius tricolor*
valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*
vernal pool fairy shrimp	*Branchinecta lynchi*
vernal pool tadpole shrimp	*Lepidurus packardi*
western mastiff bat	*Eumops perotis californicus*
western pond turtle	*Emys marmorata*
western red bat	*Lasiurus blossevillii*
western spadefoot	*Spea hammondii*
western yellow-billed cuckoo	*Coccyzus americanus occidentalis*

Common Name	Scientific Name
white-faced ibis	*Plegadis chihi*
white-tailed kite	*Elanus leucurus*
Wilbur Springs minute moss beetle	*Ochthebius recticulus*
yellow warbler	*Setophaga petechia*
yellow-breasted chat	*Icteria virens*
Yuma myotis	*Myotis yumanensis*

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: December 08, 2021
Consultation Code: 08ESMF00-2022-SLI-0533
Event Code: 08ESMF00-2022-E-01574
Project Name: Proposed Sites Reservoir Geotechnical Investigation in Colusa and Glenn Counties, California

Subject: List of threatened and endangered species that may occur in your proposed project location 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: 08ESMF00-2022-SLI-0533
Event Code: Some(08ESMF00-2022-E-01574)
Project Name: Proposed Sites Reservoir Geotechnical Investigation in Colusa and Glenn Counties, California
Project Type: WATER SUPPLY / DELIVERY
Project Description: The Bureau of Reclamation (Reclamation) and the Sites Project Authority (Authority) are proposing additional geotechnical and geophysical investigations in Glenn, Colusa, and Yolo Counties to further inform the design and construction of the proposed Sites Reservoir and its associated facilities in western Sacramento Valley.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@39.32457995,-122.34126694124302,14z

Counties: Colusa, Glenn, and Yolo counties, California

Endangered Species Act Species

There is a total of 18 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.

Birds

NAME	STATUS
Northern Spotted Owl *Strix occidentalis caurina* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/1123	Threatened
Yellow-billed Cuckoo *Coccyzus americanus* Population: Western U.S. DPS There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened

Reptiles

NAME	STATUS
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. The location of the critical habitat is not available. 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. The location of the critical habitat is not available. 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. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/321	Threatened

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate
Valley Elderberry Longhorn Beetle *Desmocerus californicus dimorphus* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/7850	Threatened

Crustaceans

NAME	STATUS
Conservancy Fairy Shrimp *Branchinecta conservatio* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/8246	Endangered
Vernal Pool Fairy Shrimp *Branchinecta lynchi* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/498	Threatened
Vernal Pool Tadpole Shrimp *Lepidurus packardi* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/2246	Endangered

Flowering Plants

NAME	STATUS
Colusa Grass *Neostapfia colusana* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/5690	Threatened
Greene's Tuctoria *Tuctoria greenei* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/1573	Endangered
Hairy Orcutt Grass *Orcuttia pilosa* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/2262	Endangered
Hoover's Spurge *Chamaesyce hooveri* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/3019	Threatened
Keck's Checker-mallow *Sidalcea keckii* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/5704	Endangered
Palmate-bracted Bird's Beak *Cordylanthus palmatus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1616	Endangered
Slender Orcutt Grass *Orcuttia tenuis* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/1063	Threatened

Critical habitats

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

CNPS California Native Plant Society

Inventory of Rare and Endangered Plants

*The database used to provide updates to the Online Inventory is under construction. View updates and changes made since May 2019 here.

Plant List

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

Search Criteria

Found in Quads 4012242, 4012232, 4012222, 4012212, 4012223, 4012213, 4012214, 4012221, 4012211, 4012127, 3812271, 3812188, 3812177, 3812178, 3812281, 3812187, 3912117, 3912127, 3912128, 3912126, 3912273, 3912271, 3912272, 3912263, 3912262, 3912261, 3912252, 3912251, 3912242, 3912253, 3912241, 3912231, 3912232, 3912233, 3912244, 3912234, 3912224, 3912223, 3912222, 3912168, 3912178 3912116 and 3812176;

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
Acmispon rubriflorus	red-flowered bird's-foot trefoil	Fabaceae	annual herb	Apr-Jun	1B.1	S2	G2
Agrostis hendersonii	Henderson's bent grass	Poaceae	annual herb	Apr-Jun	3.2	S2	G2Q
Allium sanbornii var. sanbornii	Sanborn's onion	Alliaceae	perennial bulbiferous herb	May-Sep	4.2	S3S4	G4T3T4
Amsinckia lunaris	bent-flowered fiddleneck	Boraginaceae	annual herb	Mar-Jun	1B.2	S3	G3
Androsace elongata ssp. acuta	California androsace	Primulaceae	annual herb	Mar-Jun	4.2	S3S4	G5? T3T4
Antirrhinum subcordatum	dimorphic snapdragon	Plantaginaceae	annual herb	Apr-Jul	4.3	S3	G3
Astragalus breweri	Brewer's milk-vetch	Fabaceae	annual herb	Apr-Jun	4.2	S3	G3
Astragalus clevelandii	Cleveland's milk-vetch	Fabaceae	perennial herb	Jun-Sep	4.3	S4	G4
Astragalus pauperculus	depauperate milk-vetch	Fabaceae	annual herb	Mar-Jun	4.3	S4	G4
Astragalus rattanii var. jepsonianus	Jepson's milk-vetch	Fabaceae	annual herb	Mar-Jun	1B.2	S3	G4T3
	Ferris' milk-vetch	Fabaceae	annual herb	Apr-May	1B.1	S1	G2T1

Astragalus tener var. ferrisiae							
Atriplex cordulata var. cordulata	heartscale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G3T2
Atriplex depressa	brittlescale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G2
Atriplex persistens	vernal pool smallscale	Chenopodiaceae	annual herb	Jun,Aug,Sep,Oct	1B.2	S2	G2
Azolla microphylla	Mexican mosquito fern	Azollaceae	annual / perennial herb	Aug	4.2	S4	G5
Balsamorhiza macrolepis	big-scale balsamroot	Asteraceae	perennial herb	Mar-Jun	1B.2	S2	G2
Brasenia schreberi	watershield	Cabombaceae	perennial rhizomatous herb (aquatic)	Jun-Sep	2B.3	S3	G5
Brodiaea rosea ssp. rosea	Indian Valley brodiaea	Themidaceae	perennial bulbiferous herb	May-Jun	3.1	S2	G2
Brodiaea rosea ssp. vallicola	valley brodiaea	Themidaceae	perennial bulbiferous herb	Apr-May(Jun)	4.2	S3	G5T3
Calystegia collina ssp. oxyphylla	Mt. Saint Helena morning-glory	Convolvulaceae	perennial rhizomatous herb	Apr-Jun	4.2	S3	G4T3
Calystegia collina ssp. tridactylosa	three-fingered morning-glory	Convolvulaceae	perennial rhizomatous herb	Apr-Jun	1B.2	S1	G4T1
Castilleja rubicundula var. rubicundula	pink creamsacs	Orobanchaceae	annual herb (hemiparasitic)	Apr-Jun	1B.2	S2	G5T2
Centromadia parryi ssp. rudis	Parry's rough tarplant	Asteraceae	annual herb	May-Oct	4.2	S3	G3T3
Chloropyron palmatum	palmate-bracted bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	May-Oct	1B.1	S1	G1
Chorizanthe spinosa	Mojave spineflower	Polygonaceae	annual herb	Mar-Jul	4.2	S4	G4
Clarkia gracilis ssp. tracyi	Tracy's clarkia	Onagraceae	annual herb	Apr-Jul	4.2	S3	G5T3
Collomia diversifolia	serpentine collomia	Polemoniaceae	annual herb	May-Jun	4.3	S4	G4
Cryptantha crinita	silky cryptantha	Boraginaceae	annual herb	Apr-May	1B.2	S2	G2
Cryptantha dissita	serpentine cryptantha	Boraginaceae	annual herb	Apr-Jun	1B.2	S2	G2
Cryptantha excavata	deep-scarred cryptantha	Boraginaceae	annual herb	Apr-May	1B.1	S1	G1
Cryptantha rostellata	red-stemmed cryptantha	Boraginaceae	annual herb	Apr-Jun	4.2	S3	G4
Cymopterus deserticola	desert cymopterus	Apiaceae	perennial herb	Mar-May	1B.2	S2	G2
Cypripedium montanum	mountain lady's-slipper	Orchidaceae	perennial rhizomatous herb	Mar-Aug	4.2	S4	G4

Delphinium uliginosum	swamp larkspur	Ranunculaceae	perennial herb	May-Jun	4.2	S3	G3
Downingia pusilla	dwarf downingia	Campanulaceae	annual herb	Mar-May	2B.2	S2	GU
Eriastrum tracyi	Tracy's eriastrum	Polemoniaceae	annual herb	May-Jul	3.2	S3	G3Q
Eriogonum nervulosum	Snow Mountain buckwheat	Polygonaceae	perennial rhizomatous herb	Jun-Sep	1B.2	S2	G2
Erythranthe glaucescens	shield-bracted monkeyflower	Phrymaceae	annual herb	Feb-Aug(Sep)	4.3	S3S4	G3G4
Eschscholzia rhombipetala	diamond-petaled California poppy	Papaveraceae	annual herb	Mar-Apr	1B.1	S1	G1
Euphorbia hooveri	Hoover's spurge	Euphorbiaceae	annual herb	Jul-Sep(Oct)	1B.2	S1	G1
Euphorbia ocellata ssp. rattanii	Stony Creek spurge	Euphorbiaceae	annual herb	May-Oct	1B.2	S2?	G4T2?
Extriplex joaquinana	San Joaquin spearscale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G2
Fritillaria eastwoodiae	Butte County fritillary	Liliaceae	perennial bulbiferous herb	Mar-Jun	3.2	S3	G3Q
Fritillaria pluriflora	adobe-lily	Liliaceae	perennial bulbiferous herb	Feb-Apr	1B.2	S2S3	G2G3
Gratiola heterosepala	Boggs Lake hedge-hyssop	Plantaginaceae	annual herb	Apr-Aug	1B.2	S2	G2
Harmonia hallii	Hall's harmonia	Asteraceae	annual herb	Apr-Jun	1B.2	S2?	G2?
Hesperevax caulescens	hogwallow starfish	Asteraceae	annual herb	Mar-Jun	4.2	S3	G3
Hesperolinon drymarioides	drymaria-like western flax	Linaceae	annual herb	May-Aug	1B.2	S2	G2
Heteranthera dubia	water star-grass	Pontederiaceae	perennial herb (aquatic)	Jul-Oct	2B.2	S2	G5
Hibiscus lasiocarpos var. occidentalis	woolly rose-mallow	Malvaceae	perennial rhizomatous herb (emergent)	Jun-Sep	1B.2	S3	G5T3
Juncus leiospermus var. ahartii	Ahart's dwarf rush	Juncaceae	annual herb	Mar-May	1B.2	S1	G2T1
Juncus leiospermus var. leiospermus	Red Bluff dwarf rush	Juncaceae	annual herb	Mar-Jun	1B.1	S2	G2T2
Lasthenia glabrata ssp. coulteri	Coulter's goldfields	Asteraceae	annual herb	Feb-Jun	1B.1	S2	G4T2
Layia septentrionalis	Colusa layia	Asteraceae	annual herb	Apr-May	1B.2	S2	G2
Legenere limosa	legenere	Campanulaceae	annual herb	Apr-Jun	1B.1	S2	G2
Lepidium latipes var. heckardii	Heckard's pepper-grass	Brassicaceae	annual herb	Mar-May	1B.2	S1	G4T1
Limnanthes floccosa ssp. californica	Butte County meadowfoam	Limnanthaceae	annual herb	Mar-May	1B.1	S1	G4T1

Limnanthes floccosa ssp. floccosa	woolly meadowfoam	Limnanthaceae	annual herb	Mar-May(Jun)	4.2	S3	G4T4
Lupinus milo-bakeri	Milo Baker's lupine	Fabaceae	annual herb	Jun-Sep	1B.1	S1	G1Q
Lupinus sericatus	Cobb Mountain lupine	Fabaceae	perennial herb	Mar-Jun	1B.2	S2?	G2?
Malacothamnus helleri	Heller's bush-mallow	Malvaceae	perennial deciduous shrub	May-Jul	3.3	S3	G3Q
Myosurus minimus ssp. apus	little mousetail	Ranunculaceae	annual herb	Mar-Jun	3.1	S2	G5T2Q
Navarretia heterandra	Tehama navarretia	Polemoniaceae	annual herb	Apr-Jun	4.3	S4	G4
Navarretia leucocephala ssp. bakeri	Baker's navarretia	Polemoniaceae	annual herb	Apr-Jul	1B.1	S2	G4T2
Navarretia nigelliformis ssp. nigelliformis	adobe navarretia	Polemoniaceae	annual herb	Apr-Jun	4.2	S3	G4T3
Navarretia nigelliformis ssp. radians	shining navarretia	Polemoniaceae	annual herb	(Mar)Apr-Jul	1B.2	S2	G4T2
Navarretia paradoxinota	Porter's navarretia	Polemoniaceae	annual herb	May-Jun(Jul)	1B.3	S2	G2
Navarretia subuligera	awl-leaved navarretia	Polemoniaceae	annual herb	Apr-Aug	4.3	S4	G4
Neostapfia colusana	Colusa grass	Poaceae	annual herb	May-Aug	1B.1	S1	G1
Orcuttia pilosa	hairy Orcutt grass	Poaceae	annual herb	May-Sep	1B.1	S1	G1
Orcuttia tenuis	slender Orcutt grass	Poaceae	annual herb	May-Sep(Oct)	1B.1	S2	G2
Paronychia ahartii	Ahart's paronychia	Caryophyllaceae	annual herb	Feb-Jun	1B.1	S3	G3
Polygonum bidwelliae	Bidwell's knotweed	Polygonaceae	annual herb	Apr-Jul	4.3	S4	G4
Puccinellia simplex	California alkali grass	Poaceae	annual herb	Mar-May	1B.2	S2	G3
Sagittaria sanfordii	Sanford's arrowhead	Alismataceae	perennial rhizomatous herb (emergent)	May-Oct(Nov)	1B.2	S3	G3
Senecio clevelandii var. clevelandii	Cleveland's ragwort	Asteraceae	perennial herb	Jun-Jul	4.3	S3	G4?T3Q
Sidalcea celata	Redding checkerbloom	Malvaceae	perennial herb	Apr-Aug	3	S2S3	G2G3
Sidalcea keckii	Keck's checkerbloom	Malvaceae	annual herb	Apr-May(Jun)	1B.1	S2	G2
		Brassicaceae	annual herb	Apr-Jun	4.3	S4	G4

Streptanthus drepanoides	sickle-fruit jewelflower						
Symphyotrichum lentum	Suisun Marsh aster	Asteraceae	perennial rhizomatous herb	(Apr)May-Nov	1B.2	S2	G2
Trichocoronis wrightii var. wrightii	Wright's trichocoronis	Asteraceae	annual herb	May-Sep	2B.1	S1	G4T3
Tropidocarpum capparideum	caper-fruited tropidocarpum	Brassicaceae	annual herb	Mar-Apr	1B.1	S1	G1
Tuctoria greenei	Greene's tuctoria	Poaceae	annual herb	May-Jul(Sep)	1B.1	S1	G1
Wolffia brasiliensis	Brazilian watermeal	Araceae	perennial herb (aquatic)	Apr,Dec	2B.3	S2	G5

Suggested Citation

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The Jepson Flora Project
The Consortium of California Herbaria
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Questions and Comments
rareplants@cnps.org

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National Marine Fisheries Service Species List

Quad Name	Logan Ridge	Rail Canyon	Lodoga	Moulton Weir	Maxwell	Sites
Quad Number	39122- D3	39122- D4	39122- C4	39122-C1	39122-C2	39122- C3
ESA Anadromous Fish						
SONCC Coho ESU (T) -						
CCC Coho ESU (E) -						
CC Chinook Salmon ESU (T) -						
CVSR Chinook Salmon ESU (T) -				X	X	X
SRWR Chinook Salmon ESU (E) -				X	X	X
NC Steelhead DPS (T) -						
CCC Steelhead DPS (T) -						
SCCC Steelhead DPS (T) -						
SC Steelhead DPS (E) -						
CCV Steelhead DPS (T) -				X	X	X
Eulachon (T) -						
sDPS Green Sturgeon (T) -				X		
ESA Anadromous Fish Critical Habitat						
SONCC Coho Critical Habitat -						
CCC Coho Critical Habitat -						
CC Chinook Salmon Critical Habitat -						
CVSR Chinook Salmon Critical Habitat -				X		
SRWR Chinook Salmon Critical Habitat -				X		
NC Steelhead Critical Habitat -						
CCC Steelhead Critical Habitat -						
SCCC Steelhead Critical Habitat -						
SC Steelhead Critical Habitat -						
CCV Steelhead Critical Habitat -				X		
Eulachon Critical Habitat -						
sDPS Green Sturgeon Critical Habitat -				X		
ESA Marine Invertebrates						
Range Black Abalone (E) -						
Range White Abalone (E) -						
ESA Marine Invertebrates Critical Habitat						
Black Abalone Critical Habitat -						
ESA Sea Turtles						
East Pacific Green Sea Turtle (T) -						
Olive Ridley Sea Turtle (T/E) -						
Leatherback Sea Turtle (E) -						
North Pacific Loggerhead Sea Turtle (E) -						
ESA Whales						
Blue Whale (E) -						
Fin Whale (E) -						
Humpback Whale (E) -						
Southern Resident Killer Whale (E) -						
North Pacific Right Whale (E) -						
Sei Whale (E) -						
Sperm Whale (E) -						
ESA Pinnipeds						
Guadalupe Fur Seal (T) -						
Steller Sea Lion Critical Habitat -						
Essential Fish Habitat						
Coho EFH -						
Chinook Salmon EFH -	X	X	X	X	X	X
Groundfish EFH -						
Coastal Pelagics EFH -						
Highly Migratory Species EFH -						
MMPA Species (See list at left)						
ESA and MMPA Cetaceans/Pinnipeds						
See list at left and consult the NMFS Long Beach office						
562-980-4000						
MMPA Cetaceans -						
MMPA Pinnipeds -						

Habitat Types and Sensitive Resources Descriptions and Potential for Occurrence

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Existing Conditions

Introduction

This chapter provides a summary of the existing conditions for biological resources in the study area. The work areas have been established according to the Standard Protocols and Procedures and Mitigation Measures Tracking Program identified in Appendix B of the EA/IS. The Standard Protocols and Procedures provide for a process for siting work areas to avoid and minimize effects on sensitive biological resources. Therefore, almost all of the biological resources discussed in this chapter do not occur in the work areas. The resources are discussed to provide context for the analysis and to help explain the efforts to avoid and minimize effects on these resources.

Methodology

To identify the biological resources in the study area, ICF reviewed previous survey results from work conducted by the California Department of Fish and Game and the California Department of Water Resources from 1998 to 2004 (CDFG, 2003a, 2003b; DWR, 2000a; Authority and Reclamation, 2021. ICF also queried several databases for information on species, including the California Natural Diversity Database (CNDDB) (California Department of Fish and Wildlife [CDFW], 2021), the California Native Plant Society Inventory of Rare and Endangered Plants (2020), the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation species list (USFWS, 2021), and the National Marine Fisheries Service (NMFS) species list (National Marine Fisheries Service, 2021). These lists are included as Attachment D-1. ICF mapped land cover in and adjacent to the proposed investigation work areas through aerial photo interpretation using Google Earth and National Agricultural Imagery Program imagery and topographic data. Attachment D-2 provides a biological resources mapbook depicting the proposed investigations and habitats within the Project Area.

Natural Communities

This section describes the natural communities that are in and adjacent to the study area. Some natural communities described below occur adjacent to the defined study area in order to consider potential effects on nesting birds associated with the geotechnical and geophysical activities. There are five terrestrial natural communities, four aquatic natural communities, and areas of cropland in and adjacent to the study area. The characteristic plant species present in each natural community are described below. The special-status plant and animal species that have a potential to occur in these communities are presented in *Special-Status Species*.

Annual Grassland

The primary vegetation type in the study area is grassland. Grassland consists of open areas lacking woody vegetation and is characterized by herbaceous vegetation dominated by grasses, although flowering forbs are often a conspicuous component of the plant cover. In the study area, this vegetation type is best classified as annual grassland, because the dominant species are annual grasses introduced from the Mediterranean Basin, such as bromes (*Bromus* spp.) wild oats (*Avena* spp.), barleys (*Hordeum* spp.), and ryegrass (*Festuca perenne*). Annual grassland in the study area is highly diverse and contains

multiple microhabitats, including vernal pools and swales, clay flats, alkaline grassland, alkaline wetland, talus slopes, bunchgrass (*Stipa* spp.) stands, and wildflower fields. Although much of the vegetation cover is composed of nonnative annual grasses, many species of native grasses and forbs are present, and the microhabitats scattered throughout the grassland support special-status plants. Some areas are dominated by invasive plant species, such as yellow star-thistle (*Centaurea solstitialis*).

Oak Woodlands

Oak woodland is also prevalent in the study area, occurring mostly in the western portion in Colusa County. Dominant species include a mix of oak species (*Quercus* spp.) including coast live oak (*Q. agrifolia*), blue oak (*Q. douglasii*), and valley oak (*Q. lobata*). Much of the understory is dominated by annual grasses including bromes, barleys, and ryegrasses as well as wildflower fields. Much of the oak woodland areas are vast and undisturbed located on gently rolling hillsides adjacent to the valley floor.

Riparian Forest, Woodland, and Scrub

Riparian vegetation is found intermittently throughout and adjacent to the study area, generally occurring as narrow strips along streams, and as tree-lined canals Riparian vegetation occurs along Funks Creek, Stone Corral Creek, Antelope Creek, Bird Creek, and other smaller unnamed streams. Dominant tree species in the riparian forest and woodland include Fremont cottonwood (*Populus fremontii*) and willows (*Salix gooddingii, S. laevigata*). Valley oaks are occasionally present. Riparian scrub is dominated by shrubby willows (*S. exigua* and others). The understory of this vegetation type contains various shrub, vine, and herbaceous species. Several nonnative tree species are also present, such as walnuts (*Juglans* spp.), fig (*Ficus carica*), and tree-of-heaven (*Ailanthus altissima*). Most of the patches of riparian habitat within the non-cropland study areas are small, sparse, and degraded by intensive cattle use.

Cropland

Vegetation in the east side of the study area and adjacent to the proposed Dunnigan Pipeline and associated facilities consists primarily of cropland. Cropland encompasses all areas where the native vegetation has been cleared for agriculture, including rice fields, orchards, and row crops. Within the cropland vegetation type, small patches of ruderal (repeatedly disturbed) habitat are present adjacent to the cultivated fields, roads, levees, and other infrastructure.

Freshwater Marsh

Freshwater marsh consists of wetlands dominated by emergent, perennial herbaceous species. In the study area, the dominant species are cattails (*Typha* spp.) and rushes (*Schoenoplectus* spp.), but sedges (*Carex* spp.), spikerushes (*Eleocharis* spp.), and shrubby willows are sometimes present. Small patches of freshwater marsh associated with riparian areas, ponds, and ditches are scattered throughout the study area.

Seasonal Wetland

Seasonal wetlands are scattered throughout the annual grasslands in the study area. Seasonal wetlands are inundated by surface water or saturated by groundwater during the winter and spring months. Most of these seasonal wetlands are dry by early summer, and in the study area they are strongly associated with low-lying areas of clay or clay loam soils. Many of the plants found in these wetlands are dry and brown during the summer months, making the wetlands almost indistinguishable from the surrounding annual grasslands. Seasonal wetlands include vernal pools, alkaline wetlands, vernal swales, clay flats, and other

wetlands that have formed because of human activities (e.g., drainages blocked by roads or disturbed areas within heavy clay soils). Dominant plant species include spike rush (*Eleocharis macrostachya*), Mediterranean barley (*Hordeum marinum* subsp, *gussoneanum*), and dock (*Rumex* ssp.).

Many of the vernal pools found within the study area have very low plant species diversity (DWR, 2000a). Pools at the northeastern edge of the study area tend to be larger and have greater plant species diversity. Species typically associated with vernal pools include coyote thistle (*Eryngium castrense*), popcorn flower (*Plagiobothrys* ssp.), and hyssop loosestrife (*Lythrum hyssopifolium*).

Most of the alkaline wetlands in the general study area are also seasonal but are vastly different in plant species composition from vernal pools and other freshwater seasonal wetlands (DWR, 2000a). The annual and perennial species in these areas are tolerant of alkali conditions. Most of these wetlands are dominated by salt grass (*Distichlis spicata*), with various other species including sickle grass (*Parapholis incurva*), alkali heath (*Frankenia salina*), alkali weed (*Cressa truxillensis*), and salt marsh bulrush (*Scirpus maritimus*).

Pond

Ponds in the study area are small reservoirs constructed by placing dams on ephemeral streams to capture and store runoff for livestock use. These ponds are mostly unvegetated, although freshwater marsh is infrequently found at the edges of some ponds. These ponds support almost no native flora, and most of the plants are invasive aquatic species (Authority and Reclamation, 2021). Species typical of this habitat include common cocklebur (*Xanthium strumarium*) and dock species.

Reservoir

Funks Reservoir

Funks Reservoir is located on Funks Creek approximately 7 miles northwest of the town of Maxwell, in Colusa County. Constructed in 1975 by the Bureau of Reclamation (Reclamation), Funks Reservoir is a reregulating reservoir that balances water level operations of the Tehama-Colusa Canal (TCC) upstream and downstream of Funks Creek. It has a designed storage capacity of approximately 2,200 acre-feet and a surface area of 232 acres. The typical summer releases from Funks Reservoir to the lower portions of TCC range from 500 cubic feet per second (cfs) to 1,000 cfs. Total flows of 50 cfs to 200 cfs for off-peak limited agricultural releases are needed from November to February, and sometimes into March, depending on the weather (DWR 2003).

Funks Reservoir is bounded primarily by annual grasslands composed of mostly weedy nonnative species. Very few trees or wetlands occur along the water's edge. Seasonal wetlands occur along drainages above the reservoir water's edge (Authority and Reclamation, 2021).

Waterways

Waterways within the study area consist of streams (ephemeral, intermittent, and perennial), canals, irrigation ditches, and a river. Waterways that could be affected by geotechnical and geophysical field investigations include Funks, Stone Corral, and Antelope Creeks, Funks Reservoir, and numerous unnamed irrigation ditches and ephemeral streams.

Waterways with adjacent riparian and emergent wetland vegetation provide food, water, and migration and dispersal corridors, as well as escape, nesting, and thermal cover for a variety of wildlife and fish

species. The open water areas of rivers and creeks provide resting and escape cover for many species of waterfowl and other waterbirds. Insectivorous birds, such as swallows, swifts, and flycatchers catch insects over open water areas. Shoreline and shallow water areas provide foraging opportunities for waterfowl, herons, and shorebirds. Riparian vegetation provides cover, nesting, and foraging opportunities for many wildlife species (Mayer and Laudenslayer 1988: 86, 130). Wildlife diversity and use is generally reduced in areas that do not contain riparian vegetation or that are covered with riprap. Wildlife that may use the river or its banks include Western pond turtle (*Emys marmorata*), Western fence lizard (*Sceloporus occidentalis*), which occurs primarily in riprap areas, diving and dabbling ducks, raccoon (*Procyon lotor*), and striped skunk (*Mephitis mephitis*).

Waterways in the study area fall within the Sacramento-San Joaquin Province (Central Valley Subprovince), one of six aquatic zoogeographic provinces in California, as defined by Moyle (2002). The Sacramento-San Joaquin Province is drained by the Sacramento and San Joaquin rivers. Generally, four native fish assemblages can be recognized in Central Valley streams: rainbow trout assemblage, California roach assemblage, pikeminnow-hardhead-sucker assemblage, and deep-bodied fish assemblage (Moyle, 2002). Based on their geographic location, the waterways within the study area are characterized by the deep-bodied fish assemblage and the pikeminnow-hardhead-sucker assemblage. Native fish species common to these two zones include Sacramento pikeminnow (*Ptychocheilus grandis*), Sacramento sucker (*Catostomus occidentalis*), Sacramento hitch (*Lavina exilicauda exilicauda*), Sacramento blackfish (*Orthodon microlepidotus*), hardhead (*Mylopharodon conocephalus*), tule perch (*Hysterocarpus traskii*), speckled dace (*Rhinichthys osculus*), California roach (*Lavinia symmetricus*), and riffle sculpin (*Cottus gulosus*). Introduced species also found in these zones include black bass (largemouth, smallmouth, spotted) (*Micropterus* spp.), sunfish (*Lepomis* spp.), striped bass (*Morone saxatilis*), and American shad (*Alosa sapidissima*). Anadromous species passing through or spawning in these zones include steelhead (*Oncorhynchus mykiss*), Chinook salmon (*Oncorhynchus tshawytscha*), lamprey (*Lampetra* and *Entosphenus* spp.), and sturgeon (*Acipenser* spp.).

A more detailed description of each of these waterway types is provided below.

Named Creeks

In the study area, several named creeks bisect the landscape and drain the hillsides of the western study area including Funks Creek, Stone Corral Creek, and Antelope Creek. All flow through irrigated pasture, rice fields, and row crop agriculture until they flow into the Colusa Basin Drain. These creeks are incised and revetted in some areas and have been straightened and altered by farming practices. Additional information on each of these creeks is provided below. Bird Creek, an ephemeral feature, occurs in Yolo County along the proposed Dunnigan Pipeline and is also described below.

Funks Creek

Funks Creek originates at approximately 850 feet elevation in blue oak savanna in the foothills west of Antelope Valley. It flows southeast as an intermittent natural stream, where it is joined by Grapevine Creek. As it flows through the foothills and Antelope Valley, its banks are generally eroded to near-vertical slopes, the gravel bed is highly disturbed and compacted by cattle, and it is bordered by annual grassland vegetation. Little to no riparian vegetation occurs throughout much of this reach, although occasional cottonwoods, willows, or nonnative species occur along the banks (Authority and Reclamation, 2021).

Along the north end of Antelope Valley, Funks Creek receives underground drainage from Salt Lake. Salt Lake is a 28-acre area of impounded water and seasonal alkaline wetlands formed by warm salt springs that occur upslope.

As Funks Creek cuts through the Golden Gate gap and enters the west side of the Sacramento Valley, the stream channel becomes wider, although flows are still intermittent. The banks and channel have occasional groupings of riparian trees and shrubs. Occasional wetlands occur, mainly small patches of emergent wetland or stock ponds. Approximately 1 mile downstream of the Golden Gate gap, Funks Creek is impounded by Funks Reservoir. This reservoir is fed mainly by waters of the TCC. Downstream of the reservoir, Funks Creek is bordered by agricultural lands, and much of this reach is channelized before emptying into Stone Corral Creek. The banks are bordered by levee roads and are sparsely vegetated with nonnative weedy species. Occasional native or nonnative riparian trees and shrubs occur along the bank, as well as small patches of emergent wetland vegetation. This portion of Funks Creek likely has some flow year round due to leakage from the dam at Funks Reservoir. A large wetland area, fed by waters from agricultural canals and Funks Creek, occurs upstream of the confluence of Funks Creek and Stone Corral Creek.

Upstream of Funks Reservoir, stream habitat in Funks Creek consists of 51 percent flatwater, 35 percent pools, and 14 percent riffles. Based on surveys during January and February 1999, the average habitat unit length is 212 feet for flatwater, 146 feet for pools, and 57 feet for riffles. Substrates range from silt/clay to small cobbles, with gravel the dominant substrate in the upper reaches of Funks Creek and silt/clay dominating substrates in lower reaches above Funks Reservoir. The streambanks consist overwhelmingly of silt and clay. Star-thistle and grasses are the dominant vegetation types along the streambanks. Woody riparian vegetation is sparse and consists of cottonwood, willow, oak, and walnut. Overall, canopy cover averages 5 percent over the stream's length, with most woody riparian vegetation concentrated in the vicinity of Golden Gate gap and the upper reaches of the creek. The portion of Funks Creek immediately upstream of Funks Reservoir supports a thin line of riparian and other associated trees, and very small patches of wetland vegetation within its bed. Instream cover in Funks Creek is composed of undercut banks, instream woody material, terrestrial and aquatic vegetation, boulders and bedrock ledges, and bubble curtain, and averages 27 percent of stream area. Aquatic vegetation and boulders are the dominant cover type. (Brown, 2000.)

Limited information is available on habitat conditions in Funks Creek downstream of Funks Reservoir. However, based on aerial imagery (Google Earth), woody riparian vegetation is intermittent, and the creek is largely unshaded. An approximately 0.7-acre area of riparian habitat occurs downstream of the existing dam. Further downstream, streambanks appear to be vegetated largely with herbaceous species. Because of the flat gradient, stream habitat diversity is low and appears to be dominated by flatwater habitats. It is likely that substrates are dominated by sand and silt/clay because of the generally flat gradient. All work would avoid the bed and banks of Funks Creek.

Stone Corral Creek

Stone Corral Creek is characterized as an intermittent stream with a narrow, slightly incised, channel characterized by riparian vegetion. The headwaters of Stone Corral Creek are located west of the study area in the Coast Range foothills. It flows southeast through the southern portion of the study area near the town of Sites. The new portions of the study area occur in the Stone Corral Creek (HUC 1802010406) and Logan Creek (HUC 1802010405) watersheds. The drainage area of the Stone Corral Creek watershed is 38.2 square miles. The only place where activities are proposed near Stone Corral

Creek is along Maxwell Sites Road in the southern portion of the study area. All work would avoid the bed and banks of Stone Corral Creek.

Antelope Creek

Antelope Creek is characterized as an intermittent stream with a narrow, slightly incised, channel characterized by riparian vegetion. The headwaters of Antelope Creek are also on the western side of the proposed inundation area in the Coast Range foothills, just south of the headwaters of Grapevine Creek. Antelope Creek flows south, then east, and then north through the southern portion of the study area joining Stone Corral Creek near the town of Sites. Antelope Creek crosses into the southern most portion of the study area along Huffmaster Road. One work area is in the vicinity, HM-B-029. All work would avoid the bed and banks of Antelope Creek.

Bird Creek

Bird Creek is characterized as an ephemeral stream with a narrow, slightly incised, channel that is mostly devoid of riparian vegetion. It originates in the Dunnigan Hills west of the study area. Bird Creek crosses into the study area west of I-5 within croplands and continues under I-5 and County Road 99W and ends within croplands just west of the Colusa Basin Drain. All work would avoid the bed and banks of Bird Creek.

Ephemeral and Intermittent Streams, Canals, and Ditches

Except for the irrigation ditches and canals, all of these waterways are natural channels that drain the west side of the Sacramento River Valley and flow to the Colusa Basin, and subsequently the Sacramento River via the Colusa Basin Drain. With the advent of agriculture in the region, most reaches of these waterways were channelized and some were dredged to carry agricultural runoff in addition to natural flows (Brown, 2000). Most irrigation ditches in the study area are earthen channels, while the larger irrigation canals
(e.g., TCC and Glenn-Colusa canals) are concrete lined.

Stream flow in these drainages' peaks during winter months in response to runoff during winter storms. Flow returns to high levels in the valley reaches of these streams during late summer when rice fields are drained. During summer, many of the reaches in these streams are dry, except for occasional pools or periods when receiving agricultural drainage or runoff. Water quality in these creeks is reported to be generally poor and high in dissolved minerals (Brown, 2000).

Special-Status Species

For the purpose of this report, special-status species are plant and animals that are legally protected under the federal 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 animal and plants are those species in any of the following categories.

- Species listed or proposed for listing as threatened or endangered under ESA (50 Code of Federal Regulations [CFR] 17.11 [listed animals], 50 CFR 17.12 [listed plants], and various notices in the Federal Register [FR] [proposed species]).
- Species that are candidates for possible future listing as threatened or endangered under ESA (81 FR 87246, December 8, 2021).
- Species listed or proposed for listing by the State of California as threatened or endangered under CESA (14 California Code of Regulations 670.5).
- Species that meet the definitions of rare or endangered under the California Environmental Quality Act (CEQA) (State CEQA Guidelines Section 15380).
- Plants listed as rare under the California Native Plant Protection Act (California Fish and Game Code Section 1900 et seq.).
- Plants with a California Rare Plant Rank of 1 or 2 (California Native Plant Society, 2020).
- Wildlife species of special concern to the CDFW, Special Animals List (CDFW, 2021).
- Fish species of special concern to CDFW (Moyle et al., 2015).
- Animals fully protected in California (California Fish and Game Code Sections 3511 [birds], 4700 [mammals], 5050 [amphibians and reptiles], and 5515 [fish]).

Tables 1 and 2 list special-status plant and animal species, respectively, that are known to occur or have the potential to occur in the geographic region (i.e., within 5-miles of the study area for animals and 10-miles for plants). These species were identified based on the CNDDB records search (CDFW, 2021), the California Native Plant Society Inventory of Rare and Endangered Plants (2020), the USFWS Information for Planning and Consultation species list (USFWS, 2021), the NMFS species list (National Marine Fisheries Service, 2021), and species distribution and habitat requirements data.

Table 1. Special-Status Plant Species Identified as Having the Potential to Occur in the Study Area

Common and Scientific Names	Status[a] Federal/State/ California Rare Plant Rank	Distribution	Habitat Requirements and Blooming Period	Potential for Occurrence[b, c]
Adobe lily *Fritillaria pluriflora*	–/–/1B.2	Inner North Coast Ranges, northern Sierra Nevada foothills, and adjacent margins of the Sacramento Valley, from Butte County to Solano County	Adobe clay soil, sometimes serpentine; foothill and valley grasslands, oak woodlands, chaparral; from 195–2,315 feet; blooms February–April	High—oak woodland, grassland, clay soils present; two occurrences within 5 miles of the study area
Adobe navarretia *Navarretia nigelliformis* ssp. *nigelliformis*	–/–/4.2	Great Valley and adjacent foothills	Vernal pools and clay flats; below 3,280 feet; blooms April–June	Moderate —seasonal wetlands present; occurrences of most CRPR 4 species not tracked in CNDDB
Ahart's dwarf rush *Juncus leiospermus* var. *ahartii*	–/–/1B.2	East edge of Sacramento Valley from Butte County to Sacramento County	Vernal pools; from 100–330 feet; blooms March–May	Low—seasonal wetlands present, but most of study area is outside of species' range; one occurrence within 1 mile of the study area
Ahart's paronychia *Paronychia ahartii*	–/–/1B.1	Northern Central Valley	Vernal swales and margins of vernal pools, on rocky soils; from 95–1,675 feet; blooms April–June	Moderate—seasonal wetlands present, but unlikely to include suitable soils; two occurrences within 3 miles of the study area
Awl-leaved navarretia *Navarretia subuligera*	–/–/4.3	Interior North Coast Ranges, northern Sierra Nevada foothills, Sacramento Valley	Rocky, mesic areas in chaparral, cismontane woodland, lower montane coniferous forest; 490–3,610 feet; blooms April–August	Moderate—chaparral, oak woodland, and foothill pine woodland present; occurrences of most CRPR 4 species not tracked in CNDDB
Baker's navarretia *Navarretia leucocephala* ssp. *bakeri*	–/–/1B.1	Inner Coast Ranges, southwestern Sacramento Valley from Mendocino County to Solano County	Vernal pools and swales on clay or alkaline soils; from 15–5,710 feet; blooms May–July	High—seasonal wetlands and clay or alkaline soils present; one occurrence within the conveyance to regulating reservoirs and one occurrence within the study area
Bent-flowered fiddleneck *Amsinckia lunaris*	–/–/1B.2	Inner North Coast Ranges, San Francisco Bay area, west-central Central Valley	Coastal bluff scrub, valley and foothill grasslands, cismontane woodlands; from 10–1,645 feet; blooms March–June	High—grassland present; two occurrences in the study area; two additional occurrences within 1 mile of the inundation area

Common and Scientific Names	Status[a] Federal/State/ California Rare Plant Rank	Distribution	Habitat Requirements and Blooming Period	Potential for Occurrence[b, c]
Big-scale balsamroot *Balsamorhiza macrolepis* var. *macrolepis*	–/–/1B.2	Scattered occurrences in the Coast Ranges and Sierra Nevada foothills	Fields and rocky hillsides, grassland, foothill woodland; 150–5,100 feet; blooms March–June	Low—grassland, oak woodland, and foothill pine woodland present; no occurrences within 5 miles of the study area
Boggs Lake hedge-hyssop *Gratiola heterosepala*	–/E/1B.2	Inner North Coast Ranges, Central Sierra Nevada Foothills, Sacramento Valley and Modoc Plateau: Fresno, Lake, Lassen, Madera, Merced, Modoc, Placer, Sacramento, Shasta, Siskiyou, San Joaquin, Solano, Sonoma, and Tehama Counties; also Oregon	Clay soils in areas of shallow water, lake margins of swamps and marshes, vernal pool margins; 30–7,790 feet; blooms April–August	Low—seasonal wetland and freshwater marsh present; no occurrences within 5 miles of the study area
Bolander's horkelia *Horkelia bolanderi*	–/–/1B.2	Inner North Coast Ranges in Lake and Colusa Counties	Edges of vernally moist areas in pine forest and oak woodland; from 1,490–2,800 feet; blooms June–August	High—oak woodland and seasonal wetlands present; one occurrence within 2.5 miles of the study area
Brandegee's eriastrum *Eriastrum brandegeeae*	–/–/1B.1	Inner North Coast Ranges, disjunct to Mount Hamilton	Chaparral, oak woodland; 1,395–2,755 feet; blooms May–August	Moderate—chaparral and oak woodland present; occurrences of most CRPR 4 species not tracked in CNDDB
Brazilian watermeal *Wolffia brasiliensis*	–/–/2B.3	Known in California from a few occurrences along the Sacramento River in Butte, Glenn, Sutter, and Yuba Counties; widespread elsewhere in the U.S.	Shallow freshwater in marshes and swamps; 65–330 feet; blooms April–December	Low—freshwater marsh present; no occurrences within 5 miles of the study area
Brewer's milk-vetch *Astragalus breweri*	–/–/4.2	Central and southern North Coast Ranges, northern San Francisco Bay Area	Grasslands, on open slopes, below 2,970 feet; blooms March–June	Moderate—grassland present; occurrences of most CRPR 4 species not tracked in CNDDB
Broad-lobed linanthus *Leptosiphon latisectus*	–/–/4.3	North Coast Ranges	Open grassy areas in broadleaved evergreen forest, on slopes and roadcuts, below 4,920 feet; blooms March–June.	Low—no broadleaved evergreen forest present; occurrences of most CRPR 4 species not tracked in CNDDB

Common and Scientific Names	Status[a] Federal/State/ California Rare Plant Rank	Distribution	Habitat Requirements and Blooming Period	Potential for Occurrence[b, c]
Brittlescale *Atriplex depressa*	–/–/1B.2	Western and eastern Central Valley and adjacent foothills on west side of Central Valley	Alkali grassland, alkali meadow, alkali vernal pools, and alkali scrub; below 1,050 feet; blooms April–August	High—alkali seasonal wetlands present; two occurrences within 0.5 and 2.6 miles of the study area
Butte County fritillary *Fritillaria eastwoodiae*	–/–/3.2	Sierra Nevada Foothills, from Shasta to El Dorado Counties; also Oregon	Chaparral, cismontane woodland, openings in lower montane coniferous forest, sometimes on serpentine; 165–4,920 feet; blooms March–June	Low—chaparral, oak woodland, and foothill pine forest present, no serpentine, study area is outside of species' range; no occurrences within 5 miles of the study area
Butte County meadowfoam *Limnanthes floccosa* ssp. *californica*	E/E/1B.2	Endemic to Butte County	Vernal pools and swales; 150–3,050 feet; blooms March–May	Low—seasonal wetlands present, but study area is outside of species' range; no occurrences within 5 miles of the study area
California alkali grass *Puccinellia simplex*	–/–/1B.2	Scattered locations in the San Francisco Bay area, Central Valley, Tehachapi Mountains, western Mojave Desert	Seasonally wet alkali wetlands, sinks, flats, vernal pools, and lake margins; below 3,000 feet; blooms March–May	High—alkali seasonal wetlands present; two occurrences within 5 miles of the study area
Caper-fruited tropidocarpum *Tropidocarpum capparideum*	–/–/1B.1	Historically known from the northwest San Joaquin Valley and adjacent Coast Range foothills	Grasslands in alkali hills; below 500 feet; blooms March–April	Moderate—grassland present, alkali hills unlikely; no occurrences within 5 miles of the study area
Cleveland's milk-vetch *Astragalus clevelandii*	–/–/4.3	Interior North Coast Ranges, High North Coast Ranges	Meadows, seeps, and streambanks, on serpentinite, at 328–4,920 feet; blooms June–September	Low—streams present, but no serpentinite; occurrences of most CRPR 4 species not tracked in CNDDB
Cobb Mountain lupine *Lupinus sericatus*	–/–/1B.2	Inner North Coast Ranges; Colusa, Lake, Napa, and Sonoma Counties	Knobcone pine-oak woodland, on open wooded slopes, in gravelly soils; 900–5,005 feet; blooms March–June	Low—no suitable knobcone pine habitat present; no occurrences within 5 miles of the study area
Colusa grass *Neostapfia colusana*	T/E/1B.1	Merced, Solano, and Yolo Counties	Deep vernal pools; from 15–655 feet; blooms May–September	Low—no deep vernal pools identified during land cover mapping; one occurrence within the study area

Common and Scientific Names	Status[a] Federal/State/ California Rare Plant Rank	Distribution	Habitat Requirements and Blooming Period	Potential for Occurrence[b, c]
Colusa layia *Layia septentrionalis*	–/–/1B.2	Inner North Coast Ranges	Sandy or serpentine soils, in grasslands and openings in chaparral and foothill woodlands; from 50–3,610 feet; blooms April–May	Moderate—grassland, oak woodland, and chaparral present, suitable soils may not be present; two occurrences within 4 to 5 miles of the study area
Cotula navarretia *Navarretia cotulifolia*	–/–/4.2	Interior North Coast Ranges, Sacramento Valley, San Francisco Bay Area, Interior South Coast Ranges	Chaparral, woodlands, grasslands, on heavy clay soils; 15–6,000 feet; blooms May–June	Moderate—grassland, chaparral, oak woodland present, some clay soils; occurrences of most CRPR 4 species not tracked in CNDDB
Coulter's goldfields *Lasthenia glabrata* ssp. *coulteri*	–/–/1B.1	Tehachapi Mountains, southern Outer South Coast Ranges, South Coast, northern Channel Islands, Peninsular Ranges, western Mojave Desert	Grassland, vernal pools; alkaline soils; below 4,590 feet; blooms February–June	Moderate—seasonal wetland and alkaline soils present; one occurrence within 2 miles of the study area
Crownscale *Atriplex coronata* var. *cotonata*	–/–/4.2	Southern Sacramento Valley, San Joaquin Valley, Inner South Coast Ranges	Alkali grassland, alkali meadow, alkali scrub; 5–1,940 feet; blooms March–October	Moderate—alkali grassland present; occurrences of most CRPR 4 species not tracked in CNDDB
Deep-scarred cryptantha *Cryptantha excavata*	–/–/1B.1	Southern Inner North Coast Ranges	Steep sandy or gravelly slopes, streambanks, in oak woodland; from 325–1,970 feet; April–May	Moderate—oak woodland present; one historical occurrence within 4 miles of the study area
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 Range	Grassland, chenopod scrub, on clay soils, where grass cover is sparse enough to allow growth of low annuals; below 3,200 feet; blooms March–May	Moderate—grassland present and suitable soils; one historical occurrence within 4 miles of the study area
Dimorphic snapdragon *Antirrhinum subcordatum*	–/–/4.3	Inner North Coast Ranges: Colusa, Glenn, Lake, and Tehama Counties	Chaparral and lower montane coniferous forest, sometimes on serpentinite; from 605–2,625 feet; blooms April–July	High—chaparral present; one occurrence at edge of the study area

Common and Scientific Names	Status[a] Federal/State/ California Rare Plant Rank	Distribution	Habitat Requirements and Blooming Period	Potential for Occurrence[b, c]
Drymaria-like western flax *Hesperolinon drymarioides*	–/–/1B.2	Interior and high North Coast Ranges	Chaparral, McNab cypress forest, on serpentinite, from 1,300–6,560 feet; blooms May–August	Low—chaparral present, but no serpentine soils; six occurrences within 5 miles of the study area
Dwarf downingia *Downingia pusilla*	–/–/2B.2	Central Valley from Tehama County to Fresno County, northern San Francisco Bay area, southern South Coast Ranges	Vernal pools; from 45–3,640 feet; blooms March–May	Moderate—seasonal wetlands present; two occurrences within 4 miles of the study area
Dwarf soaproot *Chlorogalum pomeridianum* var. *minus*	–/–/1B.2	Widely disjunct populations in Tehama, Colusa, Lake, Sonoma, and San Luis Obispo Counties	Openings in chaparral, valley and foothill grasslands; on serpentine outcrops; from 1,000–3,300 feet; blooms May–August	Low—chaparral and grassland present, but no serpentine soils; one occurrence within 4 miles of the study area
Fairy candelabra *Androsace elongata* ssp. *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; 490–4,280 feet; blooms March–June	Moderate—grassland and some areas of rock outcrop present; occurrences of most CRPR 4 species not tracked in CNDDB
Ferris' goldfields *Lasthenia ferrisiae*	–/–/4.2	Sacramento Valley, San Joaquin Valley	Vernal pools or wet saline flats; < 2,300 feet; blooms February–May	Moderate—seasonal wetland and potential alkali seasonal wetland present; occurrences of most CRPR 4 species not tracked in CNDDB
Ferris' milk-vetch *Astragalus tener* var. *ferrisiae*	–/–/1B.1	Sacramento Valley	Subalkali flats and flood lands, usually on adobe soil; from 5–245 feet; blooms March–June	Moderate—alkali seasonal wetlands present; one occurrence within 2 miles of the study area
Greene's tuctoria *Tuctoria greenei*	E/R/1B.1	Eastern Central Valley and foothills	Large, deep vernal pools; from 95–3,510 feet; blooms May–June	Low—no large, deep pools identified during land cover mapping; one occurrence within 3 miles of the study area
Hairy Orcutt grass *Orcuttia pilosa*	E/E/1B.1	Scattered locations along east edge of the Central Valley and adjacent foothills, from Tehama County to Merced County	Deep vernal pools; from 150–655 feet; blooms May–August	Low—no large, deep pools identified during land cover mapping; six occurrences within 1 to 4 miles of the study area

Common and Scientific Names	Status[a] Federal/State/ California Rare Plant Rank	Distribution	Habitat Requirements and Blooming Period	Potential for Occurrence[b, c]
Hall's harmonia *Harmonia hallii*	–/–/1B.2	Southern Interior North Coast Ranges	Open areas in serpentine chaparral, at 1,100–3,050 feet; blooms April–June	Low—chaparral present, but no serpentine; no occurrences within 5 miles of the study area
Heartscale *Atriplex cordulata* var. *cordulata*	–/–/1B.2	Central Valley from Colusa County to Kern County	Alkali grassland, alkali meadow, alkali scrub; below 1,835 feet; blooms May–October	Moderate—alkali seasonal wetlands present; five occurrences within 5 miles of the study area
Heckard's peppergrass *Lepidium latipes* var. *heckardii*	–/–/1B.2	Yolo and Solano Counties	Annual grassland, on margins of alkali scalds; from 5–655 feet; blooms April–May	Moderate—alkali seasonal wetlands present; one occurrence within 4 miles of the study area
Heller's bush mallow *Malacothamnus helleri*	–/–/4.3	Interior North Coast Ranges	Foothill woodlands, along stream banks and on gravel bars; 1,000–2,090 feet; blooms May–June	Moderate —perennial and intermittent stream and riparian woodland present; occurrences of most CRPR 4 species not tracked in CNDDB
Henderson's bent grass *Agrostis hendersonii*	–/–/3.2	Scattered locations in Central Valley and adjacent foothills	Moist places in grasslands, vernal pools; 230–1,000 feet; blooms April–May	Low —seasonal wetlands present; no occurrences within 5 miles of the study area
Hoary navarretia *Navarretia eriocephala*	–/–/4.3	Sacramento Valley, northern Sierra Nevada Foothills	Seasonally wet clay flats in grassland, oak woodland; below 1,310 feet; blooms May–June	Moderate —seasonal wetlands and oak woodland present; occurrences of most CRPR 4 species not tracked in CNDDB
Hogwallow evax *Hesperevax caulescens*	–/–/4.2	Interior North Coast Ranges, Cascade Range Foothills, Sierra Nevada Foothills, Great Valley, Outer South Coast Ranges	Vernal pools and flats, on clay soils; below 1,660 feet; blooms March–June	Moderate—seasonal wetlands and areas of clay soils present; occurrences of most CRPR 4 species not tracked in CNDDB
Hoover's lomatium *Lomatium hooveri*	–/–/4.3	Interior North Coast Ranges	Serpentine chaparral and woodlands, at 980–1,970 feet; blooms April–May	Low—chaparral and woodlands present, but no serpentine; occurrences of most CRPR 4 species not tracked in CNDDB
Hoover's spurge *Euphorbia hooveri*	T/–/1B.2	Central Valley from Tehama County to Tulare County	Large, deep vernal pools; from 80–820 feet; blooms July–August	Low—no large, deep pools identified during land cover mapping; four occurrences within 2 to 48 miles of the study area

Common and Scientific Names	Status[a] Federal/State/ California Rare Plant Rank	Distribution	Habitat Requirements and Blooming Period	Potential for Occurrence[b, c]
Howell's broomrape *Aphyllon valida* ssp. *howellii*	–/–/4.3	Southern High North Coast Ranges, central and southern Interior North Coast Ranges	Chaparral, on volcanic and serpentine substrates, parasitic on *Garrya*, at 660–5,580 feet; blooms June–September	Low—chaparral present, but no serpentine soils; occurrences of most CRPR 4 species not tracked in CNDDB
Indian Valley brodiaea *Brodiaea rosea* ssp. *rosea*	–/E/3.1	Colusa, Glenn, Lake, and Tehama Counties	Meadows and other vernally moist areas in serpentine chaparral; from 1,100–4,760 feet; blooms May–June	Low—chaparral present, but no serpentine soils; one occurrence within 4 miles of the study area
Jepson's milk-vetch *Astragalus rattanii* var. *jepsonianus*	–/–/1B.2	Scattered occurrences in the Inner North Coast Ranges, from Tehama County to Napa County	Grasslands and open grassy areas in chaparral, on serpentinite soils, from 970–2,300 feet; blooms April–June	Low—grasslands and chaparral present, but no serpentine soils; one occurrence within 4 miles of the study area
Jepson's navarretia *Navarretia jepsonii*	–/–/4.3	Inner North Coast Ranges	Serpentine grasslands, clay flats, at 490–2,620 feet; blooms April–June	Low—grasslands present, but no serpentine soils; occurrences of most CRPR 4 species not tracked in CNDDB
Keck's checkerbloom *Sidalcea keckii*	E/–/1B.1	Southern Inner North Coast Ranges, southern Sierra Nevada foothills	Grasslands, grassy areas within blue oak woodland, on clay soils, sometimes derived from serpentinite; below 2,200 feet; blooms April–May	High—grassland and oak woodland present; one occurrence adjacent to, and one additional occurrence within 4 miles of the study area
Konocti manzanita *Arctostaphylos manzanita* ssp. *elegans*	–/–/1B.3	Klamath Ranges, North Coast Ranges	Chaparral, oak woodland, lower montane coniferous forest, on volcanic soils; from 225–6,000 feet; blooms February–May	Moderate—chaparral and blue oak woodland present; one occurrence within 3 miles of the study area
Legenere *Legenere limosa*	–/–/1B.1	Southern North Coast Ranges, southern Sacramento Valley, northern San Joaquin Valley, San Francisco Bay area	Vernal pools; below 2,885 feet; blooms May–June	Moderate—seasonal wetlands present; three occurrences within 2 to 3 miles of the study area
Little mousetail *Myosurus minimus* ssp. *apus*	–/–/3.1	Central Valley and South Coast from Butte County south to San Diego County; Baja California, Oregon	Valley and foothill grassland, alkaline vernal pools; 65–2,100 feet; blooms March–June	Low—alkali seasonal wetlands present; no occurrences within 5 miles of the study area

Common and Scientific Names	Status[a] Federal/State/ California Rare Plant Rank	Distribution	Habitat Requirements and Blooming Period	Potential for Occurrence[b, c]
Milo Baker's lupine *Lupinus milo-bakeri*	–/T/1B	North Coast Ranges: Colusa and Mendocino County	Along streams, ditches, and roads, in foothill woodlands and grasslands; 1,300–1,410 feet; blooms June–September	Low—streams and roads in woodlands and grasslands present; no occurrences within 5 miles of the study area
Palmate-bracted bird's-beak *Chloropyron palmatum*	E/E/1B.1	Livermore Valley and scattered locations in the Central Valley from Colusa to Fresno County	Alkali grasslands, chenopod scrub; from 15–510 feet; blooms May–October	Moderate—alkali seasonal wetlands present; three occurrences within 1 to 4 miles of the study area
Pappose tarplant *Centromadia parryi* ssp. *parryi*	–/–/1B.2	Northern San Francisco Bay Area, North Coast Ranges, Sacramento Valley	Coastal prairie, meadows, seeps, coastal salt marsh, annual grassland, below 1,380 feet; blooms July–October.	Low—grassland and alkaline conditions present; no occurrences within 5 miles of the study area
Parry's red tarplant *Centromadia parryi* ssp. *rudis*	–/–/4.2	Inner North Coast Ranges, Sacramento Valley, northern San Joaquin Valley	Alkali meadow and grasslands; 0–330 feet; blooms June–October	Moderate — grasslands present; occurrences of most CRPR 4 species not tracked in CNDDB
Pink creamsacs *Castilleja rubicundula* ssp. *rubicundula*	–/–/1B.2	Foothills of northern Sacramento Valley	Grassland and grassy areas in chaparral and oak woodland, often on serpentinite, from 65–2,985 feet; blooms April–June	Moderate—chaparral, oak woodland, and grasslands present, but no serpentine soils present; two occurrences within 1 to 4 miles of the study area
Porter's navarretia *Navarretia paradoxinota*	–/–/1B.3	Interior North Coast Ranges	Swales and dry streambeds, in serpentine chaparral; 570–2,870 feet; blooms May–July	Low—ephemeral and intermittent streams and chaparral present, but no serpentine soils present; no occurrences within 5 miles of the study area
Purdy's fritillary *Fritillaria purdyi*	–/–/4.3	Northwestern California	Open areas in serpentine chaparral, woodlands, at 1,310–6,890 feet; blooms March–June	Low —chaparral and woodlands present, but no serpentine soils; occurrences of most CRPR 4 species not tracked in CNDDB

Common and Scientific Names	Status[a] Federal/State/ California Rare Plant Rank	Distribution	Habitat Requirements and Blooming Period	Potential for Occurrence[b, c]
Purdy's onion *Allium fimbriatum* var. *purdyi*	–/–/4.3	Central Interior North Coast Ranges	Serpentine outcrops, at 980–1,970 feet; blooms April–June	Low —some outcrops present, but no serpentine; occurrences of most CRPR 4 species not tracked in CNDDB
Rattan's milk-vetch *Astragalus rattanii* var. *rattanii*	–/–/4.3	Northern and central North Coast Ranges	Riverbanks, sandbars, at 160–4,920 feet; blooms April–July	Moderate—streams with sandbars present; occurrences of most CRPR 4 species not tracked in CNDDB
Recurved larkspur *Delphinium recurvatum*	–/–/1B.2	San Joaquin Valley and interior valleys of the South Coast Ranges, from Contra Costa County to Kern County	Subalkaline soils in annual grassland, saltbush scrub; 10–2,590 feet; blooms March–May	Low—alkaline grassland present; no occurrences within 5 miles of the study area
Red Bluff dwarf rush *Juncus leiospermus* var. *leiospermus*	–/–/1B.1	Inner North Coast Ranges, Cascade Range foothills, Modoc Plateau, Sacramento Valley, northern Sierra Nevada foothills	Vernally mesic sites in chaparral, valley and foothill grassland, cismontane woodlands; from 110–3,315 feet; blooms April–June	Moderate—seasonal wetlands present in parts of the study area, two occurrences within 1 to 2 miles of the study area
Red-flowered bird's-foot trefoil *Acmispon rubriflorus*	–/–/1B.1	Inner North Coast Ranges (Colusa, Tehama Counties), Inner South Coast Ranges (Stanislaus County)	Open, grassy areas in oak woodland; from 640–1,605 feet; blooms April–May	High—oak savanna and oak woodland present; one occurrence adjacent to and one occurrence less than 1 mile from the study area
Red Mountain catchfly *Silene campanula* ssp. *campanula*	C/E/1B	North Coast Ranges: Mendocino and Colusa County	On rocky slopes in Jeffrey pine forest and mixed chaparral; soils derived from ultramafic substrates; 1,400–6,840 feet; blooms April–July	Low—chaparral is present, but suitable soils are not likely present; no occurrences within 5 miles of the study area
Redding checkbloom *Sidalcea celata*	–/–/3	Shasta, Siskiyou, and Tehama Counties	Cismontane woodland, sometimes on serpentinite; 445–5,005 feet; blooms April–August	Low—oak woodland present, but study area is outside of species' range; no occurrences within 5 miles of the study area

Common and Scientific Names	Status[a] Federal/State/ California Rare Plant Rank	Distribution	Habitat Requirements and Blooming Period	Potential for Occurrence[b, c]
San Joaquin spearscale *Extriplex joaquinana*	–/–/1B.2	Eastern San Francisco Bay area, west edge of Central Valley from Glenn County to Fresno County	Alkali meadow, alkali grassland, saltbush scrub; from 3–2,740 feet; blooms April–September	Moderate—alkali seasonal wetland present; one occurrence in the study area and three occurrences within 2 to 3 miles of the study area
Sanford's arrowhead *Sagittaria sanfordii*	–/–/1B.2	Scattered locations in Central Valley and Coast Ranges	Freshwater marsh, sloughs, canals, and other slow-moving water habitats; 0–2,135 feet; blooms May–October (November)	Low—freshwater marsh, canals, and ditches present; no occurrences within 5 miles of the study area
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	Low—chaparral present, but no serpentine soils; occurrences of most CRPR 4 species not tracked in CNDDB
Serpentine cryptantha *Cryptantha dissita*	–/–/1B.2	Colusa, Lake, Mendocino, Napa, Shasta, Siskiyou, and Sonoma Counties	Chaparral, on serpentinite; 1,295–1,905 feet; blooms April–June	Low—chaparral present, but no serpentine soils; no occurrences within 5 miles of the study area
Serpentine milkweed *Asclepias solanoana*	–/–/4.2	Klamath Ranges, North Coast Ranges	Serpentine outcrops, at 2,300–5,250 feet; blooms June	Low—outcrops present, but no serpentine; occurrences of most CRPR 4 species not tracked in CNDDB
Serpentine sunflower *Helianthus exilus*	–/–/4.2	Klamath Ranges, North Coast Ranges	On streambanks, in gravelly serpentine soils, at 980–4,270 feet; blooms June–October	Low—streams present, but no serpentine soils; occurrences of most CRPR 4 species not tracked in CNDDB
Shield-bracted monkeyflower *Erythranthe glaucescens*	–/–/4.3	Southern Cascade Range foothills, northern Sierra Nevada foothills	Serpentine seeps in valley and foothill grassland, chaparral, cismontane woodland, lower montane coniferous forest; 200–4,070 feet; blooms February–August	Low—grassland, chaparral, oak woodland, and foothill pine forest present, potentially with seeps, but no serpentine soils; occurrences of most CRPR 4 species not tracked in CNDDB

Common and Scientific Names	Status[a] Federal/State/ California Rare Plant Rank	Distribution	Habitat Requirements and Blooming Period	Potential for Occurrence[b, c]
Shining navarretia *Navarretia nigelliformis* ssp. *radians*	–/–/1B.2	Foothills of the Inner 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; from 650–3,300 feet; blooms May–June	High—grassland and oak woodland with clay soils present; one occurrence in the study area
Sickle-fruited jewelflower *Streptanthus drepanoides*	–/–/4.3	Southernmost Klamath Ranges, high North Coast Ranges, northern interior North Coast Ranges, northern Sierra Nevada Foothills	Chaparral, cismontane woodland, lower montane coniferous forest, on serpentine; 900–5,450 feet; blooms April–June	Low—chaparral, oak woodland, and foothill pine forest present, but no serpentine soils; occurrences of most CRPR 4 species not tracked in CNDDB
Silky cryptantha *Cryptantha crinita*	–/–/1B.2	Cascade Range: Shasta, Tehama and Glenn Counties	Gravel bars and streambanks, within foothill woodlands; from 295–3,675 feet; blooms March–June	Low—gravelly streams present, but most of study area is outside of the species' range; one occurrence within 3 miles of the study area
Slender Orcutt grass *Orcuttia tenuis*	T/E/1B.1	Sierra Nevada and Cascade Range foothills, from Siskiyou County to Sacramento County	Vernal pools, from 100–5,690 m; blooms May–July	Low—seasonal wetlands present; no occurrences within 5 miles of the study area
Small spikerush *Elocharis parvula*	–/–/4.3	North Coast, San Francisco Bay Area, South Coast	Coastal brackish wetlands, below 160 feet; blooms late winter–fall	Low—seasonal wetlands present, some alkaline, but suitable brackish wetland habitat is unlikely; occurrences of most CRPR 4 species not tracked in CNDDB
Snow Mountain buckwheat *Eriogonum nervulosum*	–/–/1B.2	North Coast Ranges, from Colusa to Napa County	Chaparral, serpentine outcrops and barrens; from 1,460–6,900 feet; blooms June–September	Low—chaparral and some rock outcrops present, but no serpentine habitat present; one occurrence within 5 miles of the study area
Stony Creek spurge *Euphorbia ocellata* ssp. *rattanii*	–/–/1B.2	Inner North Coast Ranges in Glenn and Tehama Counties	Sandy or rocky soils, along streambeds or on shale slopes, in chaparral, riparian scrub, or grasslands; from 260–1,900 feet; blooms May–September	Low—grassland, chaparral, and riparian habitat present; no occurrences within 5 miles of the study area

Common and Scientific Names	Status[a] Federal/State/ California Rare Plant Rank	Distribution	Habitat Requirements and Blooming Period	Potential for Occurrence[b, c]
Sylvan microseris *Microseris sylvatica*	–/–/4.2	Scattered locations in California, primarily in the Interior North Coast Ranges, eastern San Francisco Bay, Interior South Coast Ranges, Sierra Nevada Foothills, and Tehachapi mountains	Grassland, oak woodland, open grassy areas in chaparral; below 5,580 feet; blooms April–May	Moderate—chaparral, oak savanna, and oak woodland present; occurrences of most List 4 species not tracked in CNDDB
Tehama navarretia *Navarretia heterandra*	–/–/4.3	Interior North Coast Ranges, Cascade Range foothills, western Sacramento Valley, east San Francisco Bay Area, interior South Coast Ranges, Modoc Plateau	Mesic areas in valley and foothill grasslands, vernal pools; 100–3,320 feet; blooms April–June	Moderate—grasslands and seasonal wetlands present; occurrences of most CRPR 4 species not tracked in CNDDB
Three-fingered morning-glory *Calystegia collina* ssp. *tridactylosa*	–/–/1B.2	Colusa, Lake, and Mendocino Counties	Chaparral and cismontane woodland on serpentinite, rocky, gravelly openings; 0–1,970 feet; blooms April–June	Low—chaparral and oak woodland present, but no serpentinite; no occurrences within 5 miles of the study area
Tracy's clarkia *Clarkia gracilis* ssp. *tracyi*	–/–/4.2	Interior North Coast Ranges	Serpentine chaparral, McNab cypress forest, open areas of meadow or streambanks, at 330–1,640 feet; blooms May–July	Low—grassland and streams present, but no serpentine; occurrences of most CRPR 4 species not tracked in CNDDB
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; from 1,030–7,880 feet; blooms June–July	Moderate—grassland, chaparral, and oak woodland, clay soils present; no occurrences within 5 miles of the study area
Tripod eriogonum *Eriogonum tripodum*	–/–/4.2	Interior North Coast Ranges, northern and central Sierra Nevada foothills	Gravelly slopes and flats, often on serpentine, in chaparral, cismontane woodland; 655–5,250 feet	Low—chaparral and oak woodland present, but no serpentine; occurrences of most CRPR 4 species not tracked in CNDDB
Vernal pool smallscale *Atriplex persistens*	–/–/1B.2	Central Valley, from Glenn County to Tulare County	Dry beds of vernal pools, on alkaline soils; from 30–375 feet; blooms June–October	Moderate—alkali seasonal wetlands present; 12 occurrences within 1 to 4 miles of the study area
Water star-grass *Heteranthera dubia*	–/–/2B.2	Scattered locations in northern California	Slow-moving water; below 4,920 feet; blooms July–August	Moderate—streams and ponds present; one occurrence within 5 miles of the study area

Common and Scientific Names	Status[a] Federal/State/ California Rare Plant Rank	Distribution	Habitat Requirements and Blooming Period	Potential for Occurrence[b, c]
Watershield *Brasenia schreberi*	–/–/2B.3	Scattered occurrences in north and central California	Ponds, lake margins, freshwater marshes; 0–7,220 feet; blooms June–September	Low—freshwater marsh and ponds present; no occurrences within 5 miles of the study area
Woolly meadowfoam *Limnanthes floccosa* ssp. *floccosa*	–/–/4.2	Klamath Ranges, Interior North Coast Ranges, Cascade Ranges	Vernal pools and swales; 200–4,380 feet; blooms March–May (June)	Low—vernal pools likely present; no occurrences within 5 miles of the study area
Woolly rose-mallow *Hibiscus lasiocarpos* var. *occidentalis*	–/–/1B.2	Cascade Range Foothills, Sacramento Valley, Sacramento–San Joaquin Delta, from Butte County to San Joaquin County	Freshwater marsh along rivers and sloughs; below 395 feet; blooms August–September	Low—freshwater marsh habitat present; no occurrences within 5 miles of the study area
Wright's trichocoronis *Trichocoronis wrightii* var. *wrightii*	–/–/2B.1	Scattered locations in the Central Valley and Southern Coast; Texas	On alkaline soils in floodplains, meadows and seeps, marshes and swamps, riparian forest, vernal pools; 15–1,425 feet; blooms May–September	Low—alkali seasonal wetlands and riparian forest present; no occurrences within 5 miles of the study area

Table sources: Unless otherwise referenced above, information was found online from the California Department of Fish and Wildlife 2021 and California Native Plant Society 2020

[a] Status Explanations:

Federal:

– = not listed under the federal Endangered Species Act

C = candidate for listing under the federal Endangered Species Act

E = listed as endangered under the federal Endangered Species Act

T = listed as threatened under the federal Endangered Species Act

State:

– = not listed under the California Endangered Species Act

R = listed as rare under the Native Plant Protection Act

E = listed as endangered under the California Endangered Species Act

T = listed as threatened under the California Endangered Species Act

California Rare Plant Rank:

1A = presumed extinct in California

1B = rare, threatened, or endangered in California and elsewhere

2B = rare, threatened, or endangered in California, but more common elsewhere

3 = more information is needed to determine whether assigning a rank is appropriate

4 = plants of limited distribution that are on a watch list

0.1 = seriously endangered in California

0.2 = fairly endangered in California

0.3 = not very endangered in California

[b] Includes all California Natural Diversity Database occurrences within 5 miles of the study area.

[c] Potential for Occurrence in Study Area

High: Known occurrence in the project region or in project area from CNDDB or other documents; suitable habitat and microhabitat conditions are present.

Moderate: Known occurrence in the project region from CNDDB or other documents; suitable habitat is present but suitable microhabitat conditions (generally soil type and/or hydrology) are not present.

Low: Known occurrence or not in the project region from CNDDB or other documents; suitable habitat and microhabitat conditions are unlikely to be present.

Table 2. Special-Status Wildlife Species Identified as Having the Potential to Occur in the Study Area

Common Name	Scientific Name	Status[a] Federal/State	Range and General Habitat Description	Potential for Occurrence
Conservancy fairy shrimp	*Branchinecta conservatio*	E/–	Disjunct occurrences in Tehama, Butte, Glenn, Yolo, Solano, Stanislaus, Merced, and Ventura Counties. Large, deep vernal pools with moderately turbid water in annual grasslands; generally, the pools last until June.	Low to moderate. Large vernal pools may be present in the study area. Known occurrence at Sacramento National Wildlife Refuge, approximately 1.5 miles from the study area (California Department of Fish and Wildlife 2021).
Vernal pool fairy shrimp	*Branchinecta lynchi*	T/–	Found in Central Valley and central and south Coast Ranges from Tehama County to Santa Barbara County; isolated populations also in Riverside County. Common in vernal pools; also found in sandstone rock outcrop pools.	Moderate. Vernal pools and other seasonal wetlands present in the study area. Several known occurrences at Sacramento National Wildlife Refuge, approximately 2.75–3.75 miles from the study area (California Department of Fish and Wildlife 2021).
Vernal pool tadpole shrimp	*Lepidurus packardi*	E/–	Shasta County, south to northwestern Tulare County, and the San Francisco Bay area. Vernal pools and other seasonal pools, ponded clay flats, roadside ditches, and stock ponds.	Moderate. Vernal pools and other seasonal wetlands present in the study area. Several known occurrences at Sacramento National Wildlife Refuge, approximately 1.25–3 miles from the study area (California Department of Fish and Wildlife 2021).
Antioch Dunes anthicid beetle	*Anthicus antiochensis*	–/–	Population in Antioch Dunes believed extinct. Present in several localities along the Sacramento River in Glenn, Tehama, Shasta, and Solano Counties, and the Feather River at Nicolas in Sutter County. Loose sand on sand bars and sand dunes (interior), unvegetated sand.	Moderate. Associated with the Sacramento River. Non-specific occurrence from 1989, presumably along the section of the Sacramento River that overlaps the operations study area (California Department of Fish and Wildlife 2021).

Common Name	Scientific Name	Status[a] Federal/State	Range and General Habitat Description	Potential for Occurrence
Sacramento anthicid beetle	*Anthicus sacramento*	–/–	Dune areas at mouth of Sacramento River; western tip of Grand Island, Sacramento County; upper Putah Creek and dunes near Rio Vista, Solano County; Ord Ferry Bridge, Butte County; San Joaquin River from Shasta to San Joaquin Counties; Feather River at Nicolaus. Found in sand slip-faces among willows; associated with riparian and other aquatic habitats, vegetated sand.	Low. Associated with the Sacramento River. Several records for occurrences along the Sacramento River in the operations study area (California Department of Fish and Wildlife 2021). No work near Sacramento River.
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	T/–	Central Valley from Tehama County south to Fresno County; most beetles have been documented below 500 feet in elevation. Elderberry shrubs (*Sambucus* spp.) are the host plant and are found in riparian and non-riparian (valley oak and blue oak woodland and annual grassland) habitats.	High. Suitable habitat (elderberry shrubs) present in the study area. Numerous records for occurrences along the Sacramento River within the operations study area (California Department of Fish and Wildlife 2021).
Wilbur Springs minute moss beetle	*Ochthebius recticulus*	–/–	Sulfur Creek, Colusa County Matted vegetation and decaying moss along stream shores and swampy areas.	Low. Study area is outside of species' known range. One geographically non-specific known occurrence (from before 1980) approximately 4.5 miles southeast of the southern extent of the study area (California Department of Fish and Wildlife 2021).
Monarch butterfly	*Danaus plexippus*	C/–	Adults breed and migrate throughout California and overwinter along the California coast and in central Mexico. Open habitats including fields, meadows, weedy areas, marshes, and roadsides. Monarch butterflies roost in wind-protected tree groves (such as eucalyptus) with nectar and water sources nearby. Caterpillar host plants are native milkweeds.	Moderate. Adults may breed and migrate through study area. Caterpillar host plants may be present in annual grassland. No known occurrences reported in the CNDDB (California Department of Fish and Wildlife 2021).

Common Name	Scientific Name	Status[a] Federal/State	Range and General Habitat Description	Potential for Occurrence
Blennosperma vernal pool andrenid bee	*Andrena blennospermatis*	–/–	Tehama, Placer, El Dorado, Sacramento, Yolo, Lake, Sonoma, Solano, San Joaquin, and Contra Costa Counties Upland areas near vernal pools.	Low. Suitable habitat may be present surrounding vernal pools. Most of species' known range is outside of study area. No known occurrences in Colusa or Glenn Counties; only two known occurrences in Tehama County, one of which is approximately 3.75 miles northeast of the RBPP (California Department of Fish and Wildlife 2021).
Crotch bumble bee	*Bombus crotchii*	–/CE	Pacific Coast, Western Desert, Great Valley, and adjacent foothills throughout most of southwestern California. Open grassland and scrub; nests underground. Food plants include members of the genera *Asclepias*, *Chaenactis*, *Lupinus*, *Medicago*, *Phacelia*, and *Salvia.*	Low to moderate. Suitable habitat in the study area; presence of food plants unknown. One geographically non-specific historical (1956) occurrence within 2 miles of the RBPP (California Department of Fish and Wildlife 2021).
Western bumble bee	*Bombus occidentalis*	–/CE	Historically occurred throughout much of northern California but currently appears to be absent from much of this area. Current known locations are high elevation sites in northern California and a few sites on the northern California coast. Nests underground in squirrel burrows, in mouse nests, and in open west-southwest facing slopes bordered by trees. Visits a wide variety of wildflowers; plant taxa it is most commonly associated with are *Asteraceae*, *Ceanothus*, *Centaurea*, *Chrysothamnus*, *Cirsium*, *Eriogonum*, *Geranium*, *Grindelia*, *Lupinus*, *Melilotus*, *Monardella*, *Rubus*, *Penstemon*, *Solidago*, and *Trifolium.*	Low to moderate. Suitable habitat in the study area; presence of food plants unknown. No known occurrences within 5 miles of the study area (California Department of Fish and Wildlife 2021).

Common Name	Scientific Name	Status[a] Federal/State	Range and General Habitat Description	Potential for Occurrence
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. Small ponds, lakes, or vernal pools in grasslands and oak woodlands for reproduction and larval development; rodent burrows, rock crevices, or fallen logs for cover for adults and juveniles for summer dormancy.	Low to none. Most of the study area is outside of the species' known range. There are no known occurrences in Glenn or Colusa Counties. While there are known extant locations west of Dunnigan within 3–4 miles of the Dunnigan Pipeline (California Department of Fish and Wildlife 2021), no suitable aquatic or upland habitat is present in the Dunnigan Pipeline portion of the study area.
Western spadefoot toad	*Spea hammondii*	–/SSC	Sierra Nevada foothills, Central Valley, Coast Ranges, coastal counties in southern California to western Baja California. Shallow streams with riffles and seasonal wetlands, such as vernal and seasonal pools in annual grasslands and oak woodlands; spends most of its life in burrows.	Low to moderate. Potentially suitable habitat is present in the inundation area. Five known occurrences that are 3–5 miles from the Dunnigan Pipeline (California Department of Fish and Wildlife 2021) but no suitable aquatic or upland habitat is present in the Dunnigan Pipeline portion of the study area.
California red-legged frog	*Rana draytonii*	T/SSC	Found along the coast and Coast Ranges of California from Mendocino County to San Diego County and in the Sierra Nevada from Tehama County to Fresno County; elevations from near sea level to about 4,900 feet. Permanent and semi-permanent aquatic habitats, such as slow-moving streams or creeks and cold-water ponds, with emergent and submergent vegetation (shrubby riparian). May aestivate in rodent burrows or cracks during dry periods.	Low to moderate. Suitable aquatic and upland habitats are present generally west of Funks Reservoir. There are no records for occurrences within 5 miles of the study area (California Department of Fish and Wildlife 2021).

Common Name	Scientific Name	Status[a] Federal/State	Range and General Habitat Description	Potential for Occurrence
Foothill yellow-legged frog (northwest/North Coast clade)	*Rana boylii*	–/SSC	Occurs in the Klamath, Cascade, North Coast, South Coast, Transverse, and Sierra Nevada Ranges up to approximately 6,000 feet. Creeks or rivers in woodland, forest, mixed chaparral, and wet meadow habitats with rock and gravel substrate and low overhanging vegetation along the edge. Usually found by riffles with rocks and on sunny banks nearby.	Low. The western portion of the study area is just outside the species' known range. All known occurrences in Glenn and Colusa Counties are at or above 750 feet elevation and the study area is at or below 500 feet elevation. Historical locations along the Sacramento River are extirpated. The nearest known occurrence is 6 miles from the study area (California Department of Fish and Wildlife 2021).
Western pond turtle	*Actinemys marmorata*	–/SSC	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. Occurs in woodlands, grasslands, and open forests. Occupies ponds, marshes, rivers, streams, and irrigation canals with muddy or rocky bottoms. Aquatic habitat contains watercress, cattails, water lilies, or other aquatic vegetation. Overwintering habitat consists of mud in stream and pond bottoms or a variety of upland habitats including riparian habitat for basking.	High. Suitable aquatic and upland habitats are present in the study area. Two known occurrences approximately 4 miles northeast of RBPP and 3 miles east at the Sacramento National Wildlife Refuge; several records for occurrences along the Sacramento River in the operations study area (California Department of Fish and Wildlife 2021).

Common Name	Scientific Name	Status[a] Federal/State	Range and General Habitat Description	Potential for Occurrence
Giant gartersnake	*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 and from Stanislaus County. Found at elevations from near sea level to 400 feet. Sloughs, canals, low gradient streams, and freshwater marsh habitats where there is a prey base of small fish and amphibians; also found in irrigation ditches and rice fields. Requires grassy banks and emergent vegetation for basking and areas of high ground protected from flooding during winter.	High. Suitable aquatic and upland habitats are present in the study area. Four records for occurrences within the study area. Numerous records for occurrences at Sacramento National Wildlife Refuge and other areas east of the inundation area, as well as around the east end of the Dunnigan Pipeline (California Department of Fish and Wildlife 2021).
Northern harrier	*Circus hudsonius*	–/SSC	Occurs throughout lowland California. Recorded in fall at high elevations ranging from near sea level to at least 9,000 feet in Mono County; largely within coastal lowlands from Lake Earl in Del Norte County to Bodega Head in Sonoma County, but also inland at Lake Berryessa in Napa County. Grasslands, meadows, marshes, and seasonal and agricultural wetlands/fields; prefers open habitats with adequate vegetative cover.	High. Suitable nesting and foraging habitats are present in the study area. There are no CNDDB occurrences reported within 5 miles of the study area, but there are numerous eBird observations of northern harrier in the study area (Cornell Lab of Ornithology 2021) and northern harrier was observed by an ICF biologist near Funks Reservoir during January 2021 focused bird surveys for geotechnical boring investigation locations.

Common Name	Scientific Name	Status[a] Federal/State	Range and General Habitat Description	Potential for Occurrence
Golden eagle	*Aquila chrysaetos*	–/FP	Occurs in foothills and mountains throughout California; uncommon nonbreeding visitor to lowlands such as 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 habitats are present in the study area. There are no CNDDB occurrences reported within 5 miles of the study area but there are numerous eBird observations of individuals in the study area (Cornell Lab of Ornithology 2021).
Bald eagle	*Haliaeetus leucocephalus*	–/E	Nests in Siskiyou, Modoc, Trinity, Shasta, Lassen, Plumas, Butte, Tehama, Lake, and Mendocino Counties and in the Lake Tahoe Basin. Reintroduced into central coast. Winter range includes the rest of California, except the southeastern deserts, very high altitudes in the Sierra Nevada, east of the Sierra Nevada south of Mono County, and some rangelands and coastal wetlands.	High. Suitable nesting and foraging habitats are present in the study area. One known occurrence at Sacramento National Wildlife Refuge, approximately 1.5 miles from the study area (California Department of Fish and Wildlife 2021). Several bald eagles observed by an ICF biologist at Funks Reservoir during January 2021 focused bird surveys for geotechnical boring investigation locations.
Swainson's hawk	*Buteo swainsoni*	–/E	Lower Sacramento and San Joaquin Valleys, the Klamath Basin, and Butte Valley. Highest nesting densities occur near Davis and Woodland, Yolo County. Requires large, open grasslands with suitable nest trees; nests in oaks or cottonwoods in or near riparian habitats; forages in grasslands, lightly grazed pastures, irrigated pastures, and grain fields.	High. Suitable nesting and foraging habitats are present in the study area. Numerous records for nest sites along the Sacramento River in the operations study area and other locations within the study area (California Department of Fish and Wildlife 2021).

Common Name	Scientific Name	Status[a] Federal/State	Range and General Habitat Description	Potential for Occurrence
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. Low foothills or valley areas with valley or live oaks, riparian areas, and marshes near open grasslands or cropland for foraging.	High. Suitable nesting and foraging habitats are present in the study area. One record for a nest site approximately 2.5 miles south of the RBPP and one record for a nest site approximately 3 miles east of the southern end of the inundation area (California Department of Fish and Wildlife 2021).
Mountain plover	*Charadrius montanus*	–/SSC	Does not breed in California; in winter, found in the Central Valley from Colusa County south, along the coast in parts of San Luis Obispo, Santa Barbara, Ventura, and San Diego Counties; parts of Imperial, Riverside, Kern, and Los Angeles Counties. Occupies open plains or rolling hills with short grasses or very sparse vegetation; nearby bodies of water are not needed; may use newly plowed or sprouting grain fields.	Moderate. Suitable winter foraging habitat in the study area. Three records for occurrences of flocks observed during the winter within 5 miles of the Dunnigan Pipeline portion of the study area (California Department of Fish and Wildlife 2021).
Western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	T/E	Nests along the upper Sacramento, lower Feather, south fork of the Kern, Amargosa, Santa Ana, and Colorado Rivers. Requires wide, dense riparian forests or woodlands with a thick understory of willows for nesting; sites with a dominant cottonwood overstory are preferred for foraging; may avoid valley oak riparian habitats where scrub jays are abundant; utilizes orchards adjacent to streams.	Low. Portions of the Sacramento River in the operations study area provide suitable habitat. Numerous records for occurrences along the Sacramento River within the operations study area (California Department of Fish and Wildlife 2021).

Common Name	Scientific Name	Status[a] Federal/State	Range and General Habitat Description	Potential for Occurrence
Western burrowing owl	*Athene cunicularia*	–/SSC	Lowlands throughout south, central, and east California, including the Central Valley, northeastern plateau, southeastern deserts, and some coastal areas; rare along the south coast. Level, open, dry, heavily grazed or low-stature grassland, or desert vegetation with available burrows; also found in coastal terrace prairies and sagebrush habitats.	High. Suitable nesting and foraging habitats are present in the study area. Twelve records for occurrences within 5 miles of the study area and one reported occurrence in the study area (California Department of Fish and Wildlife 2021).
Northern spotted owl	*Strix occidentalis caurina*	T/T	A permanent resident throughout its range; found in the North Coast, Klamath, and western Cascade Range from Del Norte County to Marin County. Dense old-growth or mature forests dominated by conifers with topped trees or oaks available for nesting crevices.	Low to none. Study area is outside of species' known range. No dense old growth or mature conifer forest in study area.

Common Name	Scientific Name	Status[a] Federal/State	Range and General Habitat Description	Potential for Occurrence
Bank swallow	*Riparia riparia*	–/T	Occurs along the Sacramento River from Tehama County to Sacramento County; along the Feather and lower American Rivers; in the Owens Valley in Inyo and Mono Counties; and in the plains east of the Cascade Range in Modoc, Lassen, and northern Siskiyou Counties. Small populations near the coast from San Francisco County to Monterey County. Altitudinal range extends from sea level to approximately 7,000 feet. Breeds primarily in lowland areas along ocean coasts, rivers, streams, lakes, reservoirs, and wetlands. Nests in vertical banks, cliffs, and bluffs in alluvial, friable soils. Also nests in artificial sites such as sand and gravel quarries and road cuts. Foraging habitats surrounding nesting colony include wetlands, open water, grasslands, riparian woodlands, agricultural areas, shrublands, and occasionally upland woodlands.	High. Portions of the Sacramento River in the operations study area provide suitable habitat. Numerous records for occurrences along the Sacramento River in the operations study area (California Department of Fish and Wildlife 2021).
Least Bell's vireo	*Vireo bellii pusillus*	E/E	Small populations remain in southern Inyo, southern San Bernardino, Riverside, San Diego, Orange, Los Angeles, Ventura, and Santa Barbara Counties. Found at the San Joaquin River National Wildlife Refuge (San Joaquin and Stanislaus Counties) in 2005. Riparian thickets/dense willows with a well-developed understory either near water or in dry portions of river bottoms; nests along margins of bushes and forages low to the ground; may also be found using mesquite and arrow weed in desert canyons.	Low. Portions of the Sacramento River in the operations study area provide suitable habitat, but the study area is outside of the species' known range and the historical occurrence along the Sacramento River is considered extirpated (California Department of Fish and Wildlife 2021).

Common Name	Scientific Name	Status[a] Federal/State	Range and General Habitat Description	Potential for Occurrence
Yellow-breasted chat	*Icteria virens*	–/SSC	Summer resident and migrant in coastal California and Sierra Nevada foothills, east of the Cascade Range in northern California, along the Colorado River, and very locally inland in southern California; numerous in northwestern region of the state. Nests in dense riparian habitats with a well-developed shrub layer and an open canopy, dominated by willows, alders, Oregon ash, tall weeds, blackberry vines, and grapevines.	Moderate. Suitable nesting habitat in the study area. One known occurrence from 1977 that is approximately 4.75 miles southeast of RBPP (California Department of Fish and Wildlife 2021). Several observations recorded in eBird at Sacramento National Wildlife Refuge and in the vicinity of Lodoga Stonyford Road (Cornell Lab of Ornithology 2021).
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. Most extensively concentrated in and around the Delta and coastal areas, including Monterey and Marin 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; requires water at or near the nesting colony; colonies found in silage and grain fields near dairies in the San Joaquin Valley; winters in grasslands and agricultural fields with low-growing vegetation.	High. Suitable nesting and foraging habitat present in the study area. More than 20 known occurrences within 5 miles of the study area, and two reported occurrences in the study area east of the GCID system improvements area and east of the inundation area (California Department of Fish and Wildlife 2021).

Common Name	Scientific Name	Status[a] Federal/State	Range and General Habitat Description	Potential for Occurrence
Yellow warbler	*Setophaga petechia brewsteri*	–/SSC	Breeds throughout California except the Central Valley, the Mojave Desert region, and high altitudes in the Sierra Nevada; winters along the Colorado River and in parts of Imperial and Riverside Counties. Nests in riparian areas with willows, cottonwoods, Oregon ash, or alders; also nests in montane shrubs in open ponderosa pine and mixed conifer forest, and in montane chaparral.	Moderate. Suitable nesting habitat in the study area. One known occurrence from 1977 that is approximately 3.7 miles southeast of RBPP (California Department of Fish and Wildlife 2021); several observations recorded in eBird within the last few years (Cornell Lab of Ornithology 2021).
Song sparrow (Modesto population)	*Melospiza melodia mailliardi*	–/SSC	Resides in the north-central portion of the Central Valley, with the highest densities in the Butte Sink area of the Sacramento Valley and in the Sacramento–San Joaquin River Delta Associated with freshwater marshes dominated by tules and cattails and riparian willow thickets. Also nests in riparian forests with blackberry understory and along vegetated irrigation canals and levees.	Moderate. Suitable nesting habitat in the study area. Records for occurrences along the Sacramento River in the operations study area (California Department of Fish and Wildlife 2021).
Western mastiff bat	*Eumops perotis californicus*	–/SSC	Occurs along the western Sierra Nevada primarily at low- to mid-elevations and widely distributed throughout the southern coast ranges; has been detected north to the Oregon border. Broadly distributed in southern California, from the Colorado River to the coast; found along many of the Sierra Nevada river drainages, particularly in the central and southern Sierra Nevada. Uses a wide variety of habitats from desert scrub to montane conifer; roosts and breeds in deep, narrow rock crevices; may also use crevices in trees, buildings, and tunnels Forages in a variety of habitats.	Low. Could migrate through or occasionally occur in the study area but is not anticipated to reside in the study area. One known occurrence from 1994 is approximately 4 miles east of the RBPP (California Department of Fish and Wildlife 2021).

Common Name	Scientific Name	Status[a] Federal/State	Range and General Habitat Description	Potential for Occurrence
Pallid bat	*Antrozous pallidus*	–/SSC	Occurs throughout California; associated with deserts, grasslands, shrublands, woodlands, and forests. Most common at elevations below 6,000 feet, although it has been observed at higher elevations. Occurs in open, dry habitats and is a year-round resident through most of the range; roosts in crevices in rocky outcrops and cliffs, caves, mines, trees, and various human-made structures; tends to day roost and night roost in alternate structures.	Moderate to high. Could roost in a variety of land cover types in the study area; most of study area provides suitable foraging habitat. One known occurrence from 1999 within 0.25 mile of RBPP and two occurrences that are approximately 3.5 miles east 4 miles north of the RBPP (California Department of Fish and Wildlife 2021).
Townsend's big-eared bat	*Corynorhinus townsendii*	–/SSC	Occurs throughout California, with the exception of the highest elevations in the Sierra Nevada range. Associated with inland deserts; cool, moist coastal redwood forests; oak woodlands of the coastal ranges and Sierra Nevada foothills; and lower to mid-elevation mixed coniferous-deciduous forests. Roosts primarily in abandoned mines and natural caves, but also roosts in human-made structures and hollow trees.	Moderate. There are no known occurrences reported within 5 miles of the study area, but the species could roost in buildings and other structures in the study area.

Common Name	Scientific Name	Status[a] Federal/State	Range and General Habitat Description	Potential for Occurrence
Silver-haired bat	*Lasionycteris noctivagans*	–/–	Occurs throughout portions of California, primarily in the coastal and montane forests from the Oregon border south along the coast to San Francisco Bay, and along the Sierra Nevada and Great Basin region to Inyo County. Has also been recorded in Monterey, Sacramento, Stanislaus, Ventura, and Yolo Counties and during migration may be found throughout the state. Associated with coastal and montane coniferous forests, valley foothill woodlands, pinyon-juniper woodlands, and valley foothill and montane riparian habitats. Roosts in hollow trees, snags, buildings, rock crevices, caves, and under bark and occasionally under wood piles, in leaf litter, under foundations, and in buildings and mines.	Low to moderate. Could migrate through or occasionally occur in the study area but is not anticipated to reside in the study area. One known occurrence from 1999 within 0.25 mile of RBPP (California Department of Fish and Wildlife 2021).
Western red bat	*Lasiurus blossevillii*	–/SSC	Occurs throughout most of California; associated with forests and woodlands and appears to prefer open habitats or habitat mosaics. Roosts in tree foliage and prefers roost sites that are protected from above and open below, and may choose roost sites based on higher foliage density. Associated with intact riparian habitat (particularly willows, cottonwoods, and sycamores) but also has been found in orchard trees.	Moderate to high. Could roost in a variety of land cover types in the study area; most of study area provides suitable foraging habitat. One known occurrence from 1999 within 0.25 mile of RBPP and one occurrence from 1999 that is approximately 3.5 miles east of RBPP (California Department of Fish and Wildlife 2021).
Hoary bat	*Lasiurus cinereus*	–/–	Occurs throughout California. Associated with woodlands and forests, thought to prefer open habitats or habitat mosaics, with access to trees for roosting and open areas or habitat edges for foraging. Roosts primarily in the foliage of medium to large deciduous or coniferous trees.	Moderate to high. Could roost in a variety of land cover types in the study area; most of study area provides suitable foraging habitat. Two known occurrences from 1999 that are approximately 0.25 mile and 3.5 miles from the RBPP (California Department of Fish and Wildlife 2021).

Common Name	Scientific Name	Status[a] Federal/State	Range and General Habitat Description	Potential for Occurrence
Long-eared myotis	*Myotis evotis*	–/–	Occurs throughout most of California but is thought to avoid the Central Valley and hot deserts. Associated with woodland, forest, and brush habitats, coniferous woodlands and forests seem to be preferred. Roosts under exfoliating tree bark, on the ground, and in hollow trees, tree snags, buildings, bridges, caves, mines, cliff crevices, sinkholes, and rocky outcrops.	Low to moderate. Could migrate through or occasionally occur in the study area but is not anticipated to reside in the study area. One known occurrence from 1999 that is approximately 3.5 miles east of the RBPP (California Department of Fish and Wildlife 2021).
San Joaquin pocket mouse	*Perognathus inornatus inoratus*	–/–	Occurs throughout the San Joaquin Valley and part of the Sacramento Valley. Favors grasslands, savanna, and desert scrub habitats with fine textured soils.	Low. Suitable habitat is present, but study area is on the edge of the subspecies' known range. Two historical (1912 and 1929) occurrences within the inundation area (California Department of Fish and Wildlife 2021).
American badger	*Taxidea taxus*	–/SSC	Throughout California, except for the humid coastal forests of northwestern California in Del Norte and northwestern Humboldt Counties. Occurs in a wide variety of open, arid habitats but are most commonly associated with grasslands, savannas, and mountain meadows near timberline. Requires sufficient food (burrowing rodents), friable soils, and relatively open, uncultivated ground.	Low to moderate. Suitable habitat in the study area. No known occurrences within 5 miles of the study area (California Department of Fish and Wildlife 2021).

Common Name	Scientific Name	Status[a] Federal/State	Range and General Habitat Description	Potential for Occurrence
Ringtail	*Bassariscus astutus*	–/FP	Little information on distribution and abundance. Apparently occurs throughout the state; usually found at elevations from sea level to about 500 feet. Occurs primarily in riparian habitats but may also be found in chaparral, chaparral interspersed with evergreen woodland, oak woodland, and other scrub types with scattered boulder and/or rock outcrops. In the Central Valley, has been found in remnant stands of riparian forests bordering waterways and not associated with valley oak woodland.	Low. No known occurrences within 5 miles of the study area (California Department of Fish and Wildlife 2021). May occur along the Sacramento River but is not anticipated to be present in other portions of the study area.

Table sources: California Department of Fish and Wildlife 2021, U.S. Fish and Wildlife Service 2021, Cornell Lab of Ornithology 2021.

[a] Status Explanations:

Federal:

– = not listed under the federal Endangered Species Act

E = listed as endangered under the federal Endangered Species Act

T = listed as threatened under the federal Endangered Species Act

C = candidate for listing under the federal Endangered Species Act

State:

– = not listed under the California Endangered Species Act

E = listed as endangered under the California Endangered Species Act

T = listed as threatened under the California Endangered Species Act

CE = candidate for listing as endangered under the California Endangered Species Act

FP = California fully protected species

SSC = California species of special concern

Special-Status Plants

Seventy-three special-status plant species occur in or within 10 miles of the study area, based on previous surveys of the study area (references) and searches of the CNDDB (CDFW, 2021) and Inventory of Rare and Endangered Plants (California Native Plant Society, 2020) (Table 1). Previous surveys of the Sites reservoir study area found very limited occurrences of special-status plants (DWR, 2000a; Authority and Reclamation, 2021); however, some species were not fully mapped or were not recognized as having special status at the time of the surveys. Forty species are not expected to occur in the study area because potential habitat is not present (i.e., no serpentine soils, no chaparral or oak woodland). Twelve species have a low potential to occur because potential habitat is present, but no occurrences are known within 5 miles of the study area. Eleven species would have a moderate potential to occur because potential habitat is present and there are occurrences within 5 miles of the study area. Ten species have a high potential to occur because potential habitat is present and there are documented occurrences within the vicinity of the study area.

Table 1 lists the plant species identified from the sources cited above, their status, distribution and habitat requirements, and their potential to occur in the study area. The determinations provided below take into consideration the likelihood of the species to occur in the general project vicinity, the proximity of potentially suitable habitat adjacent to bore locations and geophysical work areas, and the potential for them to be affected by these activities. Many of these species, in particular those that occur in wetlands, are unlikely to occur in the immediate geotechnical and geophysical work areas because of the Environmental Commitments developed for the Project, which are defined in Appendix A of the EA/IS. Specifically, implementing Environmental Commitment 16 (Special-status Plant Species) would establish exclusion zones from which project activities would be excluded.

Additional information is provided in *Special-Status Plants,* for federally-listed plants and for other special-status plants with high potential to be affected by the Proposed Action.

Federally-listed Plants

Keck's Checkerbloom

Keck's checkerbloom (*Sidalcea keckii*) is federally-listed as endangered (65 FR 7764, February 16, 2000). It has no state listing status. The species was thought to be restricted to three sites in Fresno and Tulare counties at the time of its listing, and critical habitat for the species is located in those counties (68 FR 12875-12880, March 18, 2003). Subsequent taxonomic studies have concluded that the species also occurs in the southern inner North Coast Ranges in Colusa, Napa, Solano, and Yolo counties (Hill 2015). There are 16 occurrences reported in the CNDDB (CDFW, 2021). Keck's checkerbloom grows in grasslands and on grassy slopes in blue oak woodland, generally on clay soils, and sometimes on soils derived from serpentinite (CDFW, 2021). Grasslands in the study area are potential habitats for this species.

Botanical surveys of the Sites Reservoir study area were conducted before Keck's checkerbloom was listed and before it was recognized to occur in northern California. Consequently, these surveys identified all checkerbloom plants in the area as fringed checkerbloom (*Sidalcea diploscypha*) (DWR, 2000), a common species that is similar in appearance to Keck's checkerbloom, so that any potential occurrences of Keck's checkerbloom in the survey area were not mapped. Three occurrences of Keck's checkerbloom are known from the project vicinity; the closest occurrence to any of the geotechnical sites is three to four miles west of the Bridge Pier and Saddle Dam LaGrande test sites.

Palmate-bracted Bird's-beak

Palmate-bracted bird's-beak (*Chloropyron palmatum*) is federally listed as endangered (51 FR 23769, July 1, 1986). It is also state-listed as endangered. No critical habitat has been designated for this species. The species is known from twenty-five occurrences, eight of which are extirpated or possibly extirpated (CDFW, 2021). These occurrences are present at widely separated locations in the Central Valley, ranging from Glenn County to Fresno County. Habitat for the species is iodine bush scrub and alkaline meadow.

Palmate-bracted bird's-beak was not found in the Sites Reservoir study area (DWR, 2000), although ten occurrences are present in the project vicinity within 10 miles (CDFW, 2021). None of the geotechnical work areas are located within iodine bush scrub or alkaline meadow.

Colusa Grass

Colusa grass (*Neostapfia colusana*) is federally-listed as threatened (62 FR 14338, March 26, 1997). It is also state-listed as endangered. Critical habitat for the species was designated in 2006 (71 FR 7248-7257, February 10, 2006). The species is known from 64 occurrences in the Central Valley, ranging from Glenn County to Merced County (CNDDB 2019). Habitat for the species consists of large, deep vernal pools.

Colusa grass was not found in the Sites Reservoir study area (DWR, 2000), and no habitat for the species was observed. One occurrence in the project vicinity is located within five miles of the pipeline Geotech survey sites, but this occurrence is regarded as extirpated (CDFW, 2021). None of the geotechnical work areas are located within vernal pools.

Greene's tuctoria

Greene's tuctoria (*Tuctoria greenei*) is federally-listed as endangered ((62 FR 14338, March 26, 1997). It is also state-listed as rare. Critical habitat for the species was designated in 2006 (71 FR 7301-7313, February 10, 2006). The species is known from 50 occurrences on the Modoc Plateau and in the Central Valley, ranging from Modoc County to Tulare County (CDFW, 2021). Habitat for the species consists of large, deep vernal pools.

Greene's tuctoria was not found in the Sites Reservoir study area (DWR, 2000), and no habitat for the species was observed. One occurrence in the project vicinity is located within ten miles of the pipeline Geotech survey sites, but this occurrence is regarded as possibly extirpated (CDFW, 2021). None of the geotechnical work areas are located within vernal pools.

Hairy Orcutt Grass

Hairy Orcutt grass (*Orcuttia pilosa*) is federally-listed as endangered (62 FR 14338, March 26, 1997). It is also state-listed as endangered. Critical habitat for the species was designated in 2006 (71 FR 7269-7278, February 10, 2006). The species is known from 35 occurrences in the Central Valley, ranging from Tehama County to Madera County (CDFW, 2021). Habitat for the species consists of large, deep vernal pools.

Hairy Orcutt grass was not found in the Sites Reservoir study area (DWR, 2000), and no habitat for the species was observed. Five occurrences in the project vicinity are located within five miles of the study area and one other occurrence within ten miles (CDFW, 2021). None of the geotechnical work areas are located within vernal pools.

Other Special-status Plants

Other special-status plants that not federally listed but are rare and may face some degree of threat. The following species have a high potential to occur in the study area because there are habitats present that may be suitable for the species and because they are known to occur within or near the study area.

Adobe Navarretia

Adobe navarretia (*Navarretia nigelliformis* subsp. *nigelliformis*) has no federal or state listing status but has a California Rare Plant Rank of 4.2. It is known from scattered populations in the South Coast Ranges, Sierra Nevada Foothills, Sacramento Valley, and interior North Coast Ranges. Habitat for the species

includes clay flats and vernal pools on clay soils. Grasslands in the study area are potential habitat for this species.

Adobe Navarretia was recorded on the Sites Reservoir study area species list, but because it was not recognized as a special-status species at the time of the surveys, it was not mapped (DWR, 2000). However, it was collected at multiple locations within the Sites Reservoir study area, including the vicinities of Antelope Valley, Sites, Grapevine Creek, Golden Gate, Road 69, and the TCC (Consortium of California Herbaria, 2019).

Bent-flowered Fiddleneck

Bent-flowered fiddleneck (*Amsinckia lunaris*) has no federal or state listing status but has a California Rare Plant Rank of 1B.2. The species is known from 95 occurrences in the North Coast Ranges and San Francisco Bay Area (CDFW, 2021). Habitat for the species includes grasslands and grassy areas within oak woodlands and coastal bluff scrub. Grasslands in the study area are potential habitat for this species.

Bent-flowered fiddleneck was not observed in the Sites Reservoir study area survey (DWR, 2000), but it was later collected near Sites, in the hills north of Sites-Ladoga Road, in the Antelope Valley, near Stone Corral Creek, and near Grapevine Creek (CDFW, 2021).

Fairy Candelabra

Fairy candelabra (*Androsace elongata* subsp. *acuta*) has no federal or state listing status but has a California Rare Plant Rank of 4.2. It is known from scattered locations throughout California, below 4,000 feet elevations. It grows on moss-covered rock outcrops and open areas in the adjacent grasslands. Grasslands and rock outcrops in the study area are potential habitat for this species.

Bent-flowered fiddleneck was reported to occur in the Sites Reservoir study area (DWR, 2000), and it was collected near Sites, in the hills north of Sites-Ladoga Road, and near Antelope Valley, Stone Corral Creek, and Grapevine Creek (California Consortium of Herbaria, 2019).

Hoary Navarretia

Hoary navarretia (*Navarretia eriocephala*) has no federal or state listing status but has a California Rare Plant Rank of 4.2. It occurs in the Sierra Nevada Foothills and inner North Coast Ranges, where it grows in vernally moist areas in grasslands and oak woodlands. Grasslands in the study area are potential habitat for this species.

Hoary navarretia was reported to occur in the Sites Reservoir study area (DWR, 2000), and it has been collected near Sites and the Antelope Valley (California Consortium of Herbaria, 2019).

Parry's Rough Tarplant

Parry's rough tarplant (*Centromadia parryi* subsp. *rudis*) has no federal or state listing status but has a California Rare Plant Rank of 4.2. It occurs at lower elevations in the North Coast Ranges, in the Sacramento Valley, and in the northern San Joaquin Valley. It grows in seasonal alkaline wetlands.

Parry's rough tarplant was not observed in the Sites Reservoir study area (DWR, 2000), but it was later collected between Funks Reservoir and the TCC (California Consortium of Herbaria, 2019). None of the geotechnical work areas are located within alkaline wetlands.

Red-flowered Bird's-foot Trefoil

Red-flowered bird's-foot trefoil (*Acmispon rubriflorus*) has no federal or state listing status but has a California Rare Plant Rank of 1B.2. It is known from only eight scattered occurrences in the Cascade Range Foothills, inner North Coast Ranges, and the south San Francisco Bay Area. Habitat for the species is in grasslands and in grassy areas within oak woodlands. Grasslands in the study area are potential habitat for this species.

Red-flowered bird's-foot trefoil was not observed in the Sites Reservoir study area (DWR, 2000), but it was later collected in areas near Sites, Antelope Valley, Grapevine Creek, and Sites-Ladoga Road (CDFW, 2021).

Shining Navarretia

Shining navarretia (*Navarretia nigelliformis* subsp. radians) has no federal or state listing status but has a California Rare Plant Rank of 1B.2. It occurs primarily in the South Coast Ranges but has been reported from other widely scattered locations in the San Joaquin Valley, San Francisco Bay Area, and interior North Coast Ranges. It occurs in moist areas with heavy clay soils, including wetland swales and clay flats in grasslands and oak woodlands. Grasslands in the study area are potential habitat for this species.

Shining navarretia was not observed in the Sites Reservoir study area (DWR, 2000), but it was later collected along Sites-Ladoga Road between Sites and Grapevine Creek (CDFW, 2021).

Special-Status Animals

Forty-two special-status animal species occur in or within 5 miles of the study area, based on previous surveys of the study area (CDFG, 2003a, 2003b; DWR, 2003), a query of the USFWS Information for Planning and Consultation database (USFWS, 2021), and searches of the CNDDB (CDFW, 2021) (Table 2). Previous amphibian, avian, call back, mammal, and elderberry surveys of the Sites Reservoir study area found very limited occurrences of special-status animals.; however, not all of the parcels within the reservoir footprint were surveyed (CDFG, 2003a, 2003b; DWR, 2003). Seven species are not expected to occur in the study area because potential habitat is not present (i.e., no estuarine habitat, no suitable nesting and foraging habitat). Seven species have a low potential to occur because potential habitat is present, but no occurrences are known within 5 miles of the study area. Thirteen species have a moderate potential to occur because potential habitat is present and there are occurrences within 5 miles of the study area. Twenty-three species have a high potential to occur, because potential habitat is present and there are documented occurrences within the study area.

Table 2 lists the species identified from the sources cited above, their status, distribution and habitat requirements, and their potential to occur in the study area. The determinations on the potential for species to occur in the study area in Table 2 take into consideration the likelihood of the species to occur in the general project vicinity, the proximity of potentially suitable habitat adjacent to bore locations and geophysical work areas, and the potential for the species to be affected by these activities.

Additional information is provided in *Special-Status Animals,* for federally-listed animals and for other special-status animals with high potential to be affected by the Proposed Action.

Special-Status Fish

Based on the species list, the following special-status fish species are known to occur in the vicinity of the study area. These include:

- Southern Distinct Population Segment of North American Green Sturgeon
- Sacramento River Winter-Run Chinook Salmon
- Central Valley Spring-Run Chinook Salmon
- Central Valley Fall- and Late Fall-Run Chinook Salmon
- Central Valley Steelhead
- White Sturgeon
- Hardhead
- Sacramento Splittail
- Sacramento Hitch
- Pacific Lamprey
- Western River Lamprey

However, as work would not occur within water or the bank of aquatic resources, fish species are not discussed further in this report.

Special-Status Wildlife

Valley Elderberry Longhorn Beetle

Valley elderberry longhorn beetle is federally listed as threatened. The presumed historical range and current range of the species extends throughout the Central Valley. The range extends approximately from Shasta County south to Fresno County, including the valley floor and associated lower foothills (USFWS 2017). The majority of valley elderberry longhorn beetle have been documented below 500 feet (152 meters) in elevation (USFWS, 2017).

Valley elderberry longhorn beetle is dependent on its host plant, elderberry shrubs, which is a common component of riparian corridors and adjacent upland areas (non-riparian vegetative communities) in the Central Valley (Barr 1991). Elderberry shrubs can be found on historic floodplain terraces above the river, on levees, and areas where subsurface flow provides water to elderberry roots (U.S. Fish Wildlife Service 2017). In non-riparian settings, elderberry shrubs can occur singly or in clumps in valley oak and blue oak woodlands and annual grasslands (U.S. Fish Wildlife Service, 2017).

The species has four life stages: egg, larva, pupa, and adult. Females deposit eggs on or adjacent to the host elderberry. Eggs hatch within a few days of being deposited. Larvae emerge and bore into the wood of the elderberry, creating a long feeding gallery in the pith of the stem. The larvae feed on the elderberry pith for 1 to 2 years. When a larva is ready to pupate, it chews an exit hole to the outside of the stem and then plugs it with frass (wood shavings). The larva then retreats into the feeding gallery and constructs a

pupal chamber from the wood and frass. The larvae metamorphose between December and April; the pupal stage lasts about one month. The adult remains in the chamber for several weeks after metamorphosis and then emerges from the chamber through the exit hole. Adults emerge between mid-March and mid-June, the flowering season of the elderberry. Adults feed on elderberry leaves and mate within the elderberry canopy (Talley et al. 2006).

Elderberry shrubs are present throughout the Sites Reservoir study area, some with exit holes, but none occur within the study area (DWR, 2000b). Seven CNDDB occurrences for valley elderberry longhorn beetle occur within 5 miles of the study area (CDFW, 2021).

Conservancy Fairy Shrimp

Conservancy fairy shrimp is federally listed as endangered. Currently, the species is found in 10 populations in – Butte, Tehama, Glenn, Placer, Yolo, Solano, Stanislaus, Merced, and Ventura counties (USFWS, 2012).

Conservancy fairy shrimp primarily occurs in large turbid vernal pools (playa pools) that stay inundated for much longer than typical vernal pools, often into summer (Eriksen and Belk 1999, USFWS 2012). Conservancy fairy shrimp has been found in vernal pools on a variety of landforms, geologic formations, and soil types (U.S. Fish and Wildlife, 2005) and within a wide elevation range (16 to 5,577 feet) (Eriksen and Belk, 1999). Conservancy fairy shrimp rarely co-occurs with vernal pool fairy shrimp and California fairy shrimp (*Linderiella occidentalis*) and generally greatly outnumbers these species when they do co-occur (Eriksen and Belk, 1999).

Similar to other vernal pool branchiopods, Conservancy fairy shrimp is adapted to the environmental conditions of its ephemeral vernal pool habitats. These adaptations include the ability of fairy shrimp cysts to remain dormant in the soil when vernal pool habitats are dry. Fairy shrimp are also able to complete their lifecycle (from cyst hatching to reproducing) within the relatively short time period when vernal pools are inundated with water (USFWS, 2005). Differences in the rate of maturation and reproduction of vernal pool branchiopods are thought to be the result of variations in water temperature (Helm, 1998).

Suitable habitat for Conservancy fairy shrimp is present within the Sites Reservoir study area but not within 250 feet of the proposed investigations. One CNDDB occurrence has been reported within 5 miles of the study area (CDFW, 2021). The majority of geotechnical locations are located in annual grasslands or oak woodlands with the exception of one located within an area mapped as a potential seasonal wetland and an additional 39 within 250 feet of other potetential seasonal wetlands. Of the 100 geophysical survey lines, approximately 15 cross over the same general area of the 39 subsurface work areas affecting the same potential seasonal wetlands. Based on Google Earth and National Agriculture Imagery Program aerial imagery review over the last 35 years across all seasons at these locations, none of the mapped seasonal wetlands had prolonged inundation, a habitat requirement to support vernal pool branchiopods. Of the 39 subsurface work areas within 250 feet of potential seasonal wetlands, approximately 14 are proposed along existing roadways, six have already been confirmed during the 2020 field effort conducted in the winter and early spring months as unsuitable for vernal pool branchiopods due to the lack of inundation, and two are located on opposite hillsides where surface flows would drain away from potential seasonal wetlands. Thus, 56 percent of the proposed work areas would have no effect on local surface hydrology of potential seasonal wetlands mapped in the vicinity. The majority of the potential wetland areas mapped are gently or moderately sloping based on the review of topography maps of the region (NAIP, 2010) and therefore likely to undergo flash flow conditions after precipitation

leaving the ground surface saturated for prolonged periods during the wet season, but not inundated. In addition, multiple features have existing stock ponds within them (both up- and down-stream of the work areas) further indicating that these features have an altered hydrology regime currently that would decrease the likelihood of prolonged inundation downstream. With saturated and moist soils, ephemeral wetland vegetation is typically present and can be seen on aerial imagery in the late winter and spring months only during 2010 (NAIP, 2010) and 2016 (Google Earth, 2016). From this review, it is concluded that the seasonal wetlands mapped would be unlikely to support vernal pool branchiopods and therefore it is assumed that these locations are not in or within 250 feet of vernal pool branchiopod occupied habtiat.

Vernal Pool Fairy Shrimp

Vernal pool fairy shrimp is federally listed as threatened. The species is currently found in fragmented habitats across the Central Valley of California from Shasta County to Tulare and Kings Counties, in the central and southern Coast Ranges from Napa County to Los Angeles County, and inland in western Riverside County, California (USFWS 2005, 2007a). The historical distribution of vernal pool fairy shrimp likely matched the historical distribution of vernal pools in California's Central Valley and southern Oregon. Although the current range is similar to the historic range, remaining populations are much more fragmented and isolated than prior to widespread agricultural conversion (USFWS, 2005).

Vernal pool fairy shrimp commonly inhabit vernal pools or vernal pool-like habitats, typically in grassland landscapes. Most commonly, vernal pool fairy shrimp are found in vernal pools or vernal swales in unplowed grasslands (Eng et al. 1990). The chemical composition of the habitat and temperature variations resulting from pools filling at different times, and the distribution of pools along altitudinal and longitudinal gradients are the most important factors in determining the distribution of different species fairy shrimp (including vernal pool fairy shrimp), or their appearance from year to year (Eng et al. 1990; USFWS 2007a). Vernal pool fairy shrimp sometimes occur in other wetlands that provide habitat characteristics similar to those of vernal pools; these other wetlands include alkaline rain pools, rock outcrop pools, and some disturbed and constructed sites, including tire ruts, ditches, and puddles (59 FR 48136–48153, September 16, 1994; Eriksen and Belk 1999; Helm 1998; USFWS 2007a). Occupied habitats range in size from 6-square-foot puddles to pools exceeding 24 acres (Eriksen and Belk, 1999). Vernal pool fairy shrimp is not found in riverine, marine, or other permanent waters (USFWS, 2007a). Suitable pools must stay inundated long enough for the shrimp to complete their life cycle.

Vernal pool fairy shrimp matures very quickly and is able to have multiple clutches of eggs per lifespan (Eriksen and Belk, 1999). In a study using large plastic pools to simulate natural vernal pools, Helm (1998) found that vernal pool fairy shrimp reached maturity in an average of 18 days following hatching and reproduced an average of 40 days after hatching. Differences in the rate of maturation and reproduction of vernal pool branchiopods are thought to be the result of variations in water temperature (Helm, 1998).

As noted above for Conservancy fairy shrimp, suitable habitat for vernal pool fairy shrimp is present within the Sites Reservoir study area but not within 250 feet of the proposed investigations. One CNDDB occurrence is within 5 miles of the study area (CDFW, 2021).

Vernal Pool Tadpole Shrimp

Vernal pool tadpole shrimp is federally listed as endangered. The historical range of vernal pool tadpole shrimp likely consisted of the Central Valley and Central Coast regions of California (USFWS, 2005).

Currently, vernal pool tadpole shrimp occurs sporadically in the Central Valley from Shasta County to northwestern Tulare County and San Francisco Bay area (USFWS 2007b; 2005). The greatest number of vernal pool tadpole shrimp occurrences is in Sacramento County (USFWS, 2007b).

Vernal pool tadpole shrimp occurs in a variety of seasonal habitats, including vernal pools and other seasonal pools, ponded clay flats, roadside ditches, and stock ponds (Helm 1998; Rogers 2001). Habitats where vernal pool tadpole shrimp have been observed range in size from small (less than 25 square feet), clear, vegetated vernal pools to large (more than 80 acres) winter lakes (Helm 1998). Vernal pool tadpole shrimp produce cysts (eggs) that lie in the soil until the next winter rains trigger the eggs to hatch (USFWS, 2007b).

In the laboratory, vernal pool tadpole shrimp eggs collected from dry pond sediments at the end of summer hatched in 17 days (Ahl, 1991). In a study using large plastic pools to simulate natural vernal pools, Helm (1998) found that vernal pool tadpole shrimp reached maturity in an average of 38 days following hatching and reproduced an average of 54 days after hatching (Helm, 1998). Differences in water temperature, which strongly effects the growth rates of aquatic invertebrates, may cause variation in rates of growth and maturation (USFWS, 2005). Vernal pool tadpole shrimp can produce additional eggs during the wet season that hatch without going through a dormant period (Ahl, 1991).

While vernal pool tadpole shrimp is adapted seasonal habitats, it has a relatively long lifespan compared to other large branchiopods (USFWS, 2005). In Helm's study (1998), vernal pool tadpole shrimp lived an average of 143 days. The long lifespan of vernal pool tadpole shrimp is attributed to its ability to tolerate drying pool conditions and warm water (Helm, 1998). Vernal pool tadpole shrimp feed on both living organisms, such as fairy shrimp and other invertebrates, and on detritus (USFWS, 2007c).

As noted above for Conservancy fairy shrimp, suitable habitat for vernal pool tadpole shrimp is present within the Sites Reservoir study area but not within 250 feet of the proposed investigations. One CNDDB occurrence for tadpole shrimp is within 2 miles of the study area. There are five CNDDB occurrences within 5 miles of the study area (CDFW, 2021).

Monarch Butterfly

Monarch butterfly is a candidate for listing under the federal Endangered Species Act. The geographic range for monarch butterfly in California is throughout the state and includes spring and summer breeding areas and overwintering areas; the overwintering areas are almost entirely along the coast. Coastal California is considered critical for overwintering populations, and the Central Valley is considered a critical breeding area for this species (Western Association of Wildlife Agencies 2019:34).Generally, the migratory and breeding habitat for this species consists of all areas with the required habitat, including milkweeds, nectar sources, and roosting structures. Overwintering habitat consists of groves of trees that produce the necessary microclimate for survival. Most overwintering sites in California are within 1.5 miles of the Pacific Ocean or San Francisco Bay (Western Association of Wildlife Agencies 2019:8). Monarch butterfly requires milkweed for breeding, as it lays eggs on the milkweed plant, and milkweed is an obligate species for the monarch caterpillar (Western Association of Wildlife Agencies 2019:8, U.S. Fish and Wildlife Service 2020:8).

Monarch butterfly requires nectar-producing plants for foraging and roosting sites (particularly during fall migration) (Western Association of Wildlife Agencies 2019:8; U.S. Fish and Wildlife Service 2020:9–10). Native and nonnative deciduous and evergreen trees, and narrow-leaved trees such as willows, Russian olive, locusts, pines, and eucalyptus are used as roosting sites (U.S. Fish and Wildlife Service 2019).

There are no recorded CNDDB occurrences of monarch butterfly within 5 miles of the study area (California Department of Fish and Wildlife 2021), but this species is considered present in most of California. Potentially suitable monarch butterfly habitat consists of annual grassland, blue oak woodland, chamise chaparral, ditch, ephemeral stream, foothill pine, forested wetland, freshwater marsh, hayfield (includes alfalfa), intermittent stream, managed wetland, mixed chaparral, oak savanna, ornamental woodland, perennial stream, pond, reservoir, ruderal, scrub-shrub wetland, seasonal wetland, and upland riparian land cover types. Proposed investigations occur within or close proximity to suitable habitat, including, but not limited to annual grassland, blue oak woodland, seasonal wetland, and upland riparian habitat.

Crotch Bumble Bee and Western Bumble Bee

Crotch bumble bee and western bumble bee (are candidates for state listing as endangered. In California, Crotch bumble bee historically occurred on the Pacific Coast and in the western desert, Central Valley, and adjacent foothills (Williams et al. 2014:114–116, 132). The known range of western bumble bee extends throughout California, although populations from Central California to the southern British Columbia border have declined sharply since the late 1990s, particularly from lower elevation sites (Williams et al. 2014:116, Hatfield et al. 2015b). Western bumble bee populations are currently largely restricted to high elevation sites in the Sierra Nevada (The Xerces Society for Invertebrate Conservation 2018:6).

Crotch bumble bee forages and nests in open grasslands and scrub habitats in California (The Xerces Society for Invertebrate Conservation 2018:32). Crotch bumble bee is a generalist forager that feeds on a variety of widely distributed plant genera including Antirrhinum, Asclepias, Phacelia, Chaenactis, Clarkia, Dendromecon, Eriogonum, Eschscholzia, Lupinus, Medicago, and Salvia (Koch et al. 2012:82, Williams et al. 2014:132).

Western bumble bee habitat varies widely and includes open grassy areas, urban parks and gardens, chaparral and scrub lands, and mountain meadows (Williams et al. 2014:116). The western bumblebee is a generalist forager that is most commonly associated with taxa such as Asteraceae, Ceanothus, Centaurea, Chrysothamnus, Cirsium, Eriogonum, Geranium, Grindelia, Lupinus, Melilotus, Monardella, Rubus, Penstemon, Solidago, and Trifolium (Williams et al. 2014:116, The Xerces Society for Invertebrate Conservation 2018:34).

Nest sites vary by species and available habitat. Nests may be located underground in abandoned holes made by ground squirrels, mice, and rats; abandoned bird nests; in tufts of grass; or in empty cavities. Woody cover, or other sheltered areas also provide sites for bumble bees to build nests (e.g., downed wood, rock walls, brush piles) (The Xerces Society for Invertebrate Conservation 2018:30). Crotch bumble bees are known to nest underground (The Xerces Society for Invertebrate Conservation 2018:32), and western bumble bees are known to nest mostly underground but have been documented nesting above ground (The Xerces Society for Invertebrate Conservation 2018:34).

Information is lacking for overwintering habitats of most bumble bee species, but generally bumble bees are thought to overwinter in soft, disturbed soil or under leaf litter or other debris (The Xerces Society for Invertebrate Conservation 2018:33,34).

There are no CNDDB records for occurrences of western bumble bee within 5 miles of the study area. Potentially suitable Crotch bumble bee and western bumble bee habitat consists of annual grassland, chamise chaparral, mixed chaparral, oak savanna, seasonal wetland, and ruderal areas when they are

adjacent to these land cover types. Proposed investigations occur within or close proximity to suitable habitat, including, but not limited to annual grassland, oak savannah, ruderal areas, and seasonal wetlands.

California Tiger Salamander

California tiger salamander is listed as a federally and state threatened species. The species occurs from Yolo County south to Kern County in the Central Valley, the Sierra Nevada foothills from Amador County to Tulare County, and from Sonoma County south to Santa Barbara County on the coast.

The species utilizes both aquatic and terrestrial habitat and spend the vast majority of its life underground. Adult California tiger salamander migrate from underground refuge to aquatic breeding habitat during rainy nights, typically from November through April, although migrating adults have been observed in October and in May (Trenham et al. 2000). Metamorphosed juveniles generally leave breeding ponds in late spring to early summer (May to July) and move to terrestrial refuge sites (Trenham et al. 2000); timing of movement is based on local environmental conditions. Breeding habitat includes ponds (natural and man-made), vernal pools, and other seasonal or permanent water bodies that are typically inundated during winter rains and hold water for a minimum of 12 weeks during an average rainfall year (California Department of Fish and Game, 2010). The larval stage of the California tiger salamander lasts 3 to 6 months, with metamorphosis taking place in late spring or early summer (Petranka, 1998). California tiger salamander can be found in permanent ponds, but permanent aquatic sites are less likely to be used for breeding unless they lack fish predators or breeding bullfrog populations (Jennings and Hayes 1994; Shaffer et al. 1993). The species is not known to breed in streams or rivers, however breeding populations have been reported in ditches with seasonal wetlands and in slow-moving swales and creeks near other suitable breeding habitat (Seymour and Westphal 1994; Alvarez et al. 2013). California tiger salamanders also require dry-season refuge sites in the vicinity of breeding sites (generally within 1 mile) (Jennings and Hayes, 1994). California ground squirrel burrows are important refuge sites for adults and juveniles, but the species is also known to use pocket gopher burrows (Loredo et al. 1996; Trenham and Shaffer 2005). Upland habitat surrounding known California tiger salamander breeding pools are typically characterized by grassland, oak savanna or oak woodland. California tiger salamander have been reported to migrate up to 1.3 miles (2.2 kilometers) between breeding ponds and upland habitat (Orloff, 2007). Searcy and Shaffer (2011) estimated average migration distances to be 1,844 feet (562 meters) with an estimate that 95% of the population occurred within 1.16 miles (1.86 kilometers) of the breeding pond.

The Sites Reservoir Project study area is outside of the species' known range and there are no CNDDB occurrences within 5 miles of the inundation area (CDFW, 2021). California tiger salamanders were not detected within the Sites Reservoir study area during previous surveys (Brown and Yip, 2000; CDFG, 2003a). The nearest record to the proposed reservoir for the species is in Yolo County, west of the proposed Dunnigan Pipeline (CDFW, 2021). Although the Dunnigan Pipeline would be in Yolo County, impacts would be east of the known California tiger salamander population, and suitable habitat for the species does not occur in the pipeline vicinity. Therefore, it is unlikely for California tiger salamander to occur in the study area.

Foothill Yellow-legged Frog

Foothill yellow-legged frog is designated as a California species of special concern in the Northwest/North Coast clade. The species occurs throughout the North and South Coast Ranges, south

to the Transverse Range, across most of northern California to the west slope of the Cascade Range, and south through the foothills of the Sierra Nevada to Kern County (Stebbins and McGinnis, 2012). There are isolated populations in southern California (Stebbins and McGinnis, 2012). The species can occur from elevations from sea level to 6,000 feet above sea level (Stebbins, 2003).

Foothill yellow-legged frog inhabits forest streams and rivers with sunny, sandy, and rocky banks, deep pools, and shallow riffles (Stebbins and McGinnis, 2012). Foothill yellow-legged frogs are active during the day and are typically found basking on the shore or on rocks in streams (Stebbins and McGinnis, 2012). The species breeds from mid-March to early June, usually after the high winter and early spring flows have subsided and less sediment is being transported (Stebbins and McGinnis, 2012). Breeding typically occurs in relatively wide and shallow channels with cobble, boulder, and gravel substrates (Thomson et. al. 2016). Tadpoles have not been found in water colder than 13 °C and prefer temperatures between 16.5 and 22.2 °C (Thomson et. al. 2016). Tadpoles require water for at least 15 weeks to reach metamorphosis, which typically occurs between July and September (Jennings and Hayes, 1994).

Suitable habitat is present along Funks Creek, Stone Corral Cree, and Antelope Creek in the study area. Bird Creek in Yolo County, does not provide suitable habitat for the species. Although, no CNDDB occurrences have been reported for foothill yellow-legged frog within 5 miles of the study area (CDFW, 2021), one individual was detected within the Sites Reservoir project footprint (CDFG, 2003a).

California Red-legged Frog

California red-legged frog is listed as a federally threatened species and is a California species of special concern. The historical range of California red-legged frog generally extends south along the coast from the vicinity of Point Reyes National Seashore, Marin County, California, and inland from the vicinity of Redding, Shasta County, California, southward along the interior Coast Ranges and Sierra Nevada foothills to northwestern Baja California, Mexico (Storer 1925; Jennings and Hayes 1985). The current range is generally characterized based on the current known distribution. While California red-legged frog is still locally abundant in portions of the San Francisco Bay area and the central coast, only isolated populations have been documented elsewhere within the species' historical range, including the Sierra Nevada, northern Coast Ranges, and northern Transverse Ranges (USFWS, 2017b). California red-legged frog is believed to be extirpated from the floor of the Central Valley (USFWS, 2002).

California red-legged frog inhabit marshes, streams, lakes, ponds, and other, usually permanent, sources of water that have dense riparian vegetation (Stebbins, 2003). California red-legged frog primarily breeds in ponds and less frequently in pools within streams (Thomson et al. 2016). Breeding occurs from November through April and red-legged frogs typically lay their eggs in clusters around aquatic vegetation (U. S. Fish and Wildlife Service, 2002). Larvae undergo metamorphosis from July to September, 3.5 to 7 months after hatching (66 FR 14626).

California red-legged frogs often disperse from breeding sites to various aquatic, riparian, and upland estivation habitats in the summer (66 FR 14628), however it is common for individuals to remain in the breeding area year-round (66 FR 14628; Bulger et al. 2003; Fellers and Kleeman, 2007). Adults may take refuge during dry periods in rodent holes or leaf litter in riparian habitats (U. S. Fish and Wildlife Service ,). Within riparian areas, microhabitats utilized by California red-legged frogs include blackberry thickets, logjams, and root tangles (Fellers and Kleeman, 2007).

California red-legged frog will travel through a variety of upland habitat types (e.g., grassland, riparian, woodlands) to reach breeding and nonbreeding sites, upland refugia/foraging habitats, or new breeding

locations (Bulger et al. 2003; Fellers and Kleeman, 2007). Frogs typically travel much shorter distances between aquatic and upland refugia/foraging habitats than when dispersing between breeding and non-breeding aquatic habitats Bulger et al. 2003). In one study, 90% of radio-tagged California red-legged frogs that did not make overland movements (i.e., non-migrating frogs) were found within 200 feet (60 meters) of aquatic habitat throughout the year; the farthest movement was 427 feet {130 meters) from water and was in response to summer rain (Bulger et al. 2003). In another study, a radio-tagged California red-legged frog moved at least 0.9 mile (1 kilometer) and up to 1.7 mile (2.8 kilometers) over several months during the breeding season (Fellers and Kleeman, 2007).

Ponds and streams within the Sites Reservoir study area represent potential habitat for California red-legged frogs. Funks Creek, Stone Corral Creek, and Antelope Creek, all which occur within the study area, are considered to provide potential habitat for California red-legged frog. Bird Creek in Yolo County, does not provide suitable habitat for the species. There are no CNDDB occurrences for California red-legged frog within 5 miles of the study area (CDFW, 2021). The species was not detected during surveys from 1997 to 2001; however, surveys were not conducted during the breeding period and not all properties were accessible at time of the surveys (Brown and Yip, 2000; CDFG, 2003a).

Western Spadefoot Toad

The western spadefoot toad is a California species of special concern. The species occurs in the Sierra Nevada foothills, the Central Valley, the Coast Ranges, and in the non-desert portions of southern California (USFWS, 2005). The elevational range of the species extends from near sea level to 4460 feet (1363 meter) in the southern Sierra foothills (Jennings and Hayes, 1994).

Western spadefoot toad occurs primarily in lowland habitat such as washes, floodplains of rivers, alluvial fans, playas, and alkali flats but are also found in foothills and mountains (USFWS, 2005). It prefers open areas with sandy or gravelly soils (Jennings and Hayes, 1994). Western spadefoot spend most of their life buried underground in earth-filled burrows and are active for only a short period each year, typically between October and May, depending on rainfall. Some individuals use mammal burrows for refuge. Individuals occasionally emerge during rains at other times of the year. The species uses a variety of permanent and temporary wetlands, including rivers, creeks, pools in intermittent streams, stock ponds, vernal pools, and temporary rain pools; however vernal pools and temporary wetlands may be optimal for breeding due to the absence of predators (USFWS, 2005). Typically, breeding waters are turbid with little or no cover. Surface water must last for at least 30 days to allow for successful transformation of larvae. Upland habitat is generally considered to be areas within 850 feet of suitable aquatic habitat (Baumberger, 2013). Most surface movements by adults are associated with rains or high humidity at night (CDFW, 2000). Recently metamorphosed juveniles seek refuge in the immediate vicinity of breeding ponds for up to several days after transformation and dispersal of post-metamorphic juveniles from breeding ponds often occurs without rainfall (CDFW, 2000).

Suitable aquatic habitat for western spadefoot toad, creeks, ponds, and seasonal wetlands, occurs adjacent to the study area and suitable upland habitat occurs in the annual grasslands portions of the study area. Although no CNDDB occurrences have been reported for the species within 5 miles of the study area (CDFW, 2021), western spadefoot toad was detected in the Sites Reservoir study area during previous surveys (CDFG, 2003a).

Western Pond Turtle

Western pond turtle is a California species of special concern. Western pond turtle occurs throughout much of California, except east of the Sierra-Cascade crest and desert regions (with the exception of the Mojave River and its tributaries) (Zeiner et al. 1988).

Aquatic habitats used by pond turtles include ponds, lakes, marshes, rivers, streams, and irrigation ditches with a muddy or rocky bottom in grassland, woodland, and open forest areas (Stebbins 2003). Pond turtles spend a considerable amount of time basking on rocks, logs, emergent vegetation, mud or sand banks, or human-generated debris (Jennings et al. 1992). Pond turtles move to upland areas adjacent to watercourses to deposit eggs and overwinter (Jennings and Hayes 1994). Turtles have been observed overwintering several hundred meters from aquatic habitat. In the southern portion of their range and along the central coast, pond turtles are active year-round. In the remainder of their range, these turtles typically become active in March and return to overwintering sites by October or November (Jennings et al. 1992)

Suitable habitat for western pond turtle occurs in the study area in Funks Creek, Stone Corral Creek, and Antelope Creek and occurs in streams and ponds adjacent to the study area, as well as upland areas within approximately 300 feet, which could be used for nesting. Bird Creek also provides suitable habitat. Pond turtles were observed inside the Sites Reservoir study area (CDFG, 2003a). There is one CNDDB occurrence for western pond turtle within 5 miles of the study area (CDFW, 2021).

Giant Gartersnake

Giant gartersnake is listed as a federally and state threatened species. Historically, giant garter snake was found throughout the Central Valley from Butte County in the north to Kern County in the south. Currently, it is known to occur in nine discrete populations in the Sacramento and San Joaquin Valleys, which includes Butte Basin, Colusa Basin, Sutter Basin, American Basin, Yolo Basin, Cosumnes-Mokelumne Basin, Delta Basin, San Joaquin Basin, and Tulare Basin (USFWS, 2017).

Giant gartersnake has specific habitat needs that include summer aquatic habitat for foraging, bankside basking areas with nearby emergent vegetation for cover and thermal regulations, and upland refugia for extended periods of inactivity (USFWS, 2017). The species inhabits agricultural wetlands and other waterways, including irrigation and drainage canals, rice, marshes, sloughs, ponds, small lakes, and low-gradient streams, as well as adjacent upland areas. Perennial wetlands provide the highest quality habitat for giant gartersnake, and rice with interconnected water conveyance structures, serve as an alternative habitat in the absence of higher-quality wetlands (USFWS, 2017). They do not occur in larger rivers and wetlands with sand, gravel, or rock substrates. Giant gartersnake requires permanent water during its active season (early spring through mid-fall) to maintain dense populations of food organisms. The snake also requires herbaceous, emergent vegetation for protective cover and foraging habitat and open areas and grassy banks for basking. In addition, higher elevation upland habitats for cover and refuge from floodwaters are needed during the winter when the snake is inactive. Riparian woodland generally is considered unsuitable habitat because of the lack of basking sites, excessive shade, and lack of prey. Giant gartersnakes begin to search for mates soon after emergence from overwintering sites. Giant gartersnake is generally active from May 1 to October 1 (USFWS, 1997).

Suitable aquatic habitat is present in ditches, canals, freshwater emergent wetlands, and rice fields within and adjacent to the agricultural portions of the study area located east of the Glenn-Colusa Irrigation District Main Canal in Colusa County and east of I-5 in Yolo County along the Dunnigan Pipeline

corridor. Suitable upland habitat includes annual grassland, ruderal areas, and canal banks within 200 feet of suitable aquatic habitat. There are thirty giant gartersnake CNDDB occurrences within 5 miles of the study area, several overlap with the study area near Colusa Basin Drain and the proposed Dunnigan Pipeline (CDFW, 2021).

Golden Eagle

Golden eagle is a California Fully Protected Species. The species is found throughout North America, but more common in western North America. Golden eagle is found throughout California in rolling foothills, mountain areas, sage-juniper flats, and desert (Zeiner et al. eds. 1990).

The species nests on secluded cliffs and escarpments or in tall trees overlooking open country and forages in annual grasslands, chaparral, and oak woodlands with plentiful medium and large-sized mammals; however, the species does not nest in the Central Valley (Zeiner et al. eds. 1990). Nesting occurs from late January through August.

Suitable foraging habitat for golden eagle is present in grasslands in the study area. Although, no CNDDB occurrences have been reported for golden eagle within 5 miles of the study area (CDFW, 2021), the species has been observed during avian surveys at Funks Reservoir and the Sites Reservoir study area (DWR, 2000c). A golden eagle was also observed in flight and foraging over the study area on January 31, 2019.

Swainson's Hawk

Swainson's hawk is listed as threatened in California. The species is found in the Sacramento and San Joaquin Valleys, Klamath Basin, and Butte Valley. The highest nesting density of Swainson's hawk occurs near Davis and Woodland in Yolo County. The majority of Swainson's hawks winter in South America. Swainson's hawk arrives in California in early March to establish nesting territories and breed (California Department of Fish and Game 1994).

Swainson's hawk usually nest in large, mature trees. Most nest sites (87%) in the Central Valley are found in riparian habitats (Estep 1989), primarily because trees are more available there. Swainson's hawks also nest in mature roadside trees and in isolated trees in agricultural fields or pastures. The breeding season is from March through August (Estep 1989). Swainson's hawks forage in grasslands, grazed pastures, alfalfa and other hay crops, and certain grain and row croplands. Vineyards, orchards, rice, and cotton crops are generally unsuitable for foraging because of the density of the vegetation (California Department of Fish and Game 1992). The species' diet in California mainly consists of small rodents, but birds and insects are also taken.

Suitable nesting habitat is present in the study area in riparian areas and isolated trees in agricultural areas. Suitable foraging habitat exists throughout the study area. There are 25 CNDDB occurrences of Swainson's hawk reported within 5 miles of the study area (CDFW, 2021).

Northern Harrier

The northern harrier is a California species of special concern. The range of northern harrier encompasses all of lowland California, but this species has been observed at high elevations. It breeds in California from sea level up to 5,700 feet in the Central Valley and Sierra Nevada, and up to 3,600 feet in northeastern California (Shuford and Gardali, 2008). The Central Valley region supports the majority of nesting harriers in California. Harriers occur year-round within its breeding range in California. The

species appears to be nomadic, ranging widely within the breeding season and across years (Shuford and Gardali, 2008).

Northern harriers breed and forage in a variety of open (treeless) habitats that provide adequate vegetative cover, and abundance of suitable prey, and scattered hunting, plucking, and lookout perches such as shrubs and fence posts. In California, this species inhabits annual and perennial grasslands, wet meadows, marshes (freshwater, brackish, saltwater), and seasonal and agricultural wetlands. Harriers nests on the ground within a thicket of vegetation, frequently in wet areas including meadows. It forages primarily for small mammals over open habitats, including grassland, tidal salt marsh, and agricultural fields (Shuford and Gardali, 2008).

Suitable nesting and foraging habitat for northern harrier is present in and adjacent to the study area. Although no CNDDB occurrences for northern harrier have been reported within 5 miles of the study area (CDFW, 2021), the species was observed during avian surveys near Funks Reservoir and near cultivated lands within the study area, detection was highest during the winter (DWR, 2000c).

White-tailed Kite

White-tailed kite is a California fully protected species. White-tailed kite is a yearlong resident in coastal and valley lowlands, west of the Sierra Nevada from the head of the Sacramento Valley south to western San Diego County at the Mexico border. The species is found year-round throughout the Sacramento Valley (Zeiner et al. 1990).

White-tailed kites generally inhabit low-elevation grassland, savannah, oak woodland, wetland, agricultural, and riparian habitats. Some large shrubs or trees are required for nesting and for communal roosting sites. Nest trees range from small, isolated shrubs and trees to trees in relatively large stands (Dunk, 1995). White-tailed kites make nests of loosely piled sticks and twigs lined with grass and straw, near the top of dense oaks, willows, and other tree stands. The breeding season lasts from February through October and peaks from May to August. They forage in undisturbed, open grassland, meadows, farmland, and emergent wetlands where voles and mice are common prey species (Zeiner et al. 1990).

Nesting habitat is present along creeks and in isolated trees within grassland and cultivated lands in the study area. Kites were observed during avian surveys in dense, un-grazed grassland and adjacent fallow agricultural lands at Funks Reservoir during the winter, and limited kite observations were made during the avian breeding season within the Sites Reservoir study area (DWR, 2000c). One CNDDB occurrence within 5 miles of the study area (CDFW, 2021).

Mountain Plover

Mountain plover is a California species of special concern (California Department of Fish and Wildlife 2021b). The geographic range of mountain plover in California consists of the Central Valley from Sutter and Yuba Counties southward, San Joaquin Valley, Imperial Valley, Los Angeles and western San Bernardino Counties, and the central Colorado River valley. There have also been more recent records for occurrences of the species along the northern coast of California (California Department of Fish and Game 2008). California is thought to be the main wintering area for mountain plover, but they do not breed within the state (Andres and Stone 2009).

Nonbreeding, winter habitat for mountain plover consists of grasslands, agricultural pastures and fields, and open sagebrush areas (California Department of Fish and Game 2008, Andres and Stone 2009:12). In the Central Valley, the species is found on short grasslands and plowed fields. Mountain plover often

roosts in depressions such as ungulate hoof prints and plow furrows. The diet of mountain plover includes large insects, especially grasshoppers, which are eaten from the ground (California Department of Fish and Game 2008).

Mountain plover nests outside of California in dry grasslands and shrub-steppe tablelands (Andres and Stone 2009:10). The breeding season is from late April through June, with a peak in late May (California Department of Fish and Game 2008).

There are three CNDDB records for occurrences of wintering flocks within 5 miles of the Dunnigan Pipeline portion of the study area (California Department of Fish and Wildlife 2021a). Potentially suitable mountain plover wintering habitat consists of annual grassland, hayfield (includes alfalfa), row crops, and seasonal wetland land cover types.

annual grassland, hayfields, ruderal, disturbed, and developed land cover types.

Bald Eagle

Bald eagle is listed as endangered in California and is also a fully protected species. Bald eagle is a permanent resident and uncommon winter migrant in California (Zeiner et al. 1990). Nests in Siskiyou, Modoc, Trinity, Shasta, Lassen, Plumas, Butte, Tehama, Lake, and Mendocino counties and in the Lake Tahoe Basin. Reintroduced into central coast. Winter range includes the rest of California, except the southeastern deserts, very high altitudes in the Sierra Nevada, and east of the Sierra Nevada south of Mono County (Zeiner et al. 1990)

The species breeds at coastal areas, rivers, lakes, and reservoirs with forested shorelines or cliffs in northern California. Wintering bald eagles are associated with aquatic areas containing some open water for foraging. Bald eagles nest in trees in mature and old growth forests that have some habitat edge and are somewhat close (within 1.25 miles) to water with suitable foraging opportunities. Although nests can be closer, the average distance of bald eagle nests to human development and disturbance is more than 1,640 feet (Buehler, 2000). In California, the breeding season lasts from about January through July or August (Zeiner et al. 1990). After fledging, young migrate to northern and western Canada before returning to California. California resident breeding pairs remain in California during the winter. Migratory bald eagles from northwestern states and other provinces winter in California and have remained into April. Bald eagles consume a variety of small animals, usually fish or waterfowl, carrion, deer, and cattle.

Suitable nesting and foraging habitat for bald eagle is present in the study area. Sporadic wintering use by adult and immature bald eagles has been documented at Funks Reservoir and in the Sites Reservoir study area, with the highest wintering use at Funks Reservoir (DWR, 2000c). No nesting attempts were observed during previous surveys (DWR, 2000c). One CNDDB occurrence has been reported within 5 miles of the study area (CDFW, 2021).

Western Burrowing Owl

Burrowing owl is a California species of special concern. The species is found throughout California and is a year-round resident in the Central Valley, San Francisco Bay Area, Carrizo Plain, and Imperial Valley (Shuford and Gardali, 2008).

The species occur primarily in level, open low-stature grassland or desert habitats but may also occur in landscapes that are highly altered by human activity, such as ruderal, agricultural, and developed lands

(e.g. on edges of agricultural fields, canal banks, along railroad track berms). Suitable habitat must contain burrows with relatively open, short vegetation and minimal amounts of shrubs or taller vegetation. Burrowing owl most commonly nest and roost in California ground squirrel burrows, but may also use burrows dug by other species, as well as utilize culverts, piles of concrete rubble, and pipes, and other tunnel-like structures (Haug et al. 1993). The breeding season is March to August but can begin as early as Febr,uary. During the breeding season, owls forage near their burrows but have been recorded hunting up to 1.7 miles away (Shuford and Gardali 2008).

The species has been observed in the Sites Reservoir study area (DWR, 2000c). Twelve CNDDB occurrences for burrowing owl are within 5 miles of the study area, one of which is located approximately 1.4 miles east of Funks Reservoir (CDFW, 2021).

Song Sparrow (Modesto population)

The Modesto population of song sparrow is a California species of special concern. Song sparrow is resident throughout California, excluding high elevation locations and most parts of the southern deserts (Zeiner et al. 1990). The Modesto song sparrow is endemic to the north-central portion of the Central Valley, with the highest densities occurring in the Butte Sink area of the Sacramento Valley and the Sacramento-San Joaquin River Delta (Shuford and Gardali, 2008). Song sparrow occurs in low densities at Delevan and Colusa National Wildlife Refuges (Shuford and Gardali, 2008).

This species requires moderately-dense cover for nest sites and occurs in early successional riparian forest, and in permanent and seasonal wetlands with emergent marsh vegetation (i.e., tules [Scirpus spp.] and cattails [*Typha* spp.]). It also nests in riparian thickets of willows, shrubs, vines, tall herbs, and in fresh or saline emergent vegetation (Zeiner et al. 1990) and nests in riparian forest of valley oak with an understory of blackberry and along vegetated irrigation canals and levees. Modesto song sparrow breeds from mid-March to early August. The species is omnivorous, foraging on the ground and in leaf litter for seeds and invertebrates (Shuford and Gardali, 2008).

Suitable foraging habitat is present for Modesto song sparrow in the study area and suitable nesting habitat occurs in areas adjacent to the study area. Two CNDDB occurrences have been reported within 5 miles of the study area (CDFW, 2021).

Tricolored Blackbird

Tricolored blackbird is listed as threatened in California. Tricolored blackbird is a highly colonial species that is largely endemic to California. The species is a permanent resident in the Central Valley from Butte County to Kern County. Also occurs in the surrounding foothills of California. Tricolored blackbird breed in scattered coastal locations from Marin County south to San Diego County and at scattered locations in Lake, Sonoma, and Solano counties. The species is a rare nester in Siskiyou, Modoc, and Lassen counties.

Tricolored blackbird breeding colony sites require open, accessible water; a protected nesting substrate, including either flooded, thorny, or spiny vegetation; and a suitable foraging space providing adequate insect prey within a few miles of the nesting colony. Tricolored blackbird breeding colonies occur in freshwater marshes dominated by tules and cattails, in Himalayan blackberry, and in silage and grain fields (Beedy and Hamilton, 1997). Breeding habitat must be large enough to support 50 pairs. The breeding season is from late February to early August (Meese et al. 2014). Some individuals will reside in the Central Valley throughout the year, whereas other migrate from their first nesting site in the San Joaquin Valley to a second nesting site located in more Northern regions, such as the Sacramento Valley,

northeast California, and southern Oregon (Beedy and Hamilton 1997).Tricolored blackbird foraging habitats in all seasons include annual grasslands, dry seasonal pools, agricultural fields (such as large tracts of alfalfa with continuous mowing schedules, and recently tilled fields), cattle feedlots, and dairies. Tricolored blackbirds also forage occasionally in riparian scrub habitats and along marsh borders. Weed-free row crops and intensively managed vineyards and orchards do not serve as regular foraging sites. Most tricolored blackbirds forage within 3 miles of their colony sites but commute distances of up to 8 miles have been reported (Beedy and Hamilton 1997).

Suitable nesting and foraging habitat for tricolored blackbird is present the study area in freshwater marsh, annual grasslands, and agricultural areas. The species was observed in the Sites Reservoir study area during the spring, although the observations were sporadic and limited (DWR, 2000c). Thirty-seven CNDDB occurrences within 5 miles of the study area, several of which are in close proximity to the study area (CDFW, 2021).

Yellow-breasted Chat

Yellow-breasted chat is a California species of special concern. An uncommon summer resident and migrant in coastal California and in foothills of the Sierra Nevada. The species is uncommon along the coast of northern California east to Cascade Range and occurs south of Mendocino County. The species can occur up to 4800 feet (1450 meter) in valley foothill riparian, and up to 6500 feet (2050 meter) east of the Sierra Nevada in desert riparian habitats (CDFW, 2005). In migration, the yellow-breasted chat can be found at lower elevations of mountains in riparian habitat.

The species occupies early successional riparian habitats with well-developed shrub layer and an open canopy. Vegetation structure is an important factor in nest-site selection. Nesting habitat is usually restricted to a narrow boarder of streams, creeks, sloughs, and rivers, and seldom forms an extensive track (Shuford and Gardali, 2008). Areas with blackberry, wild grape, and willow, other plants that form a dense tangle are preferred. Chats will nest in non-native vegetation that provide dense shrub layers. Breeds from late April through early August. The yellow-breasted chat is a rare or absent as a breeder in much of the Central Valley and parts of the southern coastal slope but do nest regularly along low- and mid-elevation streams in the Sierra Neva (Shuford and Gardali, 2008). Yellow-breasted chat forage on insects and spiders, wild fruit and berries.

Suitable nesting and foraging habitat is generally absent in the study area. There are no CNDDB occurrences for yellow-breasted chat in the study area (CDFW, 2021). No yellow-breasted chat were observed during avian surveys (DWR, 2000c). Suitable nesting habitat is absent on the west bank of the Sacramento River, but nesting could occur on the east bank of the Sacramento River.

Yellow Warbler

Yellow warbler is a California species of special concern. It is a migrant and summer resident in California from late March through early October. The species is found in coastal and northern California and the Sierra Nevada below approximately 7,000 feet. It is largely extirpated from the Sacramento Valley, Sacramento-San Joaquin River Delta, and San Joaquin Valley region. Yellow warbler nests from Del Norte County east to Modoc plateau and south along the coast to Ventura County, and on western slope of Sierra Nevada.

Yellow warblers are found in riparian vegetation near streams and wet meadows. They are typically found in willows and cottonwoods, and in California they are found in a variety of other riparian shrub and tree species. The breeding season is from April through late July (Shuford and Gardali, 2008). Nests are

generally placed 2–16 feet above the ground in young deciduous trees or in shrubs (Zeiner et al. 1990). They will make several attempts at nesting throughout the season, but typically only produce one group of hatchlings per year (Shuford and Gardali, 2008). A generalist, the yellow warblers will consume a variety of invertebrates.

Suitable yellow warbler nesting and foraging habitat is generally absent in and adjacent to the study area. There is one CNDDB occurrences for yellow warbler within 5 miles of the study area (CDFW, 2021). Yellow warbler was not detected during avian transects in the study area (DWR, 2000c). There is a low potential for the species to occur on the west bank of the Sacramento River, but nesting could occur on the east bank of the Sacramento River.

Bank Swallow

Bank swallow is a California threatened species. It is a neo-tropical migrant that inhabits riparian and other lowland habitats in California west of the deserts in the spring and fall. The species is less common on the coast, and uncommon and local summer resident. When present, bank swallows can occur along the Sacramento River from Tehama County to Sacramento County, along the Feather and lower American rivers, in the Owens Valley, and in the plains east of the Cascade Range in Modoc, Lassen, and northern Siskiyou counties. Small populations are also located near the coast from San Francisco to Monterey and San Mateo Counties (Zeiner et al. 1990).

Bank swallows nest in burrows in erodible soils on vertical or near-vertical banks and bluffs in lowland areas dominated by rivers, streams, lakes, and oceans. Bank swallows generally dig new burrows each year, especially if the bank or cliff face used for nesting the previous year collapsed from erosion or human activities and no old burrows remain. They breed from April through July and depart for wintering grounds in South America between mid-August and mid-September. Foraging habitats include lakes, ponds, rivers and streams, meadows, fields, pastures, and occasionally forest and woodlands. The bank swallow is an aerial feeder, taking flying or jumping insects from dawn to dusk (Garrison, 1999).

There are fourteen CNDDB records for bank swallow, all along the Sacramento River within 5 miles of the study area. An occurrence within the vicinity of the study area, is located on the eastern bank of the Sacramento River at Mile 154.7-157.3. Bank swallows surveys within the Sites Reservoir study area failed to detect signs of nesting swallows (DWR, 2000c).

Western Red Bat

Western red bat is a California species of special concern. It is found throughout much of California at lower elevations, from Shasta County south to the Mexico border, west of the Sierra Nevada and Cascade crest and deserts. The species winters in western lowlands and coastal regions south of the San Francisco Bay area. During migration (in the spring), the species can be found outside the normal species' range.

Western red bat are primarily associated with riparian and wooded habitats, but also occurs seasonally in urban areas (Brown and Pierson, 1996). Western red bats day roost in the foliage of trees that are often located on the edge of habitats adjacent to streams, fields, or urban areas. They have been found in fruit orchards and sycamore riparian habitats in the Central Valley. This species breeds in August and September, and young are born in May through July (Zeiner et al. 1990). Female may move the young between roost sites. Western red bat forages over a wide variety of habitats including grasslands, shrublands, open woodlands, and forests (Zeiner et al. 1990). The bats forage on a variety of insects with the most important prey item being moths, crickets, beetles, and cicadas.

Suitable roosting and foraging habitat for western red bat is present in the study area. There are two CNDDB records within 5 miles of the study area (CDFW, 2021). A breeding population of western red bats was documented within the Sites Reservoir study area (CDFG, 2003b).

Pallid Bat

Pallid bat is a California species of special concern and is considered. In California, 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 at low and mid-elevations.

Pallid bat tend to inhabit foothills and lowlands near water throughout California below 6,562 feet (2000 meters). Pallid bats use a wide variety of habitats (e.g., desert, grassland, scrubland, woodland, forest) but are most common in open, dry areas with rock outcrops or cliffs. The species prefers rocky outcrops, cliffs, and crevices for roosting with access to open habitats for foraging. They are a yearlong resident in most of their range and hibernate in winter near their summer roost (Zeiner et al.1990). Day roosting sites include caves, crevices, mines, and occasionally in hollow trees and buildings; roosts must be protective from high temperatures. Night roosts may be in more open sites such as porches and open buildings (Zeiner et al. 1990). Mating takes place from late October to February and maternity colonies form in early April. Young are born from April to July, with most in May to June. Young are capable of flight by July and August. Pallid bats are also very sensitive to roost site disturbance. The bats are opportunistic generalists that eat a variety of arthropod prey; they rarely eat small reptiles, rodents, and plant material.

Suitable roosting and foraging habitat for Pallid bat is present adjacent to the study area. Three CNDDB occurrences have been reported within 5 miles of the study area (CDFW, 2021). The species was observed at Sites Reservoir study area and was the most commonly mist netted bat species during mammal surveys and a breeding population of pallid bats was documented within the general Sites Reservoir study area (CDFG, 2003b).

Spotted Bat

Spotted bat is a California species of special concern. It is a broadly distributed species, but rarely common and rare in California. They have been found at sea level to 10,000 feet (3,000 meter) elevation, occurring from arid low desert habitats to high elevation conifer forests.

Spotted bat have been found in vegetation that range from desert to sub-alpine meadows, woodland, mixed conifer forest, canyon bottoms, riparian areas, fields, and open pasture. Prominent rock features appear to be necessary for roosting. The species appears to be solitary, but occasionally roost or hibernate in small groups. Roost sites are cracks, crevices, and caves, usually high in fractured rock cliffs (Western Bat Working Group 2005). Spotted bats breed in late summer with females pupping in early summer (May or June). Spotted bats primarily forage on moths over water or washes.

Suitable roosting habitat for spotted bat is present adjacent to the study area. There are no CNDDB occurrences for spotted bat within 5 miles of the study area (CDFW, 2021). The species was not observed or caught during mammal surveys within the Sites Reservoir study area (CDFG, 2003b).

Townsend's Big-eared Bat

Townsend's big-eared bat is a California species of special concern. Townsend's big-eared bat occurs throughout California from sea level to 10,900 feet in elevation, but the species' distribution appears to be limited by the availability of cavern-like roost structures. Formerly common in California, but the species is now considered uncommon.

Townsend's big-eared bats are found in all but subalpine and alpine habitats and may be found at any season throughout its range. The species uses a wide variety of habitats from desert to riparian and coastal woodland, but they are found in greatest numbers in mesic habitat with cavern-forming rock or abandoned mines (Western Bat Working Group, 2005). Townsend's big-eared bats roost in dome-like spaces in caves, tunnels, or mines, where they roost hanging in the open from the ceiling. They also have been known to use human-made structures that are cavern-like spaces in abandoned buildings or bridges, and in the basal hollows in large coast redwood trees (Mazurek, 2004). Mating occurs in fall and spring, and pups are born in late spring to early summer (Pierson and Rainey, 1998). Maternity roost size varies and may contain only a few or up to several hundred individuals. Maternity roosts are found in caves, tunnels, mines, and buildings. The species is believed to be relatively sedentary, hibernating in caves and mines near summer maternity roosts, although seasonal movements are not well understood. Townsend's big-eared bats may have hibernated historically in aggregations of thousands of individuals (Pierson and Rainey, 1998). They are highly sensitive to disturbance at roost sites (Brown and Pierson, 1996). Small moths are the principal food of the species, but it will also consume soft-bodied insects.

Potential roosting habitat for Townsend's big-eared bat is present adjacent to the study area. There are no CNDDB occurrences within 5 miles of the study area (CDFW, 2021). The species has not been observed or caught during mammal surveys at the study area (CDFG, 2003b).

Western Mastiff Bat

Western mastiff bat is a California species of special concern. It is found along the west side of the Sierra Nevada Mountains at low to mid-elevations from the southern California border north to a few miles south of the Oregon border (Brown and Pierson 1996; Western Bat Working Group 2005). The western mastiff bat is an uncommon resident in southeastern San Joaquin Valley and Coastal Ranges from Monterey County southward through southern California, from the coast east to the Colorado Desert. The species is uncommon in the Central Valley. The winter range includes western lowlands and coastal regions of the Bay Area.

Mastiff bats are found in a variety of open habitats including desert scrub, chaparral, annual and perennial grasslands, conifer and deciduous woodlands, coastal scrub, montane coniferous forest and urban. Day roosting sites consist of crevices in cliff faces, cracks in boulders, and occasionally buildings (Brown and Pierson, 1996). Tunnels and trees are also used for roosting. They emerge from roost sites just after dark (Western Bat Working Group, 2005b). Western mastiff bats generally roost in groups of less than 100 individuals and young are born in June or July (Brown and Pierson, 1996). They appear to be periodically active during the winter and do not go through extended hibernation (Western Bat Working Group, 2005). Mating generally occur in the spring and pupping may occur from early April through August or September. The species forages in a wide variety of habitats including grasslands, shrublands, open woodland and forests, and croplands. The western mastiff bat feeds on a variety of insects, with moth, crickets, beetles, and cicadas being the most important.

The species roost sites are primarily associated with crevices in cliff faces and boulders, which don't occur in the study area and are limited in the vicinity of the study area. One CNDDB occurrence for western mastiff bat is within 5 miles of the study area (CDFW, 2021). The species was not observed or caught during mammal surveys at the study area (CDFG, 2003b).

American Badger

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 (Zeiner et al. 1990).

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, which are used for cover and reproduction (Zeiner et al. 1990). They frequently reuse old burrows, although some may dig a new den each night, especially in summer (Messick and Hornocker, 1981). Dens area usually located in sandy soil in areas with sparse overstory cover. Mating takes place in the summer and early fall with litters generally born in March and April. Young are born in burrows dug in dry, often sandy, soil. Badgers are carnivorous and eat fossorial rodents (especially ground squirrels and pocket gophers) and some reptiles, insects, eggs, birds, and carrion; their diet shifts seasonally and yearly in response to availability of prey. They are active yearlong, and day and night (Zeiner et al. 1990).

Suitable habitat for American badger is present in the annual grassland within study area. Although, there are no CNDDB occurrences within 5 miles of the study area (CDFW, 2021), the species was observed within Sites Reservoir study area (CDFG, 2003b).

Other Protected and Managed Biological Resources

Game Fish

Based on the species list, the following game fish species are known to occur in the vicinity of the study area. These include:

- Striped Bass
- American Shad
- Black Bass

However, as in-water work would not occur (including the banks of aquatic resources), game fish species are not discussed further in this report

Migratory Birds

Non-special-status migratory birds, including raptors, have the potential to nest in trees, shrubs, and ground vegetation in and adjacent to geotechnical and geophysical work areas. For example, the riparian corridor along Funks, Stone Corral, and Antelope creeks provide suitable nesting habitat for various birds and raptors. Although these species are not considered special-status wildlife species, their occupied nests

and eggs are protected by California Fish and Game Code Sections 3503 and 3503.5 and by the Federal Migratory Bird Treaty Act (see Appendix B, *Regulatory Setting, Permits, and Authorizations* of the EA/IS).

Waters of the U.S./State

Potential waters of the U.S./State occur throughout the study area. These areas consist of freshwater marsh, seasonal wetlands, ponds, Funks Reservoir, and various waterways, including Funks Creek, Stone Corral Creek, Antelope Creek, Bird Creek, and some canals and ditches, and takes into consideration the State Water Resources Control Board's recently adopted wetland definitions (see Appendix B, *Regulatory Setting, Permits, and Authorizations*, in the EA/IS for more detail).

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Appendix B. Standard Protocols and Procedures Incorporated into the Proposed Project

B.1 Standard Protocols and Procedures and Mitigation Measures Tracking Program

The Authority and Reclamation developed the following Standard Protocols and Procedures and Mitigation Measures Tracking Program to keep a record of all of the Proposed Action commitments that are presented in the Draft EA/IS. The standard protocols and procedures are incorporated into the Proposed Action and will be implemented prior to and throughout the proposed investigations. The standard protocols and procedures represent best management practices, best available technology practices, regulatory requirements, industry safety measures, and fire safety measures that are commonly implemented and incorporated into the Proposed Action. The Authority and Reclamation along with the Proposed Action contractor will be responsible for carrying out these standard protocols and procedures. The standard protocols and procedures differ from the mitigation measures presented in the Draft EA/IS since they are not precipitated from a potential Proposed Action impact. The standard protocols and procedures are provided in Table B-1 along with the timing, duration, and responsibilities for implementation.

The mitigation measures for sensitive resources, biological resources, paleontological resources, cultural resources, and tribal cultural resources from the Draft EA/IS are provided in Table B-2. This table also identifies the timing, duration, and responsibilities for implementation for each mitigation measure.

Table B-1. Standard Protocol and Procedures

Title	Description	Timing	Duration	Responsibility
Stormwater Pollution Prevention Plan , Erosion Control and Investigation-derived Waste BMPs	The Proposed Action may be subject to stormwater permit and dewatering requirements of the federal Clean Water Act National Pollutant Discharge Elimination System program. The Authority and Reclamation may be required to obtain permits through the Central Valley Regional Water Quality Control Board before any ground-disturbing activity occurs. The geotechnical investigation work plan documents will identify BMPs for field activities to prevent and minimize the introduction of investigation-derived waste materials and contaminants into surface waters. BMPs specific to each investigation location will be identified following an initial site visit. In addition, at a minimum, the BMPs identified below will be implemented as necessary during Proposed Action field activities. • Temporary erosion control measures (e.g., silt fencing, weed-free straw bale barriers, fiber rolls, storm drain inlet protection, hydraulic mulch, and stabilized entrances) would be employed for disturbed areas (graded or vegetation completely removed; does not apply to vegetation trimming). • No investigation-derived materials will be left at the investigation sites following completion of work. If no suitable upland disposal location is located nearby (i.e., one that would not result in discharges to sensitive aquatic resources including habitat of listed aquatic or semi-aquatic species), investigation-derived groundwater generated during field activities would be contained onsite within approved containers or tanks to avoid impacts on surface waters. Management of the stored or upland disposed groundwater will be completed in accordance with waste management practices or managed in accordance with Order R5-2016-0076-01 for Limited Threat Discharges to Surface Water or *General Waste Discharge Requirements for Discharges to Land with a Low Threat to Water Quality* 2003- 003-DWQ, as applicable.	Prior to investigations	Throughout the investigation period	Authority and Reclamation's representative and primary contractor
Spill Prevention and Hazardous Materials Management	Hazardous materials and hazardous wastes including fuels, oils, grease, and lubricants may be used and stored during the field investigation. These materials would be used, stored, and disposed of in accordance with applicable regulations. Spill prevention and control BMPs would be followed to minimize effects from spills of hazardous or petroleum substances. Spill prevention kits would be located onsite at each investigation point. For fueling and maintenance of equipment, containments would be provided to the degree that any spill would not enter the watershed or riparian vegetation. Equipment would not be serviced within or near waterways or floodplains, unless the equipment stationed in these locations could not be readily relocated (e.g., pumps and generators). Additional BMPs designed to avoid spills from equipment would also be implemented. These would include the following: • Storing hazardous materials in double containment • Disposing all hazardous and nonhazardous products in a proper manner • Monitoring onsite vehicles for fluid leaks and providing regular maintenance to reduce the chance of leakage • Providing containment (a prefabricated temporary containment mat, a temporary earthen berm, or other measure that could provide appropriate containment) of bulk storage tanks having a capacity of more than 55 gallons. In addition, existing federal, State, and local worker safety and emergency response regulations require that if any unforeseen hazardous conditions are discovered, the contractor should coordinate with the appropriate agencies, including Glenn, Colusa, and Yolo Counties, for the safe handling, sampling, transportation, and disposal of encountered materials. The contractor would also be required to comply with California Occupational Safety and Health Administration's worker health and safety standards that ensure safe workplaces and work practices.	Prior to investigations	Throughout the investigation period	Authority and Reclamation's representative and primary contractor
Reduce Fugitive Dust from Field Equipment Usage and Driving	Field activities would include the following measures to reduce fugitive dust and vehicle exhaust emissions: • Water would be applied by means of truck(s), hoses, and/or sprinklers as needed to minimize dust emissions. • Haul vehicles would be covered. • All earth-moving activities would be suspended when average wind speeds exceed 25 miles per hour. • All visibly dry, disturbed, unpaved road surface areas of operation would be watered to minimize dust emissions. • Onsite vehicles would be limited to a speed of 15 miles per hour on unpaved roads. • Unpaved haul roads which are in use would be sprayed down at the end of the work shift to form a thin crust. This application of water would be in addition to the minimum rate of application.	Prior to investigations	Throughout the investigation period	Authority and Reclamation's representative and primary contractor
Implement Measures to Reduce Equipment and Vehicle Exhaust Emissions	Measures to reduce equipment and vehicle exhaust emissions to be implemented for the Proposed Action would include the following to reduce nitrous oxides, particulate matter less than 10 microns in aerodynamic diameter, and reactive organic gas emissions: • All construction-type equipment would be maintained according to manufacturer's specifications. • Idling times would be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California Airborne Toxics Control Measure, codified in Title 13, Section 2485 of the *California Code of Regulations*). • During all activities, diesel-fueled portable equipment with maximum power greater than 25 horsepower would be registered under the California Air Resource Board's Statewide Portable Equipment Registration Program. • All fleets of diesel-fueled off-road vehicles and equipment would comply with emissions standards and requirements pursuant to *California Code of Regulations* Title 13, Section 2449. To the extent feasible, off-road Proposed Action vehicles and equipment with engines certified to the Tier 3 or	Prior to investigations	Throughout the investigation period	Authority and Reclamation's representative and primary contractor

	higher emissions standards would be operated. If off-road Proposed Action vehicles and equipment with engines that meet Tier 3 or 4 standards are not available, the best available emissions control technology would be used. • All diesel-fueled on-road trucks would be operated in compliance with the emission standards in accordance with *California Code of Regulations* Title 13, Section 2025. To the extent feasible, on- road trucks with engines certified to the 2012 model year or newer heavy-duty diesel engine emissions standards would be operated. • To the extent feasible, electric equipment would be operated. • Alternatively-fueled equipment would be used, to the extent feasible, such as compressed natural gas, liquefied natural gas, propane, or biodiesel.			
Traffic Management and Hazards	The following measures would be implemented to reduce roadway and traffic conflicts in and near the Proposed Action Area: • Identify specific haul and access routes with all contractors when multiple sites are under evaluation concurrently, so that Proposed Action-generated traffic would be dispersed. • Install traffic control devices, as specified in California Department of Transportation's Manual of Traffic Controls for Construction and Maintenance Work Zones where needed to maintain safe driving conditions, including use of signage to alert motorists of proposed investigations and potential hazards, as well as the use of flaggers when appropriate. • All staging of investigation equipment would be located within existing right-of-way or areas previously approved by property owners.	Prior to investigations	Throughout the investigation period	Authority and Reclamation's representative and primary contractor
Access for Emergency Vehicles	Access for emergency vehicles would be maintained on all roadways throughout the Proposed Action Area. Notification to Yolo, Glenn, and Colusa County police, public works, fire departments, and other public service providers will occur prior to Proposed Action implementation.	Prior to and during investigations	Throughout the investigation period	Authority and Reclamation's representative and primary contractor
Minimize Risk of Exposure to Hazardous Chemicals, Hazardous Materials, and Hazardous Conditions	The work in the field will be completed under numerous safeguards which will be kept in place, and updated as needed, for the duration of the geotechnical investigation phase of the project. Prior to the start of the proposed investigations, the Proposed Action team would evaluate site conditions for the presence of hazardous chemicals, materials, and conditions by reviewing publicly available information and by conducting an initial site visit to observe surface conditions. A health and safety plan (HSP) will then be prepared for the overall investigation. The HSP will include an assessment of known hazards, how to control spills, include the procedures for conducting utility screenings, and include fire hazard precautionary methods to be employed. The HSP also contains a Jobsite Hazard Analysis (JHA) form which will be completed for each work area. The JHA, based on observed conditions and proposed work, will identify potential worksite hazards, observed chemical impacts to soil or groundwater, and will identify areas where chemicals/oils will be onsite associated with field equipment management. Further, a Health, Safety, Security and Environmental Plan (HSSE Plan) Safeguards in the HSSE Plan are focused on minimizing releases while acknowledging that releases may still occur. Safeguards which will be put into place include: daily, work-specific tailgate meetings so safety and protection of the environment are foremost in workers minds; inspections of equipment to confirm they are in working order; use of plastic sheeting placed below all equipment which is stationary; provision of spill kits with instructions on delineation, containment and appropriate actions to be taken if a spill occurs included at each work area; and daily observations of work areas by a qualified environmental practitioner specifically to identify compliance with the applicable procedures, to confirm no releases have occurred, and to ensure that the appropriate protocols are followed in the unlikely event of a release to address and prevent any significant impacts. In the event a release does occur, such as an equipment or product release of lubricant or other fluids, remediation will be implemented immediately by the Authority or its contractors. Remediation could include additional studies, containment and removal, or other actions as defined in the spill kit documentation. Specific reporting	Prior to investigations	Throughout the investigation period	Authority and Reclamation's representative and primary contractor
Unexpected Hazardous Materials	If unexpected hazardous materials or hazardous waste-related structures or conditions are encountered, such as unlisted underground storage tanks, septic tanks, or unreported hazardous materials or wastes, State and county standards would be implemented. This may also be included in the HSP described in Standard Protocol and Procedure: Minimize Risk of Exposure to Hazardous Chemicals, Hazardous Materials, and Hazardous Conditions.	Prior to and during investigations	Throughout the investigation period	Authority and Reclamation's representative and primary contractor
Fire Prevention and Suppression at Investigation Locations	Field activities would include the following measures to prevent wildfires: • Drill site will be kept in neat and clean order. • Flammables will be stored in appropriate containers at all times. • Drilling equipment will have vertical exhaust systems and be diesel powered. • Personnel working or visiting drill sites who smoke will be required to smoke in designated areas and appropriately dispose of any related materials. • Personnel working on site will perform fire prevention and suppression drills at each new drilling location. • Firefighting hand tools and equipment will be available for each crew member. Firefighting equipment will include shovels, axes, and fire rakes; back pack water pumps 5 gallons each – two per site; high pressure water pump and hose; at least 100 gallons of water; fire extinguishers – two 5 pound and one 10 pound. • No welding or cutting torch operations or grinding operations are anticipated at any of the proposed investigation locations. • Site inspections will be performed at the end/shut down of every shift.	Prior to and during investigations	Throughout the investigation period	Authority and Reclamation's representative and primary contractor

Table B-2. Mitigation Measures

Title	Description	Timing	Duration	Responsibility
MM Gen-1: Conduct Pre-Investigation Siting Survey	At least one week prior to mobilization for Proposed Action activities at each investigation location, the Proposed Action contractor and staff, along with a qualified biologist, a cultural resources specialist, and a tribal monitor will conduct a pre-investigation siting survey. Following review of the proposed site locations and investigation plan, the team will conduct a coordinated field survey and provide recommendations to the Proposed Action team to assist in finalizing investigation sites and provide findings as to the extent of the ground surface preparations (if any) that would be needed at each location. The team will also confirm the means of access by personnel and equipment, which includes the biologist, tribal and cultural specialist demarcating the overland access route that avoids impacts to any identified sensitive resources during the siting survey. Adjustments in the exact location of the investigation areas and in the application of species/habitat-specific mitigation measures may be required to avoid or minimize impacts to sensitive resources, to avoid potential utility conflicts, or if specific site conditions are different than anticipated. These adjustments will be limited to the vicinity of the general investigation locations shown in Figure 1-2 and will remain compliant with any permit restrictions placed on specific areas in the Proposed Action Area.	At least one week prior to investigations	One day pre-investigation siting survey for each investigation location	Proposed Action contractor and staff, qualified biologist, cultural resources specialist, and a tribal monitor
MM Gen-2: Reprioritize or Postpone Proposed Investigations if Sensitive Resources Cannot be Avoided	If implementation of MM Gen-1 and species/habitat-specific mitigation measures do not avoid or minimize permanent impacts to sensitive resources, and resource avoidance would require relocation of the investigation location outside of the area where data collection is needed to inform design, then the need for an investigation at that specific location would be re-evaluated as part of the overall Proposed Action investigation plan and, if found to be necessary, the effort would be reprioritized within the Proposed Action schedule to avoid or minimize permanent impacts (e.g., moving investigation to later date in schedule to avoid an active bird nest) or postponed to a subsequent investigation effort that would require separate environmental evaluation and permitting.	At least one week prior to investigations	Determination made after One day pre-investigation siting survey for each investigation location	Proposed Action contractor and staff, qualified biologist, cultural resources specialist, and a tribal monitor
MM Bio-1: Conduct Mandatory Biological Resources Awareness Training	Prior to Proposed Action implementation, a qualified biologist will conduct a mandatory biological resources awareness training for all Proposed Action personnel. A qualified biologist is defined as someone with training, knowledge, and experience with the species this document is concerned with. The training will cover special-status species and their habitats that could be encountered in the Proposed Action area. The training will cover the natural history, appearance (using representative photographs), and legal status of species, regulatory protections, penalties for noncompliance, benefits of compliance, as well as the avoidance and minimization measures to be implemented. Participants will be required to sign a form that states they have received and understand the training. Reclamation will maintain the record of training and make it available to USFWS and CDFW upon request. The Authority-provided biological monitor will verify that the new personnel brought onto the Proposed Action team receive the mandatory training before starting work.	Prior to investigations	Throughout the investigation period	Proposed Action contractor and staff and qualified biologist
MM Bio-2: General Measures to Avoid and Minimize Effects on Sensitive Biological Resources	General restrictions and guidelines that will be followed by personnel are listed below. The contractor and Authority-provided biological monitor will be responsible for ensuring that crew members adhere to these measures. • Qualified biologists (USFWS- and CDFW-approved for giant garter snake and California red-legged frog, see below) will monitor all terrestrial activities. Any observations of federally listed species will be reported to Reclamation and USFWS within 24 hours. Any observations of state listed species will be reported to Authority and CDFW within 24 hours. • Personnel driving vehicles will observe the posted speed limit on paved roads and a 15 mile-per-hour speed limit on unpaved roads, during off-road travel in or adjacent to habitat, and in any areas closed to normal traffic to reduce the risk of take of GGS via vehicle strike during travel in the Proposed Action area. • All project personnel will have stop work authority if a potentially listed species is observed within an active work area. • All food-related trash will be disposed of in closed containers and removed from the work area daily during the work period. Personnel will not feed or otherwise attract fish or wildlife to the work site. • No pets or firearms will be allowed in the Proposed Action area. • Personnel conducting aquatic surveys for amphibians will follow USFWS-approved decontamination protocols prior to any staff entering a wetland or stream (USFWS, 2005a) (see MM Bio-17 below). • All Proposed Action-related equipment will be maintained to prevent leaks of fuels, lubricants, or other fluids. Daily equipment inspections will include inspections for leaks. • Temporary signs, staking, or flagging will be used to identify sensitive biological resources and project personnel will be advised to avoid disturbance of these areas. These areas will be identified during pre-activity surveys. Signs, staking, and flagging will be inspected by the qualified or approved biologist on a daily basis. • Any worker who inadvertently injures or kills a special-status species or finds one dead, injured, or entrapped will immediately report the incident to the Authority-provided biological monitor, who will immediately report the incident to Reclamation. Reclamation will provide oral notification to the USFWS Sacramento Endangered Species Office within 1 working day. Reclamation will follow up with written notification to USFWS within 5 working days. • Vehicles and equipment left on-site overnight will be thoroughly inspected each day for wildlife (both underneath the vehicle and in open cabs) before they are moved. To prevent possible resource damage from hazardous materials such as motor oil or gasoline, personnel will not service or refuel vehicles, equipment, or motorized tools within 300 feet of any aquatic habitat. • Work will be restricted to open areas in riparian habitat and other sensitive natural communities, including woodlands. All work will remain outside of the tree canopy. Additionally, the upper 12 inches of topsoil will be restored at drilled work area within these habitats.	Prior to, and during investigations	Throughout the investigation period, including the pre-investigation siting survey	Proposed Action contractor and staff and qualified biologist

MM Bio- 3: Waters of the U.S./State	The following measures will be implemented to avoid, minimize, and mitigate impacts on wetlands and waters subject to federal and State jurisdiction: • At least 48 hours prior to any ground-disturbing activities, a qualified biologist will ground truth the land cover mapping within proposed investigation areas and staging areas, including areas within 250 feet where accessible (i.e., where access has been granted by the property owner), to confirm the presence and absence of wetlands and waters. All wetlands and waters not previously identified will be mapped in the field using a global positioning system (GPS) with submeter accuracy and will be used to update the land cover mapping. • To the extent practicable, investigations will not take place in or within 250 feet of wetlands and waters (i.e., ponds, streams, reservoirs), except for the investigation sites within Funks Reservoir and the potential jurisdictional water and for activities identified in the Proposed Action description that are near or adjacent to canals and ditches in the agricultural areas. • If work needs to occur within 250 feet of wetlands and waters that are not also restricted by environmental commitments for special-status wildlife species (see MM Bio-4, 5, and 6), the following measures will be implemented: o Sediment control measures: Prevent transport of sediment from work area; Reduce runoff velocity on exposed slopes; and Reduce offsite sediment tracking. o Management measures for investigation materials: Cover and berm loose stockpiled materials; Store chemicals in watertight containers; and Minimize exposure of work materials to stormwater. o Designate refueling and equipment inspection/maintenance locations at least 300 feet from aquatic habitats. A spill prevention plan will be implemented. o A biological monitor will be onsite during all work within 250 feet of waters and wetlands. o In coordination with the Authority provided biological monitor, disturbed areas will be returned to their original condition, which may include the following: – Restoring original topography to the degree possible. – Placement of erosion control BMPs (e.g., wattles, soil binders, straw mulch, geotextiles) may be used to help stabilize work areas once work is complete. – Hydroseeding with noninvasive plant seed.	Prior to, and during investigations	Throughout the investigation period, including the pre-investigation siting survey	Proposed Action contractor and staff, qualified biologist
MM Bio-4: Valley Elderberry Longhorn Beetle	The following measures will be implemented to avoid, minimize, and mitigate impacts on valley elderberry longhorn beetle throughout the Proposed Action Area. o Pre-activity surveys for elderberry shrubs will be conducted in and adjacent to potential work areas by a qualified biologist familiar with the appearance of valley elderberry longhorn beetle exit holes in elderberry shrubs. Pre-activity surveys will be conducted in accordance with the USFWS's 2017 *Framework for Assessing Impacts to the Valley Elderberry* Longhorn *Beetle (Desmocerus californicus dimorphus)*. Any elderberry shrubs in the Proposed Action Area will be mapped. Those shrubs that are within 300 feet of Proposed Action activities will be identified with flagging and protected with high-visibility fencing (at the edge of the work area) and signs indicating the potential for beetle presence and excluding any Proposed Action activity within 165 feet of the plants. o A qualified biologist will be responsible for ensuring the buffer area fences are maintained throughout Proposed Action implementation. o Gravel roadways, staging areas, and other applicable areas will be sprayed with water as needed to minimize dust moving onto elderberry shrubs.	Prior to and during investigations	Throughout the investigation period, including the pre-investigation siting survey	Proposed Action contractor and staff, qualified biologist
MM Bio-5: Vernal Pool Branchiopods	The following measures will be implemented to avoid, minimize, and mitigate impacts on federally listed vernal pool branchiopods. • Prior to any ground-disturbing activities, a qualified biologist will ground truth the land cover mapping that was done for the Proposed Action Biological Assessment within the above identified investigation areas and staging areas, including areas within 250 feet, to confirm the presence or absence of habitat suitable for vernal pool branchiopods. All suitable branchiopod habitat will be mapped in the field using a GPS with submeter accuracy and will be used to update the land cover mapping. Updated maps with exclusion buffers for listed species will be provided to all Proposed Action personnel. • Vehicles and equipment will not travel in identified branchiopod habitat. • Investigations will fully avoid effects on vernal pool branchiopods and their habitat. Full avoidance requires a minimum 250-foot no-disturbance buffer around all suitable habitat potentially supporting vernal pool branchiopods or drainage features feeding or draining these areas. The buffers will be identified with flagging or high- visibility fencing as well as signs identifying it as off limits and protected habitat. • Geophysical activities will not take place within 250 feet of suitable vernal pool branchiopod habitat. All geophysical lines will avoid going through pools that represent potential suitable habitat for these species. • The Authority-provided qualified biologist will ensure that the contractor complies with these avoidance buffers.	Prior to and during investigations	Throughout the investigation period, including the pre-investigation siting survey	Proposed Action contractor and staff, qualified biologist

MM Bio-6: Giant Garter Snake	No work would occur within aquatic habitat for giant garter snake. However, the following measures will be implemented to avoid, minimize, and mitigate impacts on the giant garter snake and its upland habitat. • Prior to any ground-disturbing activities, a qualified biologist will ground truth the land cover mapping that was done for the Proposed Action BA within the above identified investigation areas and staging areas, to confirm the presence or absence of habitat suitable for giant garter snake. In addition, an inspection of all areas within a minimum of 50 feet around the proposed work sites for burrow entrances or other signs of underground refugia will be conducted. As possible, areas near any identified potential refugia within the work area and within the 50-foot buffer will be avoided. All suitable habitat will be mapped in the field using a GPS with submeter accuracy and will be used to update the land cover mapping. Updated maps with exclusion buffers for listed species will be provided to all Proposed Action personnel. • Geotechnical activities will not be conducted in giant garter snake upland habitat during the active giant garter snake season (April through October) to the maximum extent practicable. • No less than 30 days prior to Proposed Action implementation, Reclamation will submit a request for approval of biologists to conduct monitoring and other activities (see below) associated with the giant garter snake in the areas identified above. • A USFWS- and CDFW-approved biologist will survey work areas within 200 feet of giant garter snake aquatic habitat for snakes no more than 24 hours prior to the start of activities. • Movement of heavy equipment will be confined to existing paved and dirt roads and will avoid suitable upland giant garter snake habitat. • A USFWS- and CDFW-approved biologist will be present during all investigation activities taking place within 200 feet of suitable aquatic habitat. The biologist will visually check for giant garter snake under vehicles and equipment prior to contractors moving them. The biologist will ensure that the contractor caps all materials onsite (e.g., conduits, pipe), precluding wildlife from becoming entrapped. The biologist will check any crevices or cavities in the work area where individuals may be present including stockpiles that have been left for more than 24 hours where cracks/crevices may have formed. • If a giant garter snake is observed by the biologist within the work area, all work will cease until the snake has moved out of the work area on its own, and no capture or relocation will be allowed. The observation will be recorded and reported to the USFWS and CDFW within one business day. • All Proposed Action activities adjacent to suitable giant garter snake aquatic habitat will be conducted within paved roads, farm roads, road shoulders, and similarly disturbed and compacted areas without small mammal burrows or other suitable refugia that could be used by giant garter snake. A USFWS- and CDFW-approved biologist will assess the locations of proposed bore holes in order to avoid small mammal burrows. The biologist will ensure that the work area along the geophysical line remains clear of snakes and other wildlife during testing. The USFWS- and CDFW-approved biologist will immediately notify the operator to shut down testing if a snake is seen moving into the work area. Testing will resume once the snake has moved out of the work area on its own. • No Electrical Resistance Survey work will be conducted within 200 feet of giant garter snake aquatic habitat to avoid exposing giant garter snakes to electrical current if they are occupying or passing through uplands.	Prior to and during investigations	Throughout the investigation period, including the pre-investigation siting survey	Proposed Action contractor and staff, qualified biologist
MM Bio-7: California Red-legged Frog	No work would occur within suitable California red legged frog aquatic habitat. If work needs to be conducted within suitable California red-legged frog upland habitat or dispersal habitat (areas within 1 mile of aquatic breeding habitat during the rainy season, generally October 15 to March 31), the following measures will be implemented to avoid, minimize, and mitigate impacts under the guidance of a USFWS- and CDFW-approved biologist. • Prior to any ground-disturbing activities, a qualified biologist will ground truth the land cover mapping that was done for the Proposed Action Biological Assessment within the above identified investigation areas and staging areas to confirm the presence or absence of habitat suitable for California red-legged frog. All suitable habitat will be mapped in the field using a GPS with submeter accuracy and will be used to update the land cover mapping. Updated maps with exclusion buffers for listed species will be provided to all Proposed Action personnel. • A qualified biologist will be present during all investigation activities in California red-legged frog upland habitat and dispersal habitat (if work occurs during rainy season, generally October 15 to March 31 when frogs are dispersing) to implement avoidance and minimize measures for the California red-legged frog. The biologist will survey work areas for frogs and for rodent burrows in potential upland habitat before equipment is moved in and work begins. Areas with higher potential for California red-legged frog, such as areas with a high density of burrows, will be flagged for avoidance. The biologist will work with the geotechnical crew and geologists to align work such that the minimum number of burrows is affected. • The qualified biologist will inspect all equipment left in a work area overnight to ensure that no frogs are present before work begins. Any California red-legged frogs found within a work area will be avoided and allowed to disperse on their own accord. • The qualified biologist will ensure that the work area along the geophysical lines remains clear of frogs and other wildlife during the ERI. The biological monitor will immediately notify the operator to shut down the ERI equipment if a frog, or other special-status wildlife species, is seen moving into the work area. Testing will resume once the frog has moved out of the work area on its own. • No work will occur in the aforementioned work areas during or 24 hours following a rain event. Following a rain event, no work will proceed until a qualified biologist has inspected the work areas and verified that there are no California red-legged frogs present. A rain event is to be considered precipitation of at least one-quarter inch within a 24-hour period. • Activities within suitable upland/dispersal habitat will occur during daylight hours (from 30 minutes before sunrise to 30 minutes after sunset). Except when necessary for driver or pedestrian safety, artificial lighting at a worksite will be prohibited during the hours of darkness when working in suitable California red-legged frog upland/dispersal habitat. • If work in suitable California-red legged frog dispersal habitat occurs during the rainy season, generally October 15 to March 31, and lasts for more than 1 day, exclusion fencing will be installed around the work area. Fencing will remain within the Proposed Action Area at any location and allow enough room for the movement of equipment and personnel. The fencing will be installed to a depth of 6 inches and be at least 36 inches above grade. The	Prior to and during investigations	Throughout the investigation period, including the pre-investigation siting survey	Proposed Action contractor and staff, qualified biologist

	contractor will avoid placing fencing on top of ground squirrel burrows. A qualified biologist will inspect the fencing daily for the presence of California-red legged frogs.			
MM Bio-8: Foothill Yellow-legged Frog	All investigations will be sited outside of foothill yellow-legged frog habitat (i.e., intermittent or perennial streams with moderate gradient and rocky substrates). If work occurs within 300 feet of suitable aquatic habitat, a CDFW-approved biological monitor will conduct a pre-activity survey immediately prior to work crews entering the work area and will remain onsite for the duration of the activities within 300 feet of suitable aquatic habitat. If a frog is observed in a work area, it will be allowed to move out of the work area on its own. Any observed foothill yellow-legged frogs will be reported to CDFW within 24 hours.	Prior to and during investigations	Throughout the investigation period, including the pre-investigation siting survey	Proposed Action contractor and staff, qualified biologist
MM Bio-9: Nesting Birds	The following measures will be implemented to avoid and minimize impacts on nesting birds, including special-status birds, as well as species not specifically protected by the Migratory Bird Treaty Act, during investigations: • A qualified wildlife biologist with experience with nesting birds will conduct nesting surveys before the start of investigation activities during the breeding season (February 1-August 31). A minimum of two separate surveys will be conducted within 14 days prior to the initiation of work, with the last survey within 24 hours prior to work beginning in a given work area. Surveys will include a search of all suitable nesting habitat in the work area. In addition, where accessible, a 0.25-mile radius around the work area will be surveyed for nesting raptors and a 500-foot radius around the work area will be surveyed for other nesting birds. If no active nests are detected during these surveys, no additional measures are required. • If active nests are found in the survey area, no-disturbance buffers will be established around the nest sites to avoid disturbance or destruction of the nest site until the end of the breeding season (approximately August 31) or until a qualified wildlife biologist determines that the young have fledged and moved out of the Proposed Action Area (this date varies by species). A qualified wildlife biologist with appropriate nesting bird experience will monitor activities in the vicinity of the nests to ensure that activities do not affect nest success. The extent of the buffers will be determined by the biologists in consultation with CDFW and will depend on the level of noise or disturbance, line-of-sight between the nest and the disturbance, ambient levels of noise and other disturbances, and other topographical or artificial barriers. Suitable buffer distances may vary between species.	Prior to and during investigations	Throughout the investigation period, including the pre-investigation siting survey	Proposed Action contractor and staff, qualified biologist
MM Bio-10: Bald and Golden Eagles	The following measures will be implemented to avoid, minimize, and mitigate impacts on bald and golden eagles during investigations: • A qualified wildlife biologist with appropriate bald and golden eagle experience will conduct nesting surveys before the start of investigation activities during the breeding season (January 1-August 31). A minimum of two separate surveys will be conducted within 14 days prior to the initiation of work, with the last survey within 24 hours prior to work beginning in a given work area. Surveys will include a search of all suitable nesting habitat in the work area. In addition, where accessible, a 1-mile radius around the work area will be surveyed for nesting bald and golden eagles. • All investigations (surface and subsurface) will be avoided within 0.5 mile of potential bald eagle nests; and 1 mile of golden eagle nests during the nesting season (January to August 31).	Prior to and during investigations	Throughout the investigation period, including the pre-investigation siting survey	Proposed Action contractor and staff, qualified biologist
MM Bio-11: Swainson's Hawk	The following measures will be implemented to avoid, minimize, and mitigate impacts on Swainson's hawk during investigations: • Pre-activity surveys will be conducted by a biologist with experience with Swainson's hawk in order to identify the presence of potential Swainson's hawk nest trees on and within 0.25 mile of work and staging areas. Surveys will be consistent with the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (Swainson's Hawk Technical Advisory Committee, 2000), or as the methodology is modified based on Proposed Action timing. Survey results will be provided to CDFW by phone or e-mail no less than 5 days prior to commencement of activities, and in a written report within 30 days after commencement of activities. The report will include the location of any known nest trees (occupied within one or more of the last 5 years) present within 0.25 mile of the work footprint. • Investigations will fully avoid Swainson's hawk nests. Investigations will not be conducted within 0.25 mile of an occupied Swainson's hawk nest, except in cases where the Project biologist has determined that case-specific circumstances warrant a smaller buffer. A nest is considered occupied from the time the nest is being constructed until the young leave the nest, or until the nesting attempt fails and the nest is abandoned.	Prior to and during investigations	Throughout the investigation period, including the pre-investigation siting survey	Proposed Action contractor and staff, qualified biologist

MM Bio-12: Western Burrowing Owl	The following measures will be implemented to avoid, minimize, and mitigate impacts on western burrowing owl during investigations. These measures incorporate survey, avoidance, and minimization guidelines adapted from CDFW's Staff Report on Burrowing Owl Mitigation (CDFG, 2012). • Pre-activity surveys will be conducted with one occurring 14 days prior to all activities, including staging, and another within 24 hours of these activities within and adjacent to areas of suitable habitat. A qualified biologist will survey the Proposed Action Area and record and map all burrowing owl observations and burrows that may be occupied (as indicated by tracks, feathers, egg shell fragments, pellets, prey remains, cast pellets, whitewash, or decoration) on the Proposed Action Area. The surveys will be conducted while walking transects throughout the proposed investigations areas, plus all accessible areas within a 250-foot radius of the proposed investigation areas. Surveys will be conducted between 10:00 a.m. and 2 hours before sunset. • Burrowing owls will be avoided by relocating work areas. If an active burrow is identified near a work area and work cannot be conducted outside of the nesting season (February 1 to August 31), a qualified biologist will establish a no-activity buffer that extends a minimum of 656 feet around the burrow except in cases where the Project biologist has determined that case-specific circumstances warrant a smaller buffer. If burrowing owls are present at the site during the nonbreeding season (September 1 through January 31), a qualified biologist will establish a no-activity zone that extends a minimum of 150 feet around the burrow. • If the appropriate no-activity buffer for breeding or nonbreeding burrowing owls cannot be established, a wildlife biologist experienced in burrowing owl behavior will evaluate site-specific conditions and recommend a smaller buffer that still minimizes the potential to disturb the owls (and still allows reproductive success during the breeding season). The site-specific buffer will be established by taking into consideration 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 to existing conditions, and the dissimilarity of the proposed activity to background activities. • A biological monitor will be present during all activities occurring within any reduced buffers. If during the breeding season there is any change in owl nesting and foraging behavior as a result of activities, the biological monitor will work with personnel and Authority to provide additional protections to reduce disturbance, such as adding visual and sound curtains. • If monitoring indicates that the nest is abandoned prior to the end of nesting season and the burrow is no longer in used by owls, the no-activity buffer may be removed.	Prior to and during investigations	Throughout the investigation period, including the pre-investigation siting survey	Proposed Action contractor and staff, qualified biologist
MM Bio-13: Tricolored Blackbird	The following measures will be implemented to avoid, minimize, and mitigate impacts on tricolored blackbird during investigations: • Prior to initiation of investigations within 1,300 feet of suitable nesting habitat, a biologist with experience surveying for and observing tricolored blackbird will conduct pre-activity surveys to establish use of nesting habitat by tricolored blackbird colonies. Surveys will be conducted, where access allows, during the nesting season (generally March 15 to July 31). Three surveys will be conducted within 15 days prior to activities with one of the surveys within 5 days prior to the start of activities. If active tricolored blackbird nesting colonies are identified, the following avoidance measure will be implemented: • Investigations will fully avoid tricolored blackbird nesting and roosting habitat. • To the extent practicable, investigations will not occur within 1,300 feet of an active tricolored blackbird nesting colony (generally March 15 through July 31). Where a buffer distance of 1,300 feet is not practicable, CDFW will be consulted to develop a smaller buffer. The buffer may be reduced in areas with dense trees, buildings, or other habitat features between the activities and the active nest colony, or where there is sufficient topographic relief to protect the colony from excessive noise or visual disturbance as determined by the biological monitor that is experienced with tricolored blackbird. If tricolored blackbirds colonize habitat adjacent to work areas after activities have been initiated, the contractor will reduce disturbance through establishment of buffers and/or sound curtains, as determined by the biological monitor. • Investigations will avoid activities within at least 300 feet from occupied active tricolored blackbird roosting habitat. This minimum buffer may be reduced in areas with dense trees, buildings, or other habitat features between the work activities and the roost, or where there is sufficient topographic relief to protect the roosting site from excessive noise or visual disturbance, or where sound curtains are used, as determined by the biological monitor that is experienced with tricolored blackbird.	Prior to and during investigations	Throughout the investigation period, including the pre-investigation siting survey	Proposed Action contractor and staff, qualified biologist
MM Bio-14: Bank Swallow	The following measures will be implemented to avoid, minimize, and mitigate impacts on bank swallow during investigations: • Prior to beginning investigations within 500 feet of the Sacramento River during the bank swallow nesting season (April 1 through August 31), a pre-activity survey for bank swallow colonies will be conducted where bank swallow habitat is present within 500 feet of work areas. If no active nesting colonies are present, no further measures are required. • If an active colony is found and work must occur during the nesting season (April 1 through August 31), the Authority will establish a no disturbance buffer (determined by the Authority in consultation with CDFW) around the colony during the breeding season. In addition, a qualified biologist will monitor any active colony within 500 feet of work areas to ensure that activities do not affect nest success.	Prior to and during investigations	Throughout the investigation period, including the pre-investigation siting survey	Proposed Action contractor and staff, qualified biologist
MM Bio-15: American Badger	The following measures will be implemented to avoid, minimize, and mitigate impacts on American badger during investigations: • A qualified biologist will survey for American badger in work areas, concurrent with the pre-activity survey for burrowing owl. If an active den is located, no investigations will occur within 50 feet of an active American badger den. • A biological monitor will be present during all work within 50 to 100 feet of an active American badger den. The monitor will ensure that activities do not affect the den or substantially disrupt the badger's ability to move freely in and out its den.	Prior to and during investigations	Throughout the investigation period, including the pre-investigation siting survey	Proposed Action contractor and staff, qualified biologist
MM Bio-16: Special-Status Plant Species	The following measures will be implemented to avoid, minimize, and mitigate impacts on special-status plant species during investigations: • Pre-activity surveys will be conducted for special-status plant species in all investigation and equipment staging areas, as well as areas within 250 feet of investigation and equipment staging areas. The purpose of these surveys will be to verify that the locations of special-status plants identified in previous	Prior to and during investigations	Throughout the investigation period, including the pre-	Proposed Action contractor and staff, qualified biologist

	record searches or surveys are extant, identify any new special-status plant occurrences, and cover any portions of the Proposed Action Area not previously surveyed. During pre-activity surveys, the biologist would also identify any host plants suitable for special-status pollinators (e.g., milkweed, dusty maidens, lupines, medics, phacelias, sages, clarkias, poppies, and wild buckwheats). • All surveys will be conducted by qualified biologists using the using *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFW, 2018). To the extent feasible, surveys will be conducted during the blooming season, when special-status plant species would be most evident and identifiable. Locations of special- status plants in the Proposed Action Area will be recorded using a GPS unit and flagged. • Where surveys determine that a special-status plant species is present in or adjacent to a proposed investigation area, direct and indirect impacts of the Proposed Action on the species will be avoided through the establishment of 250-foot activity exclusion zones surrounding the periphery of occurrences, within which no ground-disturbing activities shall take place. Activity exclusion zones for special-status plant species will be established according to a 250-foot buffer surrounding the periphery of each special-status plant species occurrence, the boundaries of which will be clearly marked with standard orange plastic construction exclusion fencing or its equivalent. The establishment of activity exclusion zones will not be required if no activity-related disturbances will occur within 250 feet of the occurrence. The 250-foot buffer may be reduced based on the nature of the activities, the presence of a biological monitor, and/or other site-specific conditions that would allow work to occur closer.		investigation siting survey	
MM Bio-17: Special-Status Bat Species	The following measures will be implemented to avoid, minimize, and mitigate impacts on special-status bat species during investigations: • Pre-activity surveys will be conducted for special-status bat species in all work areas, including staging areas. The biologist shall look for bats and bat sign, including existing roost sites and bat guano deposits, and will listen for roosting bats. If potential roost sites are identified, a project-specific avoidance and minimization plan shall be prepared by a qualified biologist to be reviewed and approved by CDFW prior to the start of Proposed Action investigations. • If vegetation trimming is needed, the biologist will examine the trees to be trimmed to identify suitable bat roosting habitat. Trimming of trees with potentially suitable bat roosting habitat will be avoided during the maternity season (generally between April 1 and July 31) and the hibernation season (generally from November 1 to March 1). • If a maternity roost is found, the roost will be protected until July 31 or until the qualified biologist has determined the maternity roost is no longer active. Appropriate no-work buffers around the roost will be established under direction of the qualified biologist. Buffer distances may vary depending on the species and activities being conducted. The establishment of buffers will be coordinated with CDFW through the preparation of the previously referenced project-specific avoidance and minimization plan.	Throughout the investigation period	Throughout the investigation period, including the pre-investigation siting survey	Proposed Action contractor and staff, qualified biologist
MM Geo-1: Consult with Qualified Paleontologist if Paleontological Resources Were Discovered	The proposed investigations have the potential to have impacts on unidentified paleontological resources. If vertebrate or plant fossils are discovered during field activities, the Authority and Reclamation would be notified, and the fossil would be evaluated for its unique properties and protected by extraction, preservation, and curation by a qualified paleontologist.	Throughout the investigation period if paleontological resources are discovered	Throughout the investigation period	Proposed Action contractor and staff, qualified paleontologist
MM Cul-1: Avoid Impacts on Cultural Resources	Impacts on known historical resources/historic properties, including prehistoric and historic-era archaeological sites, buildings, structures, Traditional Cultural Properties, and human remains will be avoided to the extent feasible. Methods of avoidance during Proposed Action planning shall include relocation of geologic, geotechnical, and geophysical investigation locations to at least 50 feet away from any identified resource dependent upon the resource and the area, prioritizing the use of existing roadways or other previously disturbed locations for the investigations, rerouting of access routes and the installation of protective fencing around resources where appropriate.	Prior to investigations	Throughout the investigation period, including the one day pre-investigation siting survey for each investigation location	Proposed Action contractor and staff, cultural resource specialist, and tribal monitor
MM Cul-2: Pre-activity Pedestrian Survey	Once the geotechnical field investigation sites have been confirmed, built resource surveys and archaeological surveys will be conducted in all work areas to identify whether any new or previously unidentified built historic resources or archaeological sites are present. This activity will be conducted regardless of whether a previous cultural resources survey has covered the area to ensure adequate coverage. All newly identified resources will be recorded on California Department of Parks and Recreation 523-Series forms. If archaeological resources are identified during pre-activity survey, the Authority will ensure that they are avoided to the extent feasible by implementing the measures in MM Cul-1 (Avoid Impacts on Cultural Resources).	At least one week prior to investigations	One day coupled with the pre-investigation siting survey for each investigation location	Proposed Action contractor and staff, cultural resource specialist, and tribal monitor

MM Cul-3: Prepare a Post-review Discovery Plan	Prior to the start of geotechnical exploration, a Post-review Discovery Plan (Plan) will be prepared by a qualified archaeologist. Not all cultural resources are visible on the ground surface. Protocols for addressing the accidental discovery of archaeological resources or human remains that are not visible on the ground surface during Proposed Action implementation shall be outlined in the Plan. The Plan shall be developed prior to ground disturbance so that all parties are aware of the actions required if buried archaeological resources are encountered during Proposed Action implementation. At a minimum, the Plan shall include protocols and procedures for addressing post-review discoveries, Archaeological Sensitivity Training for Proposed Action personnel, an Archaeological Monitoring Plan, and a Burial Treatment Plan. The Plan will be consistent with 36 CFR 800.13(b)9(3). The post review discovery procedures included in the Plan will at a minimum include the process identified under MM Cul-6 below regarding work stoppage at the discovery site and appropriate assessment of the discovery. The Archaeological Sensitivity Training will cover the historical context, resource types (using representative photographs of soils, features or artifacts if appropriate) and legal status of known resources, regulatory protections, penalties for noncompliance, benefits of compliance, as well as the avoidance and minimization measures that the Proposed Action has implemented. The training will be conducted prior to the start of investigations. The Archaeological Monitoring Plan describes qualifications and protocols for monitoring Proposed Action-related ground disturbance, including the following: • Documentation and chain-of-command notifications • Procedures for securing an area where cultural remains are discovered • Procedures for evaluating the nature of the finds • The schedule for notifications and conducting activities associated with evaluating the finds. • Protocols for establishing minimum depth of borings when monitoring is no longer needed Specific activities to be monitored include subsurface geotechnical boring. Boring samples will be collected in clear plastic sleeves to allow for inspection of soils contained in the samples. The Burial Treatment Plan describes specific procedures for burial discovery, including documentation and chain-of-command notifications, and procedures for securing an area where burials are discovered.	Prior to investigations	Throughout the investigation period	Authority and Reclamation's cultural resource specialist
MM Cul-4: Conduct Archaeological Sensitivity Training	The Authority and Reclamation will be responsible for obtaining the services of a qualified archaeologist to conduct archaeological sensitivity training (see MM Cul-3). Prior to the start of the Proposed Action investigations, a qualified archaeologist who meets the Secretary of the Interior's Standards will conduct a mandatory archaeological sensitivity training (see MM Cul-3) for all personnel involved in the geotechnical and geological investigations about cultural resources sensitivity in the Proposed Action Area and cultural resources that could be encountered during the Proposed Action investigations. Participants will be required to sign a form that states they have received and understand the training. The Authority will maintain the record of training and make it available to the Proposed Action's cultural resources staff and to Bureau of Reclamation, upon request. The Authority-provided cultural monitor will ensure that the new personnel brought onto the Proposed Action team receive the mandatory training before starting work.	Prior to investigations	Throughout the investigation period	Proposed Action contractor and staff, cultural resource specialist, and tribal monitor
MM Cul-5: Conduct Archaeological Monitoring	The Authority and Reclamation will be responsible for obtaining the services of a qualified archaeologist to conduct archaeological monitoring (see MM Cul-3). One qualified archaeological monitor shall monitor ground-disturbing activities associated with the Proposed Action (i.e., subsurface geotechnical boring). Once boring activities reach depths exceeding that which is likely to encounter cultural remains as described and established in the Archaeological Monitoring Plan, monitoring is no longer necessary. One Native American monitor (as appropriate according to Proposed Action consultation with tribes) will also be invited to monitor these same Proposed Action ground disturbing activities. In accordance with Cul-6 (Immediately Halt Ground-disturbing Activities if Cultural Resources Are Discovered and Implement a Post-review Discovery Plan), if any important (potentially eligible) prehistoric or historic-era features, or any human remains, are exposed during investigations, the archaeological monitor shall have the authority to notify the appropriate contractor supervisor to stop work in the vicinity of the find and implement the Post-review Discovery Plan. If human remains are encountered, the archaeological monitor will also initiate Cul-7 (Immediately Halt Ground-disturbing Activities if Human Remains Are Discovered and Implement a Burial Treatment Plan). Resources identified during investigation activities will be treated in accordance with MM Cul-1 (Avoid Impacts on Cultural Resources).	Throughout the investigation period	Throughout the investigation period	Proposed Action contractor and staff, cultural resource specialist, and tribal monitor

MM Cul-6: Immediately Halt Ground-disturbing Activities if Cultural Resources Are Discovered and Implement the Post-review Discovery Plan Prepared under MM Cul-1	If important (potentially eligible) cultural resources, such as structural features, unusual amounts of bone or shell, flaked or ground stone artifacts, historic-era artifacts, human remains, or architectural remains are encountered during any Proposed Action activities, work shall be suspended in coordination with the appropriate contractor supervisor immediately at the location of the find and within an appropriate radius, with a minimum of 50 feet. The Authority will implement MM Cul-1 (Avoid Impacts on Cultural Resources), and implement the Post-review Discovery Plan prepared under MM Cul-3. As part of the Post-review Discovery Plan, a qualified archaeologist shall conduct a field investigation of the find and recommend avoidance measures deemed necessary for the protection of any cultural resource concluded by the archaeologist to represent an historical resource, unique archaeological resource, or a potential historic property. If necessary, the qualified archaeologist shall recommend additional measures in consultation with the Authority and responsible agencies and, as appropriate, interested parties such as Native American tribes. The Authority and Reclamation, in consultation with responsible agencies, will determine when/if ground-disturbing activities at the geotechnical location may resume. All the activities identified above will be detailed in the Post-review Discovery Plan so that all parties are aware of the actions required if buried archaeological sites are encountered during Proposed Action implementation. Discoveries of human remains shall be treated as described in the following sections for Cul-7 (Immediately Halt Ground-disturbing Activities if Human Remains Are Discovered and Implement a Burial Treatment Plan).	Throughout the investigation period if cultural resources are discovered	Throughout the investigation period	Proposed Action contractor and staff, cultural resource specialist, and tribal monitor
MM Cul-7: Immediately Halt Ground-disturbing Activities if Human Remains Are Discovered and Implement a Burial Treatment Plan	In accordance with relevant provisions of the California Health and Safety Code, if human remains are uncovered during ground-disturbing activities, the potentially damaging excavation must halt in the area of the remains and the local County Coroner must be notified. The coroner is required to examine all discoveries of human remains within 48 hours of receiving notice of a discovery on private or State lands (Health and Safety Code Section 7050.5(b)). If the Coroner determines that the remains are those of a Native American, he or she must contact the Native American Heritage Commission by phone within 24 hours of making that determination (Health and Safety Code Section 7050(c)). Pursuant to the provisions of Public Resources Code Section 5097.98, the Native American Heritage Commission will identify a Most Likely Descendant. The Most Likely Descendant designated by the Native American Heritage Commission will have at least 48 hours to inspect the site and propose treatment and disposition of the remains and any associated grave goods. All the activities identified above shall be detailed in a Burial Treatment Plan (MM Cul-3) developed in consultation with local Native American tribes prior to Proposed Action implementation. If human remains that are not of Native American origin are discovered, disposition of the remains shall be determined in consultation with the coroner or possible descendants, if they can be identified. In the event human remains are discovered on federal lands, the federal land managing agency should be notified immediately, and should the Coroner determine the find may be Native American, then the federal land managing agency must follow the procedures of the Native American Graves Protection and Repatriation Act.	Throughout the investigation period if human remains are discovered	Throughout the investigation period	Proposed Action contractor and staff, cultural resource specialist, and tribal monitor
MM TCR-1: Avoid or Preserve in Place	Avoidance and preservation of the resources in place, including, but not limited to, planning and implementing activities to avoid the resources and protect the cultural and natural context, or planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.	Throughout the investigation period	Throughout the investigation period	Proposed Action contractor and staff, cultural resource specialist, and tribal monitor
MM TCR-2: Treat Resource with Culturally Appropriate Dignity	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: • Protecting the cultural character and integrity of the resource. • Protecting the traditional use of the resource. • Protecting the confidentiality of the resource.	Throughout the investigation period	Throughout the investigation period	Proposed Action contractor and staff, cultural resource specialist, and tribal monitor
MM TCR-3: Permanent Conservation Easements	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.	Throughout the investigation period	Throughout the investigation period	Proposed Action contractor and staff, cultural resource specialist, and tribal monitor

Appendix C. Detailed CalEEMod Output

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Sites Test Pits, Fault Studies and Quarry Studies

Sacramento Valley Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	6.20	Acre	6.20	270,072.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.5	**Precipitation Freq (Days)**	65
Climate Zone	3			**Operational Year**	2024
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - total area of disturbance = 6.2 acres

Construction Phase - Investigations would occur between January 2023 and December 2024

Off-road Equipment - adjusted per project equipment list in Table 2

Grading - .

Trips and VMT - Worker round trips = 30, Representative worker trip length = 10

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	500.00
tblConstructionPhase	PhaseEndDate	2/24/2023	12/13/2024
tblConstructionPhase	PhaseStartDate	2/11/2023	1/16/2023

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblGrading	AcresOfGrading	375.00	6.20
tblOffRoadEquipment	HorsePower	402.00	350.00
tblOffRoadEquipment	LoadFactor	0.37	0.37
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	OffRoadEquipmentType		Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	WorkerTripLength	16.80	10.00
tblTripsAndVMT	WorkerTripNumber	38.00	30.00

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					
2023	1.1452	8.7915	8.0601	0.0281	1.1599	0.3365	1.4963	0.6283	0.3096	0.9379	0.0000	2,464.4639	2,464.4639	0.7907	6.5000e-004	2,484.4237

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2024	1.1300	8.3031	7.9895	0.0281	1.1599	0.3152	1.4750	0.6283	0.2899	0.9183	0.0000	2,464.6021	2,464.6021	0.7909	6.0000e-004	2,484.5534
Maximum	**1.1452**	**8.7915**	**8.0601**	**0.0281**	**1.1599**	**0.3365**	**1.4963**	**0.6283**	**0.3096**	**0.9379**	**0.0000**	**2,464.6021**	**2,464.6021**	**0.7909**	**6.5000e-004**	**2,484.5534**

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					
2023	1.1452	8.7914	8.0601	0.0281	1.1599	0.3365	1.4963	0.6283	0.3096	0.9379	0.0000	2,464.4610	2,464.4610	0.7907	6.5000e-004	2,484.4207
2024	1.1300	8.3031	7.9895	0.0281	1.1599	0.3152	1.4750	0.6283	0.2899	0.9183	0.0000	2,464.5992	2,464.5992	0.7909	6.0000e-004	2,484.5505
Maximum	**1.1452**	**8.7914**	**8.0601**	**0.0281**	**1.1599**	**0.3365**	**1.4963**	**0.6283**	**0.3096**	**0.9379**	**0.0000**	**2,464.5992**	**2,464.5992**	**0.7909**	**6.5000e-004**	**2,484.5505**

	ROG	NOx	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**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-16-2023	4-15-2023	2.5555	2.5555
2	4-16-2023	7-15-2023	2.5839	2.5839
3	7-16-2023	10-15-2023	2.6123	2.6123
4	10-16-2023	1-15-2024	2.5907	2.5907
5	1-16-2024	4-15-2024	2.4529	2.4529
6	4-16-2024	7-15-2024	2.4529	2.4529

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

7	**7-16-2024**	**9-30-2024**	2.0756	2.0756
		Highest	2.6123	2.6123

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	0.0212	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.1000e-004	1.1000e-004	0.0000	0.0000	1.2000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0212**	**0.0000**	**6.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.1000e-004**	**1.1000e-004**	**0.0000**	**0.0000**	**1.2000e-004**

Mitigated Operational

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

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Area	0.0212	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.1000e-004	1.1000e-004	0.0000	0.0000	1.2000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0212**	**0.0000**	**6.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.1000e-004**	**1.1000e-004**	**0.0000**	**0.0000**	**1.2000e-004**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/16/2023	12/13/2024	5	500	

Acres of Grading (Site Preparation Phase): 6.2

Acres of Grading (Grading Phase): 0

Acres of Paving: 6.2

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating –

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Skid Steer Loaders	2	12.00	65	0.37

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Site Preparation	Off-Highway Trucks	2	12.00	350	0.38
Site Preparation	Off-Highway Trucks	4	12.00	402	0.38
Site Preparation	Off-Highway Trucks	4	12.00	402	0.38
Site Preparation	Rubber Tired Dozers	1	12.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	2	12.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	15	30.00	0.00	0.00	10.00	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.1324	0.0000	1.1324	0.6210	0.0000	0.6210	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.1344	8.7845	7.9730	0.0278		0.3364	0.3364		0.3094	0.3094	0.0000	2,442.5284	2,442.5284	0.7900	0.0000	2,462.2775
Total	**1.1344**	**8.7845**	**7.9730**	**0.0278**	**1.1324**	**0.3364**	**1.4688**	**0.6210**	**0.3094**	**0.9305**	**0.0000**	**2,442.5284**	**2,442.5284**	**0.7900**	**0.0000**	**2,462.2775**

Unmitigated Construction Off-Site

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Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0108	6.9700e-003	0.0871	2.4000e-004	0.0274	1.5000e-004	0.0276	7.3000e-003	1.4000e-004	7.4300e-003	0.0000	21.9355	21.9355	7.2000e-004	6.5000e-004	22.1462
Total	**0.0108**	**6.9700e-003**	**0.0871**	**2.4000e-004**	**0.0274**	**1.5000e-004**	**0.0276**	**7.3000e-003**	**1.4000e-004**	**7.4300e-003**	**0.0000**	**21.9355**	**21.9355**	**7.2000e-004**	**6.5000e-004**	**22.1462**

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					1.1324	0.0000	1.1324	0.6210	0.0000	0.6210	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.1344	8.7845	7.9730	0.0278		0.3363	0.3363		0.3094	0.3094	0.0000	2,442.5255	2,442.5255	0.7900	0.0000	2,462.2746
Total	**1.1344**	**8.7845**	**7.9730**	**0.0278**	**1.1324**	**0.3363**	**1.4688**	**0.6210**	**0.3094**	**0.9305**	**0.0000**	**2,442.5255**	**2,442.5255**	**0.7900**	**0.0000**	**2,462.2746**

Mitigated Construction Off-Site

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0108	6.9700e-003	0.0871	2.4000e-004	0.0274	1.5000e-004	0.0276	7.3000e-003	1.4000e-004	7.4300e-003	0.0000	21.9355	21.9355	7.2000e-004	6.5000e-004	22.1462
Total	**0.0108**	**6.9700e-003**	**0.0871**	**2.4000e-004**	**0.0274**	**1.5000e-004**	**0.0276**	**7.3000e-003**	**1.4000e-004**	**7.4300e-003**	**0.0000**	**21.9355**	**21.9355**	**7.2000e-004**	**6.5000e-004**	**22.1462**

3.2 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					1.1324	0.0000	1.1324	0.6210	0.0000	0.6210	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.1199	8.2969	7.9087	0.0278		0.3150	0.3150		0.2898	0.2898	0.0000	2,443.3865	2,443.3865	0.7902	0.0000	2,463.1425
Total	**1.1199**	**8.2969**	**7.9087**	**0.0278**	**1.1324**	**0.3150**	**1.4474**	**0.6210**	**0.2898**	**0.9108**	**0.0000**	**2,443.3865**	**2,443.3865**	**0.7902**	**0.0000**	**2,463.1425**

Unmitigated Construction Off-Site

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Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0101	6.1900e-003	0.0808	2.3000e-004	0.0274	1.4000e-004	0.0276	7.3000e-003	1.3000e-004	7.4200e-003	0.0000	21.2156	21.2156	6.5000e-004	6.0000e-004	21.4109
Total	**0.0101**	**6.1900e-003**	**0.0808**	**2.3000e-004**	**0.0274**	**1.4000e-004**	**0.0276**	**7.3000e-003**	**1.3000e-004**	**7.4200e-003**	**0.0000**	**21.2156**	**21.2156**	**6.5000e-004**	**6.0000e-004**	**21.4109**

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					1.1324	0.0000	1.1324	0.6210	0.0000	0.6210	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.1199	8.2969	7.9087	0.0278		0.3150	0.3150		0.2898	0.2898	0.0000	2,443.3835	2,443.3835	0.7902	0.0000	2,463.1395
Total	**1.1199**	**8.2969**	**7.9087**	**0.0278**	**1.1324**	**0.3150**	**1.4474**	**0.6210**	**0.2898**	**0.9108**	**0.0000**	**2,443.3835**	**2,443.3835**	**0.7902**	**0.0000**	**2,463.1395**

Mitigated Construction Off-Site

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0101	6.1900e-003	0.0808	2.3000e-004	0.0274	1.4000e-004	0.0276	7.3000e-003	1.3000e-004	7.4200e-003	0.0000	21.2156	21.2156	6.5000e-004	6.0000e-004	21.4109
Total	**0.0101**	**6.1900e-003**	**0.0808**	**2.3000e-004**	**0.0274**	**1.4000e-004**	**0.0276**	**7.3000e-003**	**1.3000e-004**	**7.4200e-003**	**0.0000**	**21.2156**	**21.2156**	**6.5000e-004**	**6.0000e-004**	**21.4109**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.516022	0.055984	0.185115	0.140509	0.032838	0.007379	0.013399	0.013498	0.000737	0.000476	0.028833	0.001070	0.004141

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

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

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Asphalt Surfaces	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					
Other Asphalt Surfaces	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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	0.0212	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.1000e-004	1.1000e-004	0.0000	0.0000	1.2000e-004
Unmitigated	0.0212	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.1000e-004	1.1000e-004	0.0000	0.0000	1.2000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.7600e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0175					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.1000e-004	1.1000e-004	0.0000	0.0000	1.2000e-004
Total	**0.0212**	**0.0000**	**6.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.1000e-004**	**1.1000e-004**	**0.0000**	**0.0000**	**1.2000e-004**

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	3.7600e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0175					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.1000e-004	1.1000e-004	0.0000	0.0000	1.2000e-004
Total	**0.0212**	**0.0000**	**6.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.1000e-004**	**1.1000e-004**	**0.0000**	**0.0000**	**1.2000e-004**

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

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Asphalt Surfaces	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			
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Asphalt Surfaces	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

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Sites Test Pits, Fault Studies and Quarry Studies

Sacramento Valley Air Basin, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	6.20	Acre	6.20	270,072.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.5	**Precipitation Freq (Days)**	65
Climate Zone	3			**Operational Year**	2024
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - total area of disturbance = 6.2 acres

Construction Phase - Investigations would occur between January 2023 and December 2024

Off-road Equipment - adjusted per project equipment list in Table 2

Grading - .

Trips and VMT - Worker round trips = 30, Representative worker trip length = 10

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	500.00
tblConstructionPhase	PhaseEndDate	2/24/2023	12/13/2024
tblConstructionPhase	PhaseStartDate	2/11/2023	1/16/2023

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblGrading	AcresOfGrading	375.00	6.20
tblOffRoadEquipment	HorsePower	402.00	350.00
tblOffRoadEquipment	LoadFactor	0.37	0.37
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	OffRoadEquipmentType		Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	WorkerTripLength	16.80	10.00
tblTripsAndVMT	WorkerTripNumber	38.00	30.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2023	9.1771	70.3267	64.5969	0.2246	9.2745	2.6919	11.9664	5.0273	2.4766	7.5039	0.0000	21,751.4488	21,751.4488	6.9723	5.3700e-003	21,927.3558

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2024	9.0544	66.4203	64.0215	0.2246	9.2745	2.5212	11.7957	5.0273	2.3195	7.3468	0.0000	21,752.0049	21,752.0049	6.9741	4.9900e-003	21,927.8451
Maximum	**9.1771**	**70.3267**	**64.5969**	**0.2246**	**9.2745**	**2.6919**	**11.9664**	**5.0273**	**2.4766**	**7.5039**	**0.0000**	**21,752.0049**	**21,752.0049**	**6.9741**	**5.3700e-003**	**21,927.8451**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2023	9.1771	70.3267	64.5969	0.2246	9.2745	2.6919	11.9664	5.0273	2.4766	7.5039	0.0000	21,751.4488	21,751.4488	6.9723	5.3700e-003	21,927.3558
2024	9.0544	66.4203	64.0215	0.2246	9.2745	2.5212	11.7957	5.0273	2.3195	7.3468	0.0000	21,752.0049	21,752.0049	6.9741	4.9900e-003	21,927.8451
Maximum	**9.1771**	**70.3267**	**64.5969**	**0.2246**	**9.2745**	**2.6919**	**11.9664**	**5.0273**	**2.4766**	**7.5039**	**0.0000**	**21,752.0049**	**21,752.0049**	**6.9741**	**5.3700e-003**	**21,927.8451**

	ROG	NOx	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**

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

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Category	lb/day										lb/day					
Area	0.1163	1.0000e-005	6.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.3600e-003	1.3600e-003	0.0000		1.4500e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1163**	**1.0000e-005**	**6.3000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**1.3600e-003**	**1.3600e-003**	**0.0000**	**0.0000**	**1.4500e-003**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.1163	1.0000e-005	6.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.3600e-003	1.3600e-003	0.0000		1.4500e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1163**	**1.0000e-005**	**6.3000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**1.3600e-003**	**1.3600e-003**	**0.0000**	**0.0000**	**1.4500e-003**

	ROG	NOx	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

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/16/2023	12/13/2024	5	500	

Acres of Grading (Site Preparation Phase): 6.2

Acres of Grading (Grading Phase): 0

Acres of Paving: 6.2

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating –

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Skid Steer Loaders	2	12.00	65	0.37
Site Preparation	Off-Highway Trucks	2	12.00	350	0.38
Site Preparation	Off-Highway Trucks	4	12.00	402	0.38
Site Preparation	Off-Highway Trucks	4	12.00	402	0.38
Site Preparation	Rubber Tired Dozers	1	12.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	2	12.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	15	30.00	0.00	0.00	10.00	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2023

Unmitigated Construction On-Site

Date: 8/5/2022 8:41 AM

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.0463	0.0000	9.0463	4.9668	0.0000	4.9668			0.0000			0.0000
Off-Road	9.0749	70.2759	63.7843	0.2225		2.6908	2.6908		2.4755	2.4755		21,539.4135	21,539.4135	6.9663		21,713.5706
Total	**9.0749**	**70.2759**	**63.7843**	**0.2225**	**9.0463**	**2.6908**	**11.7370**	**4.9668**	**2.4755**	**7.4423**		**21,539.4135**	**21,539.4135**	**6.9663**		**21,713.5706**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1023	0.0508	0.8125	2.1000e-003	0.2282	1.1800e-003	0.2294	0.0605	1.0900e-003	0.0616		212.0353	212.0353	5.9800e-003	5.3700e-003	213.7852
Total	**0.1023**	**0.0508**	**0.8125**	**2.1000e-003**	**0.2282**	**1.1800e-003**	**0.2294**	**0.0605**	**1.0900e-003**	**0.0616**		**212.0353**	**212.0353**	**5.9800e-003**	**5.3700e-003**	**213.7852**

Mitigated Construction On-Site

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.0463	0.0000	9.0463	4.9668	0.0000	4.9668			0.0000			0.0000
Off-Road	9.0749	70.2759	63.7843	0.2225		2.6908	2.6908		2.4755	2.4755	0.0000	21,539.4135	21,539.4135	6.9663		21,713.5706
Total	**9.0749**	**70.2759**	**63.7843**	**0.2225**	**9.0463**	**2.6908**	**11.7370**	**4.9668**	**2.4755**	**7.4423**	**0.0000**	**21,539.4135**	**21,539.4135**	**6.9663**		**21,713.5706**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1023	0.0508	0.8125	2.1000e-003	0.2282	1.1800e-003	0.2294	0.0605	1.0900e-003	0.0616		212.0353	212.0353	5.9800e-003	5.3700e-003	213.7852
Total	**0.1023**	**0.0508**	**0.8125**	**2.1000e-003**	**0.2282**	**1.1800e-003**	**0.2294**	**0.0605**	**1.0900e-003**	**0.0616**		**212.0353**	**212.0353**	**5.9800e-003**	**5.3700e-003**	**213.7852**

3.2 Site Preparation - 2024

Unmitigated Construction On-Site

Date: 8/5/2022 8:41 AM

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.0463	0.0000	9.0463	4.9668	0.0000	4.9668			0.0000			0.0000
Off-Road	8.9594	66.3752	63.2696	0.2226		2.5201	2.5201		2.3185	2.3185		21,546.9802	21,546.9802	6.9687		21,721.1984
Total	**8.9594**	**66.3752**	**63.2696**	**0.2226**	**9.0463**	**2.5201**	**11.5663**	**4.9668**	**2.3185**	**7.2852**		**21,546.9802**	**21,546.9802**	**6.9687**		**21,721.1984**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0951	0.0452	0.7518	2.0300e-003	0.2282	1.1200e-003	0.2293	0.0605	1.0300e-003	0.0616		205.0247	205.0247	5.3900e-003	4.9900e-003	206.6467
Total	**0.0951**	**0.0452**	**0.7518**	**2.0300e-003**	**0.2282**	**1.1200e-003**	**0.2293**	**0.0605**	**1.0300e-003**	**0.0616**		**205.0247**	**205.0247**	**5.3900e-003**	**4.9900e-003**	**206.6467**

Mitigated Construction On-Site

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.0463	0.0000	9.0463	4.9668	0.0000	4.9668			0.0000			0.0000
Off-Road	8.9594	66.3752	63.2696	0.2226		2.5201	2.5201		2.3185	2.3185	0.0000	21,546.9801	21,546.9801	6.9687		21,721.1984
Total	**8.9594**	**66.3752**	**63.2696**	**0.2226**	**9.0463**	**2.5201**	**11.5663**	**4.9668**	**2.3185**	**7.2852**	**0.0000**	**21,546.9801**	**21,546.9801**	**6.9687**		**21,721.1984**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0951	0.0452	0.7518	2.0300e-003	0.2282	1.1200e-003	0.2293	0.0605	1.0300e-003	0.0616		205.0247	205.0247	5.3900e-003	4.9900e-003	206.6467
Total	**0.0951**	**0.0452**	**0.7518**	**2.0300e-003**	**0.2282**	**1.1200e-003**	**0.2293**	**0.0605**	**1.0300e-003**	**0.0616**		**205.0247**	**205.0247**	**5.3900e-003**	**4.9900e-003**	**206.6467**

4.0 Operational Detail - Mobile

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.516022	0.055984	0.185115	0.140509	0.032838	0.007379	0.013399	0.013498	0.000737	0.000476	0.028833	0.001070	0.004141

5.0 Energy Detail

Historical Energy Use: N

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.1163	1.0000e-005	6.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.3600e-003	1.3600e-003	0.0000		1.4500e-003
Unmitigated	0.1163	1.0000e-005	6.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.3600e-003	1.3600e-003	0.0000		1.4500e-003

6.2 Area by SubCategory

Unmitigated

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0206					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0957					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	6.0000e-005	1.0000e-005	6.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.3600e-003	1.3600e-003	0.0000		1.4500e-003
Total	**0.1163**	**1.0000e-005**	**6.3000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**1.3600e-003**	**1.3600e-003**	**0.0000**		**1.4500e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0206					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0957					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	6.0000e-005	1.0000e-005	6.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.3600e-003	1.3600e-003	0.0000		1.4500e-003
Total	**0.1163**	**1.0000e-005**	**6.3000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**1.3600e-003**	**1.3600e-003**	**0.0000**		**1.4500e-003**

7.0 Water Detail

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Sites Test Pits, Fault Studies and Quarry Studies

Sacramento Valley Air Basin, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	6.20	Acre	6.20	270,072.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.5	**Precipitation Freq (Days)**	65
Climate Zone	3			**Operational Year**	2024
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - total area of disturbance = 6.2 acres

Construction Phase - Investigations would occur between January 2023 and December 2024

Off-road Equipment - adjusted per project equipment list in Table 2

Grading - .

Trips and VMT - Worker round trips = 30, Representative worker trip length = 10

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	500.00
tblConstructionPhase	PhaseEndDate	2/24/2023	12/13/2024
tblConstructionPhase	PhaseStartDate	2/11/2023	1/16/2023

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblGrading	AcresOfGrading	375.00	6.20
tblOffRoadEquipment	HorsePower	402.00	350.00
tblOffRoadEquipment	LoadFactor	0.37	0.37
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	OffRoadEquipmentType		Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	WorkerTripLength	16.80	10.00
tblTripsAndVMT	WorkerTripNumber	38.00	30.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2023	9.1645	70.3384	64.4935	0.2244	9.2745	2.6919	11.9664	5.0273	2.4766	7.5039	0.0000	21,727.9104	21,727.9104	6.9732	6.1600e-003	21,904.0770

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2024	9.0429	66.4306	63.9290	0.2244	9.2745	2.5212	11.7957	5.0273	2.3195	7.3468	0.0000	21,729.3034	21,729.3034	6.9750	5.7200e-003	21,905.3840
Maximum	**9.1645**	**70.3384**	**64.4935**	**0.2244**	**9.2745**	**2.6919**	**11.9664**	**5.0273**	**2.4766**	**7.5039**	**0.0000**	**21,729.3034**	**21,729.3034**	**6.9750**	**6.1600e-003**	**21,905.3840**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2023	9.1645	70.3384	64.4935	0.2244	9.2745	2.6919	11.9664	5.0273	2.4766	7.5039	0.0000	21,727.9104	21,727.9104	6.9732	6.1600e-003	21,904.0770
2024	9.0429	66.4306	63.9290	0.2244	9.2745	2.5212	11.7957	5.0273	2.3195	7.3468	0.0000	21,729.3034	21,729.3034	6.9750	5.7200e-003	21,905.3840
Maximum	**9.1645**	**70.3384**	**64.4935**	**0.2244**	**9.2745**	**2.6919**	**11.9664**	**5.0273**	**2.4766**	**7.5039**	**0.0000**	**21,729.3034**	**21,729.3034**	**6.9750**	**6.1600e-003**	**21,905.3840**

	ROG	NOx	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**

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

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Category	lb/day										lb/day					
Area	0.1163	1.0000e-005	6.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.3600e-003	1.3600e-003	0.0000		1.4500e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1163**	**1.0000e-005**	**6.3000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**1.3600e-003**	**1.3600e-003**	**0.0000**	**0.0000**	**1.4500e-003**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.1163	1.0000e-005	6.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.3600e-003	1.3600e-003	0.0000		1.4500e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1163**	**1.0000e-005**	**6.3000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**1.3600e-003**	**1.3600e-003**	**0.0000**	**0.0000**	**1.4500e-003**

	ROG	NOx	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

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/16/2023	12/13/2024	5	500	

Acres of Grading (Site Preparation Phase): 6.2

Acres of Grading (Grading Phase): 0

Acres of Paving: 6.2

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating –

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Skid Steer Loaders	2	12.00	65	0.37
Site Preparation	Off-Highway Trucks	2	12.00	350	0.38
Site Preparation	Off-Highway Trucks	4	12.00	402	0.38
Site Preparation	Off-Highway Trucks	4	12.00	402	0.38
Site Preparation	Rubber Tired Dozers	1	12.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	2	12.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	15	30.00	0.00	0.00	10.00	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2023

Unmitigated Construction On-Site

Date: 8/5/2022 8:44 AM

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.0463	0.0000	9.0463	4.9668	0.0000	4.9668			0.0000			0.0000
Off-Road	9.0749	70.2759	63.7843	0.2225		2.6908	2.6908		2.4755	2.4755		21,539.4135	21,539.4135	6.9663		21,713.5706
Total	**9.0749**	**70.2759**	**63.7843**	**0.2225**	**9.0463**	**2.6908**	**11.7370**	**4.9668**	**2.4755**	**7.4423**		**21,539.4135**	**21,539.4135**	**6.9663**		**21,713.5706**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0897	0.0625	0.7092	1.8600e-003	0.2282	1.1800e-003	0.2294	0.0605	1.0900e-003	0.0616		188.4969	188.4969	6.9000e-003	6.1600e-003	190.5064
Total	**0.0897**	**0.0625**	**0.7092**	**1.8600e-003**	**0.2282**	**1.1800e-003**	**0.2294**	**0.0605**	**1.0900e-003**	**0.0616**		**188.4969**	**188.4969**	**6.9000e-003**	**6.1600e-003**	**190.5064**

Mitigated Construction On-Site

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.0463	0.0000	9.0463	4.9668	0.0000	4.9668			0.0000			0.0000
Off-Road	9.0749	70.2759	63.7843	0.2225		2.6908	2.6908		2.4755	2.4755	0.0000	21,539.4135	21,539.4135	6.9663		21,713.5706
Total	**9.0749**	**70.2759**	**63.7843**	**0.2225**	**9.0463**	**2.6908**	**11.7370**	**4.9668**	**2.4755**	**7.4423**	**0.0000**	**21,539.4135**	**21,539.4135**	**6.9663**		**21,713.5706**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0897	0.0625	0.7092	1.8600e-003	0.2282	1.1800e-003	0.2294	0.0605	1.0900e-003	0.0616		188.4969	188.4969	6.9000e-003	6.1600e-003	190.5064
Total	**0.0897**	**0.0625**	**0.7092**	**1.8600e-003**	**0.2282**	**1.1800e-003**	**0.2294**	**0.0605**	**1.0900e-003**	**0.0616**		**188.4969**	**188.4969**	**6.9000e-003**	**6.1600e-003**	**190.5064**

3.2 Site Preparation - 2024

Unmitigated Construction On-Site

Date: 8/5/2022 8:44 AM

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.0463	0.0000	9.0463	4.9668	0.0000	4.9668			0.0000			0.0000
Off-Road	8.9594	66.3752	63.2696	0.2226		2.5201	2.5201		2.3185	2.3185		21,546.9802	21,546.9802	6.9687		21,721.1984
Total	**8.9594**	**66.3752**	**63.2696**	**0.2226**	**9.0463**	**2.5201**	**11.5663**	**4.9668**	**2.3185**	**7.2852**		**21,546.9802**	**21,546.9802**	**6.9687**		**21,721.1984**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0836	0.0555	0.6593	1.8000e-003	0.2282	1.1200e-003	0.2293	0.0605	1.0300e-003	0.0616		182.3232	182.3232	6.2500e-003	5.7200e-003	184.1856
Total	**0.0836**	**0.0555**	**0.6593**	**1.8000e-003**	**0.2282**	**1.1200e-003**	**0.2293**	**0.0605**	**1.0300e-003**	**0.0616**		**182.3232**	**182.3232**	**6.2500e-003**	**5.7200e-003**	**184.1856**

Mitigated Construction On-Site

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.0463	0.0000	9.0463	4.9668	0.0000	4.9668			0.0000			0.0000
Off-Road	8.9594	66.3752	63.2696	0.2226		2.5201	2.5201		2.3185	2.3185	0.0000	21,546.9801	21,546.9801	6.9687		21,721.1984
Total	**8.9594**	**66.3752**	**63.2696**	**0.2226**	**9.0463**	**2.5201**	**11.5663**	**4.9668**	**2.3185**	**7.2852**	**0.0000**	**21,546.9801**	**21,546.9801**	**6.9687**		**21,721.1984**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0836	0.0555	0.6593	1.8000e-003	0.2282	1.1200e-003	0.2293	0.0605	1.0300e-003	0.0616		182.3232	182.3232	6.2500e-003	5.7200e-003	184.1856
Total	**0.0836**	**0.0555**	**0.6593**	**1.8000e-003**	**0.2282**	**1.1200e-003**	**0.2293**	**0.0605**	**1.0300e-003**	**0.0616**		**182.3232**	**182.3232**	**6.2500e-003**	**5.7200e-003**	**184.1856**

4.0 Operational Detail - Mobile

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.516022	0.055984	0.185115	0.140509	0.032838	0.007379	0.013399	0.013498	0.000737	0.000476	0.028833	0.001070	0.004141

5.0 Energy Detail

Historical Energy Use: N

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.1163	1.0000e-005	6.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.3600e-003	1.3600e-003	0.0000		1.4500e-003
Unmitigated	0.1163	1.0000e-005	6.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.3600e-003	1.3600e-003	0.0000		1.4500e-003

6.2 Area by SubCategory

Unmitigated

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0206					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0957					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	6.0000e-005	1.0000e-005	6.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.3600e-003	1.3600e-003	0.0000		1.4500e-003
Total	**0.1163**	**1.0000e-005**	**6.3000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**1.3600e-003**	**1.3600e-003**	**0.0000**		**1.4500e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0206					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0957					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	6.0000e-005	1.0000e-005	6.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.3600e-003	1.3600e-003	0.0000		1.4500e-003
Total	**0.1163**	**1.0000e-005**	**6.3000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**1.3600e-003**	**1.3600e-003**	**0.0000**		**1.4500e-003**

7.0 Water Detail

Sites Test Pits, Fault Studies and Quarry Studies - Sacramento Valley Air Basin, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation