



— BUREAU OF —  
RECLAMATION



# California Aqueduct - San Luis Canal Geotechnical Investigations Project

**CGB-EA-2021-038**

**Draft Environmental Assessment/Initial Study and Mitigated  
Negative Declaration**

## **Mission Statements**

The Department of the Interior (DOI) conserves and manages the Nation's natural resources and cultural heritage for the benefit and enjoyment of the American people, provides scientific and other information about natural resources and natural hazards to address societal challenges and create opportunities for the American people, and honors the Nation's trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities to help them prosper.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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# 1 Introduction

This Environmental Assessment (EA)/Initial Study (IS) and Mitigated Negative Declaration (MND) was jointly prepared by the U.S. Department of Interior, Bureau of Reclamation (Reclamation) as the lead federal agency and the California Department of Water Resources (DWR) as the lead state agency to satisfy the requirements of both the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). Reclamation and DWR are proposing to jointly implement the San Luis Canal (SLC) Geotechnical Investigations Project (hereinafter referred to as Proposed Action/Project), and have prepared this EA/IS pursuant to NEPA and CEQA to assess the potential effects of the Project. The Proposed Action is limited to conducting geotechnical investigations to collect soil samples to characterize and define the foundational requirements and potential borrow materials for raising the embankment, concrete liner, and bridges associated with Pools 17, 18, 20 and 21 of the SLC, a segment of the California Aqueduct (Aqueduct) that is jointly used by Reclamation and DWR. Throughout this document, Proposed Action and Proposed Project are used interchangeably and both terms reflect the Project as described below.

## 1.1 Background

Established in 1960 under Public Law 86-488, the SLC is a federal and State joint-use facility as part of the San Luis Unit (SLU) of the federal Central Valley Project (CVP). Reclamation was authorized to construct, operate, and maintain the SLU. The law also authorized Reclamation to enter in an agreement with the State of California for the construction and operation of the SLU, completed in the 1961 as the *Agreement between the United States of America and the Department of Water Resources of the State of California for the Construction and Operation of the Joint Use Facilities of the San Luis Unit*. The SLC was designed and constructed by Reclamation between 1963 and 1968, and is operated and maintained by DWR. As a joint-use facility, the SLC conveys water supplies for the CVP and the California State Water Project (SWP). In 1986, the *Agreement Between the United States of America and the State of California for Coordinated Operation of the Central Valley Project and the State Water Project* was executed to coordinate water deliveries. The SLC portion of the Aqueduct system is 102 miles in length, delivers CVP water supplies within the joint-use area, and transports water from the San Luis Reservoir to a point near Kettleman City where SWP water supplies continue for subsequent delivery in areas to the south and east. The principal purpose of the SLC is to deliver CVP irrigation water for approximately one million acres of prime farmland in California's San Joaquin Valley (Valley).

The SLC traverses portions of the Valley that have experienced subsidence<sup>1</sup>. Land subsidence in the Valley was first noted near the Delano area in 1935. Since that time, the Valley has undergone several periods of regional aquifer compaction as a result of groundwater extraction, largely for

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<sup>1</sup> Local or regional drop in ground surface elevation

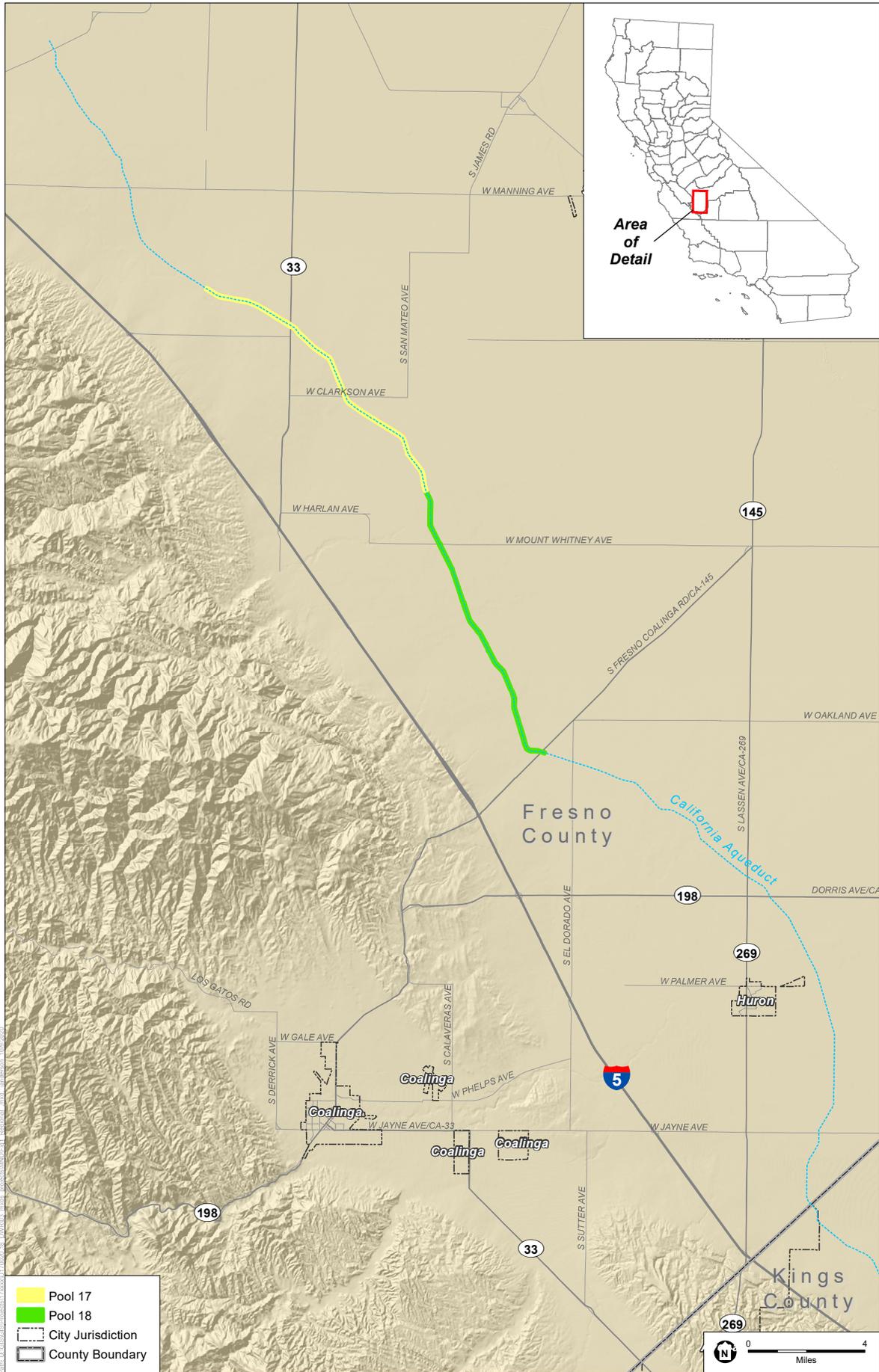
agricultural uses. The resulting land subsidence has reduced the freeboard<sup>2</sup> and capacity of the Aqueduct system to transport floodwater and deliver irrigation water. The Aqueduct freeboard is used as a reservoir, storing water during low-cost high-pumping periods and drafting water for downstream delivery during high-cost low-pumping periods. The decrease in lined freeboard has decreased or eliminated the potential to store additional water in some Aqueduct pools. The reduced storage forces more pumping during expensive periods to meet direct downstream demand.

In June 2017, DWR prepared the California Aqueduct Subsidence Study, which summarized the magnitude, location, and effects of historic and current subsidence on the Aqueduct system. The study identified three significant subsidence “bowls” occurring within the SLC segment of the Aqueduct. The Aqueduct is divided into segments or “Pools” for operational purposes. The largest bowl, Panoche, is located in Pools 15 through 18; the second subsidence bowl, Los Gatos, is located in Pools 19 through 21; and Kern, the third bowl, is in Pools 23 through 25. The study determined that in order to maintain delivery capacity, portions of the Aqueduct that have experienced subsidence require retrofitting to extend the concrete liner within the Aqueduct prism to restore storage and conveyance capacity.

In coordination with Reclamation, DWR is proposing to perform geotechnical investigations along the SLC embankments of Pools 17, 18, 20 and 21, within adjacent borrow sites, near abandoned utility pipelines and specified bridges. The proposed geotechnical investigations would inform the design of SLC Embankment and Liner Raise Project, which would address subsidence by restoring the capacity of Pools 17, 18, 20 and 21 from Milepost (MP) 122 to MP 143 and MP 155 to MP 172 of the SLC portion of the Aqueduct in Fresno and Kings Counties (**Figure 1, Appendix A**).

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<sup>2</sup> Vertical distance between the design water surface and the top of the concrete canal lining



SOURCE: DWR, 2020; ESA, 2020.

California Aqueduct Embankment and Liner Raise Project

**Figure 1**  
Regional Location



## 1.2 Purpose and Need for the Proposed Action

The primary purpose of the Proposed Action/Project is to provide geologic information needed to inform engineering, design plans, and environmental review for: elevating the embankment, concrete liner and bridges along the SLC at Pools 17, 18, 20 and 21; and replacing check structures, irrigation, and utility crossings. The Proposed Project would:

- Characterize and evaluate the existing soil and subsurface conditions beneath the embankment, bridges, irrigation, and utility crossings.
- Evaluate the existing engineered embankment and liner foundation to determine appropriate excavation depths and the requirements for subsidence control measures.
- Evaluate soil composition and chemistry of the potential borrow sites<sup>3</sup> that would provide materials to raise the embankment.
- Evaluate soil for potential contaminants adjacent to abandoned under crossing pipelines.

## 2 Alternatives Including Proposed Action

This EA/IS-MND considers two possible actions: the No Action Alternative and the Proposed Action. The No Action Alternative reflects future conditions without the Proposed Action and serves as a basis of comparison for determining potential effects to the human environment.

### 2.1 No Action Alternative

Under the No Action Alternative, Reclamation and DWR would not conduct geotechnical investigations, and therefore, would not provide information to inform engineering and design plans for retrofitting Pools 17, 18, 20 and 21 of the SLC. Without the information provided by the geotechnical exploration the subsequent embankment raise project would not proceed or would proceed in an uninformed way that could increase the risk of embankment issues or failures by constructing facilities in a non-engineered manner.

### 2.2 Proposed Action

Under the Proposed Action, Reclamation would issue land use authorizations to DWR or its representative(s) for conducting geotechnical testing within Reclamation right-of-way. DWR or its representative(s) would conduct up to 520 geotechnical investigations (476 are currently planned with a max of 520), to characterize the foundational requirements and soil chemical properties within and adjacent to Pools 17, 18, 20 and 21 of the SLC. Most investigations would occur within

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<sup>3</sup> A borrow site is an excavated area where material has been dug for use as fill material at another location.

the existing DWR/Reclamation right-of-way. A total of 10 geotechnical investigation locations may be located outside of DWR/Reclamation right-of-way and easements.

Investigation methods would be conducted using Cone Penetrometer Testing (CPT), Hollow Stem Auger (HSA), and Hand Auger (HA) drilling methods. HSA and CPT drilling would be completed by drilling contractors, while the HA drilling would be completed by engineering geologists using stainless-steel hand augers. CPTs would involve using a truck-mounted rig to push soil probes into 2.5-inch diameter hand-augured 3-foot-deep holes. HSA methods include rotating the HSA in previously hand augured 3-foot-deep holes to extract soil cuttings for logging and sampling purposes. All soil cuttings generated by HA or HSA drilling methods would be disposed of at either local landfills or spread on site. Soil cuttings that contain drilling fluid will not be spread on site. Soil cuttings are not generated using CPT drilling methods. Sample location adjustments may be made to avoid potential to impacts cultural and biological resources, and in response to observations made in the field during implementation. All geotechnical investigation samples would not be adjusted beyond the Project footprint identified in **Figures 1 through 12 in Appendix A**. Total depths of all geotechnical investigation samples may be adjusted by the engineering geologist, depending on observations made in the field. Samples would not be adjusted beyond the maximum drilling depth identified in **Table 1**. Table 1 summarizes the sample quantities by method, location and depth.

Table 1 Sample Quantities by Exploration Area

Exploration Area	Approximate Number	Maximum Drilling Depth (feet below ground surface)
<b>Embankment Investigations</b>		
Cone Penetrometer Testing	164	100
Hollow Stem Auger	57	100
<b>Borrow Area Investigations</b>		
Hollow Stem Auger	13	15
Hand Auger	110	3-10
<b>Pipeline Area Investigations</b>		
Hollow Stem Auger	12	15
<b>Bridge Area Investigations</b>		
Hollow Stem Auger	48	100
<b>Irrigation Crossings</b>		
Hollow Stem Auger	72	70

Drilling would include site preparation, mobilization of equipment, drilling, and backfilling the sample with cement grout. Boreholes would be backfilled with either soil cuttings, a cement-bentonite grout or completed as groundwater monitoring wells or inclinometers once drilling is complete. Each backfill material is determined by DWR, Reclamation or contractors based on the depth of the sample site. Backfilling and installation will be in accordance with Fresno and Kings Counties' Environmental Health Departments' well permit requirements. Boreholes would be

backfilled within 24 hours of completion. If significant groundwater is encountered, the boreholes would be backfilled using tremie pipe methods<sup>4</sup>

Gravel, sand, and bentonite would be sourced from West Sacramento and brought to the site by the drilling contractor. The drill rigs would be equipped with a truck-mounted drill rig and use hollow stem augers. CPTs are conducted using a truck-mounted rig equipped with probes and technical equipment. A support truck would supply the water required for the rotary wash samples. The amount of water used depends on the sample depth but could range from approximately 65 to 70 gallons if slumping is observed in the borehole.

All samples would be vertical. HSA drilling methods would be used to explore the soil conditions to targeted depth listed in **Table 1**. Cuttings would be logged as they are retrieved from the borehole in order to assess changes in stratigraphy between sample intervals and to determine proper sampler choice.

The number of holes drilled per day will be dependent on the maximum drilling depth and distance between holes. Approximately two to three 15 and 32 foot-holes and one 100-foot hole would be drilled per day. A few of the deeper samples may take multiple days to complete. For samples using the HA method, five to six holes would be sampled per day. Soil would be collected from each location for examination and laboratory testing. Continuous soil samples from the HSA and HA drill holes would be geologically logged by an engineering geologist in accordance with *ASTM Standard D5434, Standard Guide for Field Logging of Subsurface Explorations of Soil and Rock*. Drill holes specific to the geologic investigation at bridge approaches would be logged in accordance with the *2010 California Department of Transportation Soil and Rock Logging, Classification, and Presentation Manual*. The methodologies used to determine the proposed geotechnical investigations within the embankment, within borrow areas, near utility pipelines, and near bridges are further discussed below.

### **2.2.1 SLC Embankment Investigations**

CPT and HSA drilling sampling would occur along the SLC embankment which is primarily composed of compacted mixtures of sediment and gravel derived from on- and off-site sources. Data from CPT samples within the embankment would assist in interpreting locations of HSAs to be drilled. Therefore, CPTs would be conducted first and HSA sample locations may be adjusted based on the CPT data. The embankment investigations would be evenly spaced at 1,250 feet apart for CPT samples and 5,000 feet apart for HSA. Between MP 122.0 and MP 128.7, the spacing would be decreased to 1,000 feet for CPT drilling and 2,500 feet for HSA drilling. The spacing of sample locations is consistent with recommendations found in the 2000 US Army Corps of Engineers *Design and Construction of Levees Engineering Manual*. Samples would not be conducted in areas where existing CPT or HSA data exists from previous geological investigations.

In total, approximately 164 CPTs samples and 57 HSA samples will be collected. HSA drilling is proposed to a target depth of 40 to 100 feet below the ground surface (bgs). Seismic cone testing is

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<sup>4</sup> Tremie pipe method-Tremie pipe, which upper end connected to a hopper and lower end continuously submerged in fresh concrete, is used to place concrete at the exact location from a hopper at the surface. The reason to immerse the tremie pipe lower end is to prevent intermixing of both concrete and water.

proposed to 100 feet below ground surface at CPT samples locations on the embankment near priority bridges and near each check station. All other CPT samples are proposed to 40 feet bgs. HAS samples would have an outside diameter of 8.25 inches, while CPT samples would be 1.75 inches in diameter. Sample locations within the embankment will be backfilled with a cement-bentonite grout or completed as groundwater monitoring wells or inclinometers. Up to six sites adjacent to the SLC near Check Structure 17 could include monitoring wells or inclinometers.

## **2.2.2 Borrow Area Investigations**

Five borrow areas are proposed for as source material to raise Pools 17 and 18 embankments. The five borrow areas range between 35 acres and 215 acres. To adequately characterize each borrow area, the proposed samples would be spaced evenly using 4-acre and 10-acre grids, with a minimum of four samples per borrow area, spaced approximately 400 to 600 feet apart. Borrow areas are highly disturbed areas adjacent to the right-of-way consisting of dirt access roads and agricultural lands.

HSA samples would be 15 feet bgs and submitted for geotechnical analysis as described in the *Soil and Laboratory Testing* section below. HA samples would be augured to a maximum depth of 10 feet bgs and have an outside diameter of 2.5 inches. Selected soil samples from each HSA drill hole would be consolidated with two or three adjacent HA samples and submitted for potential contaminants analysis. In total 123, samples are proposed in the borrow areas: 13 HSA samples and 110 HA samples. All sample locations in the borrow areas will be backfilled with soil cuttings.

## **2.2.3 Pipeline Investigations**

Four samples would be drilled adjacent to each of the three abandoned pipelines to sample the soil for potential contaminants. Each sample would be drilled to an approximate depth of 15 feet bgs (5 feet below each pipeline depth). Sample depths would be adjusted if any signs of contamination are observed by the engineering geologist. A private utility locator would be hired to determine the exact location of each pipeline prior to drilling. In total, 12 samples are proposed near the abandoned pipelines. Pipeline investigations would occur within the right-of-way. Sample locations near the pipelines will be backfilled with a cement-bentonite grout.

## **2.2.4 Bridge Investigations**

At each of the eight bridge crossings, 6 HSA samples would be taken parallel to the bridge alignment, three on each side of the SLC. The depths of each sample would decrease in distance as the sample gets farther from the SLC. Samples closest to the SLC would be 100 feet bgs, the pair of samples at the approach of each bridge would be 60 feet bgs, and the outermost samples furthest from the SLC would be 20 feet bgs. In total, 48 drill samples are proposed for bridge exploration. The bridge samples would primarily occur within the right-of-way. Sample locations near the bridges will be backfilled with a cement-bentonite grout or completed as groundwater monitoring wells or inclinometers.

## **2.2.5 Irrigation Crossings Investigations**

At 36 irrigation crossings, 2 HSA samples would be taken 10-feet away from irrigation crossing on the left and right embankments. The depths of each sample would be 70 feet bgs to target 40 feet below the SLC invert. In total, 72 drill samples are proposed for exploration and will be within the

DWR right-of-way. Sample locations near the irrigation crossings will be backfilled with a cement-bentonite grout or completed as groundwater monitoring wells or inclinometers.

### **2.2.6 Soil and Laboratory Testing**

Standard penetration tests would be completed at each HSA sample location during drilling. The Project's design engineer would assist in selecting samples to submit for further geotechnical testing. Lab testing is anticipated to include various soil attributes, such as soil moisture content and density. Actual soil testing performed would depend on soils and soil conditions encountered in the field.

In the borrow areas, soil samples would be sent to the laboratory for asbestos, heavy metals, pesticides and pH testing. In addition, soil samples adjacent to the existing pipelines would be tested for similar constituents, as well as gasoline chemical products. Other materials of concern may be tested if field conditions indicate the possible presence of additional contaminants being present.

## **2.3 Proposed Action Implementation**

Activities associated with implementation of the geotechnical investigations would require a maximum of the following equipment to be used on-site: one or two drill rigs, a forklift, one water truck, one or two support trucks, and five pickup trucks. All equipment, with possible exception of the pickup trucks, would be diesel-powered and are anticipated to be used on-site for the duration of the geotechnical investigation activities. Different methods of geotechnical activities could occur at the same time in multiple locations. DWR, Reclamation, and its contractors would be required to adhere to all applicable best management practices identified in DWR's Climate Action Plan (DWR 2020), including but not limited to the following:

- Evaluate Project characteristics, including location, Project work flow, site conditions, and equipment performance requirements, to determine whether specifications of the use of equipment with repowered engines, electric drive trains, or other high efficiency technologies are appropriate and feasible for the Project or specific elements of the Project.
- Evaluate the feasibility and efficacy of performing on-site material hauling with trucks equipped with on-road engines.
- Ensure that all feasible avenues have been explored for providing an electrical service drop to the construction site for temporary construction power, if required. When generators must be used, use alternative fuels, such as propane or solar, to power generators to the maximum extent feasible.
- Limit deliveries of materials and equipment to the site to off peak traffic congestion hours.
- Minimize idling time by requiring that equipment be shut down after five minutes when not in use (as required by the state airborne toxics control measure, California Code of Regulations, Title 13, Section 2485). Provide clear signage that posts this requirement for workers at the entrances to the site and provide a plan for the enforcement of this requirement.
- Maintain all construction equipment in proper working condition and perform all preventative maintenance.

- Evaluate the feasibility of restricting all material hauling on public roadways to off-peak traffic congestion hours. During construction scheduling and execution minimize, to the extent possible, uses of public roadways that would increase traffic congestion.

Access to sample locations would be primarily through the use of existing access roads with the exception of borrow sites where drilling equipment would be driven overland to each point. Access roads adjacent to the SLC are comprised of heavily compacted materials for ease of travel for maintenance of the Aqueduct system. An average of 10 workers would be on-site to implement the Project. Workers would commute individually to the active site and park within designated staging areas. The initial staging areas would be located within the existing right-of-way along the SLC. As the geotechnical investigations move to new locations, equipment would move to new staging areas to provide closer material access. Staging areas would be located in previously disturbed areas that have been/are used for equipment storage and vehicular travel and parking. All equipment would be stored at a DWR operations and maintenance facility located at MP 142.2 and/or temporarily overnight in previously disturbed locations adjacent to the SLC. The average commute would be up to an approximate 50-mile round trip.

During the investigations, soil to be tested would be stored in appropriate bags and core boxes within a secured area in an on-site container. Cuttings that are not sent to the lab for testing would either be placed back downhole or be spread around the drill location. The site would be returned to preexisting conditions above ground once each exploration activity is completed. Each individual geotechnical sample is anticipated to be completed within one working day and would typically be backfilled on the same day.

All equipment and materials would be transported to the Project area on public highways and local roads using standard transport equipment. Primary access to the Project area would be provided along existing roads along the SLC from Interstate 5 (I-5). The equipment would be offloaded on-site within the staging areas and then mobilized to each drilling location. Traffic control is not anticipated to be required.

The geotechnical investigations would occur over an approximate 8-month period, currently anticipated to begin in the late summer of 2021. The schedule includes site preparation/staging, sampling, and site restoration. Site restoration includes backfilling of all boreholes and restoring the surface of all sites to original grade prior to sampling.

### **2.3.1 Environmental Commitments/Mitigation Measures**

The DWR shall implement monitoring and Environmental Commitments (EC's)/Mitigation Measures (MMs) to avoid and/or reduce the impacts to the surrounding environment.

#### ***Environmental Commitments/Mitigation Measures***

##### **Biological Resources**

**Measure BIO 1 – Pre-Activity Surveys:** A qualified biologist shall conduct pre-activity surveys of each drilling site and off-road access route within 30 days of initiation of project activities. The pre-

activity assessment surveys of the work area will identify and flag special-status wildlife resources including canid dens, special-status plants, and nesting birds for avoidance.

Prior to initiation of work activities in sensitive resources, the qualified biological monitor shall survey the drilling activity area for any wildlife to ensure individuals are allowed to move out of harm's way during the daily site activities. No nests or dens will be removed or otherwise affected.

**Measure BIO 2 – Environmental Awareness Training:** Prior to work beginning, a Worker Environmental Awareness Program (WEAP) training will be conducted for construction personnel by a qualified biologist. The WEAP training will focus on special-status resources known to occur within the AOI, as well as measures required to avoid impacts to these resources.

**Measure BIO 3 – Bird Nest Avoidance:** For areas where there are known raptor nests or burrowing owls within 250 feet of the drilling locations, work will be scheduled prior to the nesting season, as feasible.

If project-related activities are scheduled during the nesting season (typically February 1 to August 31), focused nest surveys of affected work areas shall be conducted by a qualified biologist within two weeks prior to the beginning of work activities for ground, canopy or man-made structure nesters. The qualified biologist shall survey the area for nests within a minimum of 250-foot radius around project activities.

If the survey identifies an active nest, the qualified biologist shall flag the location and coordinate with construction personnel to modify boring locations to an area outside of a buffer as determined by the qualified biologist in the field. The buffer shall be delineated and shall be in effect throughout construction (for each boring location this should be less than one day) or until the nest is no longer active (i.e., the young are no longer being fed by their parent(s)). The buffer(s) shall be determined based upon the life history of the individual species, including their sensitivity to noise, vibration, ambient levels of human activity and general disturbance, the current site conditions (screening vegetation, terrain, etc.) and the various project-related activities necessary to implement the project. The qualified biologist shall be onsite during the initiation of project activities and if there is a change in the level of activity (i.e., noise level, etc.) to monitor the nest. The buffer between the construction activities and the active nest will ensure that nesting activities are not interrupted.

If no active nests are found, project activities may proceed without modification.

**Measure BIO 4 – Drilling Location Survey and Avoidance:** During boring activities near sensitive resources, a qualified biological monitor will accompany drilling teams at each drilling location. If dens, burrows, or sensitive vegetation are present within the work area, the qualified biologist will coordinate with construction personnel to modify boring locations or off road access routes to avoid these features. A buffer between potentially active canid dens or potential special-status small mammal burrows and the active work area shall be no less than 50 feet. The biological monitor shall have the authority to approve drilling locations and off-road access routes and to halt construction activities if special status species are present. The monitor will maintain an electronic log of survey results and drilling location modifications resulting from monitoring activities.

**Measure BIO 5 – Vehicle Speed Limit:** Except on Federal, State, or County roadways, work-related vehicles will adhere to a speed limit of 15 miles per hour. Vehicular traffic to and from the project site shall use existing routes of travel. Cross country vehicle and equipment use outside designated work areas shall be prohibited. Access roads that are planned for use during construction shall not extend beyond the planned impact area. All vehicle traffic shall be contained within the planned impact area or in previously disturbed areas.

**Measure BIO 6 – Timing of Work:** Nighttime work will be avoided to avoid active periods of species such as the San Joaquin kit fox.

**Measure BIO 7 – Open Holes:** Any unfilled holes that may need to be left overnight will be covered and weighted to prevent animals from becoming trapped inside.

**Measure BIO 8 – Trash:** Any food scraps or other trash items will be stored in wildlife-proof containers and removed offsite, as needed to avoid attracting any special-status species or their predators (i.e., common ravens, coyotes, or feral dogs) to the work areas.

## **Cultural Resources**

**CUL-1: Construction Worker Cultural Resources Sensitivity Training.** Prior to the start of geotechnical investigations, DWR shall retain and direct a Qualified Archaeologist, defined as an archaeologist meeting the Secretary of the Interior’s Professional Qualification Standards for Archaeology (36 CFR Part 61) with expertise in California archaeology, to prepare a cultural resources awareness and sensitivity training module for all personnel involved in field activities. The training module shall include a presentation that covers, at a minimum, the types of cultural resources that may be encountered, including tribal cultural resources, regulatory protections for cultural and tribal cultural resources, including confidentiality requirements for archaeological resource locations, and of the proper procedures to be enacted in the event of an inadvertent discovery of archaeological resources or human remains. Personnel shall acknowledge these requirements by signing a training attendance sheet. The Qualified Archaeologist, or an archaeologist working under their direct supervision, shall present the training at the initial kickoff or tailgate meeting. Subsequent trainings shall be given on an as-needed basis as new field personnel join the Project. DWR shall ensure that construction personnel are made available for and attend the training, and shall retain documentation demonstrating attendance.

**CUL-2: Pre-Construction Cultural Resources Surveys.** Prior to the start of geotechnical investigations on parcels that have not been surveyed, a Qualified Archaeologist meeting the Secretary of the Interior’s Professional Qualifications Standards for archaeology, or an archaeologist working under their direct supervision, shall conduct a pre-construction cultural resources survey of the APE. The survey shall document cultural resources potentially qualifying as historic properties under Section 106 and/or historical resources, unique archaeological resources, and/or tribal cultural resources under CEQA. The Qualified Archaeologist shall document the results of the survey in a report addendum (or technical memorandum) and append Department of Parks and Recreation (DPR) 523 forms for resources encountered during the survey. The Qualified Archaeologist shall submit the report to DWR and Reclamation within 5 business days after completion of the survey. The Qualified Archaeologist shall submit the final documents to the

Southern San Joaquin Valley Information Center. In the event cultural resources potentially qualifying as historic properties under Section 106 and historical resources, unique archaeological resources, or tribal cultural resources under CEQA are identified during the survey, they shall be treated in accordance with Mitigation Measure CUL-3.

**CUL-3: Avoidance of Cultural Resources.** In the event that cultural resources potentially qualifying as historic properties under Section 106 and/or historical resources, unique archaeological resources, and/or tribal cultural resources under CEQA are encountered during pre-construction surveys, they shall be avoided and preserved in place. Any planned geotechnical investigation locations shall be moved to avoid identified cultural resources. Avoided cultural resources shall be designated Environmentally Sensitive Areas and demarcated as exclusion zones through the use of temporary flagging or fencing and signage. Archaeological resources shall not be marked as such in order to discourage unauthorized disturbance or collection of artifacts. The Qualified Archaeologist, or their designee, shall periodically inspect designated Environmentally Sensitive Areas for the duration of Project activities in the vicinity to ensure that flagging/fencing and signage remains intact and no incursions into exclusion zones have occurred. Upon completion of all Project-related activities in the vicinity of a designated Environmentally Sensitive Area, all temporary flagging/fencing and signage shall be removed.

**CUL-4: Unanticipated Discovery Protocol for Cultural Resources.** In the event of the unanticipated discovery of archaeological materials during the geotechnical investigations, DWR or its contractor shall immediately cease all work activities in the area (within approximately 100 feet) of the discovery until the Qualified Archaeologist has inspected the discovery and conferred with DWR and Reclamation on the potential significance of the resource. If the discovered materials are potential tribal cultural resources, affiliated Native American tribes will be notified and provided an opportunity to participate in the evaluation of the find.

If it is determined that a discovered archaeological resource constitutes a historic property under Section 106 and/or a historical resource, unique archaeological resource, and/or tribal cultural resource under CEQA, avoidance and preservation in place shall be the preferred manner of mitigation. If avoidance is feasible, the procedures outlined in Mitigation Measure CUL-3 shall be followed.

If avoidance and preservation in place is not feasible and data recovery through excavation is the only feasible mitigation available, a treatment plan shall be prepared and implemented by the Qualified Archaeologist in consultation with DWR and Reclamation. The treatment plan shall provide for the adequate recovery of the scientifically consequential information. DWR and Reclamation shall consult with appropriate Native American representatives in determining treatment for indigenous resources to ensure that cultural values ascribed to the resource, beyond those that are scientifically important, are considered. DWR and Reclamation shall also consult with appropriate consulting parties and the California SHPO during the development of treatment.

**CUL-5 – Unanticipated Discovery Protocol for Human Remains:** If human remains are discovered on Federal land during the geotechnical investigations, all work shall immediately halt within 100 feet of the find and the provisions of the Native American Graves Protection and

Repatriation Act shall be followed. If human remains are uncovered on State land or private land during the geotechnical investigations, all work shall immediately halt within 100 feet of the find and the procedures and protocols set forth in CEQA Guidelines Section 15064.5(e)(1), California Health and Safety Code Section 7050.5(c), and PRC Section 5097.98 shall be followed.

## **Geology and Soils**

**GEO-1 – Retention of a Qualified Paleontologist:** Prior to the start of the geotechnical investigation, DWR shall retain a Qualified Paleontologist who meets the professional criteria established by the Society of Vertebrate Paleontology (SVP, 2010) to implement the paleontological resources mitigation measures for the Proposed Project.

**GEO-2 – Paleontological Resources Sensitivity Training:** Prior to the start of the geotechnical investigation, the Qualified Paleontologist, or their designee, shall conduct paleontological resources awareness training for onsite personnel. The training session shall focus on how to identify paleontological resources that may be encountered during the geotechnical investigation and the procedures to be followed in the event of their discovery. DWR shall ensure onsite personnel are made available for and attend the training and retain documentation demonstrating attendance.

**GEO-3 – Paleontological Monitoring:** Full-time paleontological resources monitoring shall be required for geotechnical investigations in areas mapped as early Pleistocene deposits (Qc) (between MP 142 and MP 143 and between MP 169 and MP 171). Part-time paleontological monitoring (or periodic spot checks) shall be required for geotechnical investigations in Late Pleistocene to Holocene alluvial deposits (Qa and Qf). Paleontological monitoring shall not be required for any geotechnical investigation methods that do not produce visible spoils that could contain identifiable fossils. Paleontological monitoring shall be conducted by a monitor who meets the professional criteria established by the Society of Vertebrate Paleontology (SVP, 2010) working under the direct supervision of the Qualified Paleontologist. Monitoring can be reduced, or ceased entirely, if determined adequate by the Qualified Paleontologist. The paleontological monitor shall collect any identifiable fossils encountered during the geotechnical investigation. If onsite personnel discover potential fossils during the geotechnical investigation when a paleontological monitor is not present, they shall set aside the fossil materials and notify the Qualified Paleontologist.

**GEO-4 – Paleontological Resources Treatment and Disposition:** Significant fossils (i.e., those that meet the paleontological resources significance criteria outlined in Shapiro and Clark [2021]) shall be prepared to the point of identification and cataloged. Significant fossils shall be curated at a public, non-profit institution with a research interest in the material and with retrievable storage, such as the LACM, if such an institution agrees to accept the fossils. If no institution accepts the fossil collection, then the fossils may be donated to a local museum, historical society, school, or other institution for educational purposes. Accompanying notes, reports, maps, and photographs shall also be filed with the final repository.

**GEO-5 – Paleontological Resources Monitoring Report:** Upon completion of the geotechnical investigation, the Qualified Paleontologist shall prepare a report summarizing the results of the monitoring efforts. The report shall be submitted to DWR and Reclamation to signify the satisfactory completion of required paleontological mitigation measures. If significant fossils are discovered, the report shall also be submitted to the appropriate repositories.

## **3 Affected Environment and Environmental Consequences**

### **3.1 Federal Required Resources Disclosures**

Department of Interior Regulations, Executive Orders, and Reclamation guidelines require a discussion of Native American Indian sacred sites, Indian Trust Assets, and Environmental Justice when preparing environmental documentation.

#### **3.1.1 Indian Trust Assets**

Indian Trust Assets are legal interests in assets that are held in trust by the U.S. for federally recognized Indian tribes or individuals. The nearest Indian Trust Asset a public domain allotment approximately 34 miles from the Proposed Action area.

#### **3.1.2 Indian Sacred Sites**

Executive Order 13007 (May 24, 1996) requires that federal agencies accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and avoids adversely affecting the physical integrity of such sacred sites. The Proposed Action would not limit access to and ceremonial use of Indian sacred sites on Federal lands by Indian religious practitioners or affect the physical integrity of such sacred sites. There would be no impacts to Indian sacred sites as a result of the Proposed Action.

#### **3.1.3 Environmental Justice**

Executive Order 12898 requires each federal agency to identify and address disproportionately high and adverse human health or environmental effects, including social and economic effects of its program, policies, and activities on minority populations and low-income populations. The Proposed Action would not cause dislocation, changes in employment, or increase flood, drought, or disease nor would it disproportionately impact economically disadvantaged or minority populations.

### **3.2 Evaluation of Environmental Impacts**

To satisfy the requirement to consider the environmental impacts of the Project pursuant to both NEPA and CEQA, potential effects on resources were determined using the CEQA Appendix G Initial Study checklist. For each environmental resource area evaluated, a brief description of the Affected Environment/Environmental Setting is provided in the checklist and where there is a possibility for the Project to affect a specific resource, the context and intensity of the impact are discussed to satisfy the requirements of NEPA. There are no environmental factors that have an impact that is identified as a “Potentially Significant Impact” as all potential significant impacts can be reduced to less than significant with the incorporation of environmental commitments/mitigation measures.

**DETERMINATION: (To be completed by the Lead Agency)**

On the basis of this initial study under CEQA:

- I find that the Proposed Project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- I find that although the Proposed Project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the Project have been made by or agreed to by the Project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- I find that the Proposed Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- I find that the Proposed Project MAY have a “potentially significant impact” or “potentially significant unless mitigated” impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- I find that although the Proposed Project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the Proposed Project, nothing further is required.

<i>Daniel Whisman</i>	6/29/2021
Signature	Date
Signature	Date

Under CEQA, there are four possible determinations of significance:

- **No Impact.** The Project will not have any measurable impact on the environment.
- **Less than Significant Impact.** The Project could have the potential to generate environmental impacts but impacts were determined to not have a significant effect on the environment.
- **Less than Significant with Mitigation Incorporated.** The Project could have the potential to generate environmental impacts that may have a significant effect on the environment. Mitigation is incorporated to reduce these impacts to levels that are less than significant.
- **Potentially Significant Impact.** The Project could have a potentially significant effect to the environment. Additional analysis is required to identify mitigation measures that could reduce potentially significant impacts to less than significant levels.

### 3.3 Initial Study Checklist

#### 3.3.1 Aesthetics

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

SLC Pools 17 and 18 are located in the County of Fresno, while Pools 20 and 21 are located in the County of Kings. The Proposed Action/Project area in its entirety is characterized by: the concrete lined SLC; compacted soils that serve as access roads and the SLC embankment; bridge crossings over the SLC; and borrow areas, which are located adjacent to the SLC and consist of agricultural fields or undeveloped parcels of land.

- a) Scenic vistas are defined as expansive views of distant landforms and aesthetic features from public vantage points, including areas designated as official scenic vistas along roadway corridors or otherwise designated by local jurisdictions. The Proposed Project area is not located in the immediate vicinity of an officially designated scenic vista or Scenic Highway by Fresno County (Caltrans 2020; County of Fresno 2000; County of Kings 2010). However, the Project area is adjacent to agricultural lands, which are considered scenic to Fresno County. Further, natural landforms such as surrounding hillsides may be seen in the far-off distance surrounding the SLC.

Activities associated with implementation of the Proposed Project would include site preparation/staging and sampling along the embankments and adjacent borrow sites. The Project area is remote and encompasses a 41-mile linear corridor composed of concrete structures, maintenance buildings, and compacted dirt embankments that also serve as access roads. It is unlikely that areas of disturbance and equipment located within the right-of-way

and adjacent to the SLC would be visible from public vantage points along local paved and dirt roadways. **No impact** to scenic vistas would occur.

- b) A scenic highway is officially designated as a State Scenic Highway when a local jurisdiction adopts a scenic corridor protection program, applies to Caltrans for scenic highway approval, and receives notification from Caltrans that the highway has been designated as an official Scenic Highway. Based on a review of the local General Plan and Caltrans List of Scenic Highways, the Project area is not located along a State Scenic Highway (Caltrans 2020). Therefore, the Proposed Project would not impact scenic resources, which include rock outcroppings, trees, or historic buildings within a designated State Scenic Highway corridor and **no impact** would occur.
- c) Public views of the area are provided very briefly to motorists traveling along local roadways and recreational visitors who may fish within the area. Activities associated with the Proposed Project include equipment staging and material stockpiling within and immediately adjacent to Pools 17, 18, 20 and 21 over an 8-month period. As such, the Proposed Project would not permanently or significantly impact the existing visual character and quality of public views of the Project site and immediate vicinity. Therefore, **no impact** would occur.
- d) The Proposed Project would not install or add new permanent sources of light or glare to the Project vicinity. No nighttime work would occur. No new facilities would be built that would be considered to have reflective surfaces. There would be no new sources of glare to affect daytime or nighttime views. There would be **no impact**.

### 3.3.2 Agricultural Resources

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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))?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

The Proposed Project area is entirely within or directly adjacent to the SLC right-of-way and dominated by the concrete lined canal, canal levee, gravel access roads, local county roads, bridge crossings, and agricultural/undeveloped parcels of land.

- a, e) The Proposed Project occurs entirely on land within or directly adjacent to the SLC. Pools 17, 18, 20 and 21 are surrounded by lands designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. Some borrow areas and areas adjacent to bridges are located within land zoned for Agriculture or currently within agricultural use. Crop information for the Project’s area shows that some borrow sites where sampling would occur are currently cultivating pistachios and or almonds; however, the majority of the borrow areas are within idle agricultural lands that have not been cultivated in the last three years. To the furthest extent possible, geotechnical investigation contractors, Reclamation, and DWR would avoid impacting active agricultural operations by selecting sample areas that may be fallow, inactive or otherwise less desirable in agricultural soil characteristics. Prior to any geotechnical investigation, Reclamation and DWR would obtain permission from landowners to access areas that are not within Reclamation or DWR jurisdiction for geotechnical investigation activities. Potential impacts to agricultural land would be temporary. Once geotechnical investigations are complete, sampling sites would be backfilled and surface soils within the Project areas would be returned to preexisting conditions. The Project does not involve any changes to current General Plan land use or zoning designations. The Proposed Project would not result in the permanent conversion of farmland to non-agricultural use. Impacts would be **less than significant**.
- b,c,d) The Project area does not contain lands enrolled under the Williamson Act (County of Fresno 2020; County of Kings 2020). Furthermore, there are no forestry resources within the Proposed Project area. Therefore, there would be **no impact** since there would be no conflict with a Williamson Act Contract or existing zoning of forest land or cause rezoning of forest land, timberland, or timberland zoned for Timberland Production.

### 3.3.3 Air Quality

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Substantially alter air movement, moisture, or temperature, or cause any substantial change in climate?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

The proposed investigation sites are located along the SLC in Fresno and Kings Counties within the San Joaquin Valley Air Basin (SJVAB), which is under the jurisdiction of the San Joaquin Valley Air Pollution Control District (SJVAPCD).

- a) The Clean Air Act (CAA) requires each state to prepare an air quality control plan, referred to as a State Implementation Plan (SIP). The SIP is a living document that is periodically modified to reflect the latest emission inventories, planning documents, and rules and regulations of air basins as reported by agencies with jurisdictions over them. The U.S. Environmental Protection Agency (EPA) has developed *de minimis* conformity thresholds to ensure that federal Projects conform to applicable SIPs so that they do not interfere with strategies to obtain National Ambient Air Quality Standards. **Table 2** summarizes the applicable U.S. EPA's *de minimis* conformity thresholds.

Table 2 Federal De Minimis Thresholds

Pollutant	Area Type	Tons/Year
Ozone (VOC or NOx)	Serious Nonattainment	50
	Severe Nonattainment	25
	Extreme Nonattainment	10
	Other nonattainment areas outside an ozone transport region	100
Other Ozone Nonattainment Areas Inside an Ozone Transport Region	VOC	50
	NOx	100

Table 2 Federal De Minimis Thresholds

Pollutant	Area Type	Tons/Year
Carbon monoxide, SO <sub>2</sub> , and NO <sub>2</sub>	All maintenance	100
PM <sub>10</sub>	Serious nonattainment	70
	Moderate nonattainment	100
PM <sub>2.5</sub>	Serious nonattainment	70
	Moderate nonattainment	100

SOURCE: U.S. EPA 2020b.

The SJVAPCD is responsible for implementing programs and regulations required by the CAA and the California CAA within the air basin. In this capacity, SJVAPCD has prepared plans to attain federal and state ambient air quality standards for which it has been designated as non-attainment. The air quality plans include emissions inventories that identify sources of air pollutants, evaluations for feasibility of implementing potential opportunities to reduce emissions, sophisticated computer modeling to estimate future levels of pollution, and a strategy for how air pollution would be further reduced.

In addition, the SJVAPCD has adopted a guidance document, *Guidance for Assessing and Mitigating Air Quality Impacts* (Guidance), to assist in the evaluation of air quality impacts of projects proposed within its jurisdiction (SJVAPCD 2015). The Guidance provides recommended procedures for evaluating potential air quality impacts during the environmental review process consistent with CEQA requirements and includes recommended thresholds of significance, mitigation measures, and background air quality information. It also includes recommended assessment methodologies for air toxics, odors, and greenhouse gas (GHG) emissions. **Table 3** presents the applicable SJVAPCD thresholds of significance. These thresholds are based on the SJVAPCD's New Source Review (NSR) offset requirements and are applied to evaluate regional impacts of Project-specific emissions of air pollutants and their impact on the regions ability to reach attainment (SJVAPCD 2015).

Table 3 SJVAPCD Criteria Air Pollutant Thresholds of Significance for Construction and Operation

Pollutant	Construction Emissions	Operational Emissions	
		Permitted Equipment and Activities	Non-Permitted Equipment and Activities
CO	100	100	100
NO <sub>x</sub>	10	10	10
ROG	10	10	10
Sox	27	27	27
PM <sub>10</sub>	15	15	15
PM <sub>2.5</sub>	15	15	15

SOURCE: SJVAPCD, 2015.

The SJVAPCD’s attainment plans demonstrate that Project-specific emissions below the offset thresholds would have a less-than-significant impact on air quality (SJVAPCD 2015). Furthermore, the U.S. EPA’s *de minimis* conformity thresholds were developed to ensure that federal projects conform to applicable SIPs. Therefore, projects with emissions below the U.S. EPA *de minimis* thresholds and the SJVAPCD thresholds of significance for criteria pollutants would be determined to not conflict or obstruct implementation of the SIP or the SJVAPCD’s air quality plans.

The Project would have short-term air quality impacts due to equipment operation and vehicle emissions for the proposed geotechnical investigation activities. Geotechnical investigation activities’ emissions were estimated using the California Emissions Estimator Model (CalEEMod), version 2016.3.2, and are presented in **Table 4**. Project-specific information was used for modeling when possible. CalEEMod assumptions and detailed output can be found in **Appendix B**.<sup>5</sup> The table shows the Project’s annual emissions and compares them to the U.S. EPA’s *de minimis* conformity thresholds and the SJVAPCD significance thresholds for construction.

Table 4 Project Geotechnical Investigation Activities’ Emissions

Activity Year	Estimated Annual Emissions (tons/year)					
	ROG	NO <sub>x</sub>	CO	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
2021	0.40	3.53	2.48	<0.01	0.15	0.12
SJVAPCD Significance Threshold	10	10	100	27	15	15
Federal <i>de minimis</i> Threshold	10	10	N/A	N/A	N/A	100
Exceeds Threshold?	No	No	No	No	No	No

SOURCE: Data compiled by ESA 2020.

As shown in **Table 4**, annual emissions would not exceed the applicable federal *de minimis* thresholds or the SJVAPCD significance thresholds for construction.

As discussed earlier, based on the SJVAPCD’s approach to air quality planning, as the Project’s emissions would be below applicable federal *de minimis* thresholds and SJVAPCD thresholds, the Project would be considered to be consistent with the SIP and the region’s air quality plans. As a result, the Proposed Project would result in a **less-than-significant** impact.

The Proposed Project would not result in operational (long-term) emissions as there are no proposed operational activities associated with this Project. Therefore, following the

<sup>5</sup> It should be noted that the Project’s anticipated duration was revised following CalEEMod modeling from six months to eight months. However, this change would not have a significant impact on emissions, as the amount of work to be conducted did not change. Although workers’ commute trips and vendor trips would increase, this would not have a significant impact on emissions associated with geotechnical investigation activity and would not bring the Project’s emissions above the SJVAPCD’s thresholds.

geotechnical investigation, no new emissions would be generated, and there would be no conflict with or obstruction of implementation of the regional air quality plan.

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

By its very nature, air pollution is largely a cumulative impact. No single project would likely be sufficient in size, by itself, to result in non-attainment of the regional air quality standards. Instead, a project’s emissions may be individually limited, but cumulatively considerable when taken in combination with past, present, and future development within the air basin. The non-attainment status of the air basin with respect to regional pollutants is a result of past and present development. Future attainment of state and federal ambient air quality standards is a function of successful implementation of SJVAPCD’s attainment plans and the SIP. Consequently, the SJVAPCD’s application of thresholds of significance for criteria pollutants and the U.S. EPA’s application of *de minimis* thresholds is a relevant way to determine whether a project’s individual emissions would have a cumulatively significant impact on air quality.

Per CEQA Guidelines Section 15064(h)(3), a Lead Agency may determine that a project’s incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan or mitigation program, including, but not limited to an air quality attainment plan or maintenance plan that provides specific requirements that will avoid or substantially lessen the cumulative problem within the geographic area in which the project is located (SJVAPCD 2015). As discussed above, the SJVAPCD has established thresholds of significance for criteria pollutant emissions, which are based on NSR offset requirements for stationary sources. Emission reductions achieved through implementation of offset requirements are a major component of the SJVAPCD’s air quality plans. Additionally, the federal *de minimis* conformity thresholds were developed by the U.S. EPA to ensure that federal projects conform to the applicable SIP and do not interfere with strategies to obtain the NAAQS. Thus, projects with emissions below the SJVAPCD’s thresholds of significance for criteria pollutants and the federal *de minimis* thresholds would be determined to comply with the SJVAPCD’s air quality plans and the SIP, respectively, (SJVAPCD 2015) and would not contribute a cumulatively considerable increase for these criteria pollutants.

As discussed under criterion a), Project emissions would be less than the SJVAPCD recommended thresholds of significance for construction emissions and the U.S. EPA’s *de minimis* thresholds, and the Project would not generate operational emissions. Therefore, the Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is in non-attainment under an applicable federal or state

ambient air quality standard. The impact with respect to criteria air pollutant emissions would be **less than significant**.

- c) Sensitive receptors are defined as facilities and land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples include schools, hospitals, and daycare centers. Residential areas are also considered sensitive to poor air quality because people usually stay home for extended periods of time, which results in greater exposure to ambient air quality.

The section of SLC in which the Project would occur primarily runs through agricultural fields and undeveloped land. The area is rural and predominately uninhabited, and there are no sensitive receptors within 1,000 feet of any of the proposed investigation sites. Additionally, the proposed investigations are transitory in nature and would not occur at any one site for an extended period of time. There is no operational component of the Project; thus, the Project would not generate operational emissions. If implemented, the Proposed Project would not expose sensitive receptors to substantial criteria pollutants due to the lack of receptors near the Project site and the short-term nature of the proposed activity. Therefore, the impact would be **less than significant**.

- d) There is no operational component of the Project; thus, the Project would not generate operational emissions. Regarding the proposed geotechnical investigations, diesel-powered construction equipment can generate short-term, non-persistent odors due to engine exhaust, but these dissipate quickly and would likely not be noticeable beyond the work site. Additionally, as discussed above, the area surrounding the Project site is rural and uninhabited. Therefore, the Project would not create odors that could impact a substantial number of people, and the impact would be **less than significant**.
- e) As discussed above, the proposed geotechnical investigations are anticipated to occur over an eight-month period, and there is no operational component of the Project. Additionally, the construction emissions estimated to result from the Project would fall below the applicable district and federal thresholds. The temporary nature of the Project and the absence of a significant finding with respect to applicable thresholds suggests that emissions resulting from Project construction would not be capable of substantially altering air movement, moisture, or temperature, or causing any substantial change in climate; there would be **no impact**.

### 3.3.4 Biological Resources

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans,	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
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, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

The following environmental setting is based on the Biological Resources Technical Report (BRTR) prepared by ESA and DWR (2021) in support of the Proposed Project (**Appendix C**). Biological resource information in the BRTR resulted from Project-specific surveys conducted by DWR biologists as well as environmental data collected in conjunction within biological surveys for ongoing maintenance projects since 2015, within the Project’s biological study area, considered the Area of Influence (AOI) as depicted in Appendix C. The AOI consists of all proposed geotechnical investigations which would occur on both sides of the SLC and adjacent private properties, covering approximately 3,814 acres, though the direct area of impact is focused on the intermittent geotechnical boring locations within the AOI. Surveys conducted within the AOI include vegetation mapping, habitat suitability, and focused surveys for blunt-nosed leopard lizard (*Gambelia sila*), burrowing owl (*Athene cunicularia*), Swainson’s hawk (*Buteo swainsoni*), and canid dens and burrows. A full list of surveys and associated projects are included in the BRTR (**Appendix C**).

- a) Most investigations would occur within the existing DWR/Reclamation right-of-way. Given the short duration of the impact and the relatively small acreage of direct impact associated with the

borings (relative to the AOI), coupled with the proposed avoidance and minimization measures, the project is expected to have a less than significant impact with mitigation incorporated on special-status species as outlined below.

### **Special-Status Plants**

Project-related activities have the potential to impact special-status plant species if present within the footprint of the geotechnical borings through the removal of plants and their habitat. Project-related activities have the potential to facilitate an increase in the disturbance and abundance of invasive plants by directly transporting invasive seed sources on site (and between sites) via equipment and by creating ideal seed beds through ground disturbance and resulting bare soils. However, the drilling equipment would largely remain on established roads, and the risk of propagation of invasive plant species is low and would be minimized or avoided through implementation of the mitigation program. Specifically, implementation of general measures and preconstruction surveys and biological monitoring required in **Mitigation Measures BIO-1 and BIO-4** will ensure that special-status plant species are identified and avoided by the drilling operations. Therefore, it is not anticipated that any special-status plants or habitat would be affected and impacts on special-status plants would be **less than significant**.

### **Special-Status Invertebrates, Amphibians, and Reptiles**

One western spadefoot and one San Joaquin coachwhip have been detected historically within the AOI, and the Crotch bumble bee has a medium potential to occur. These species may potentially be impacted as a result of geotechnical boring activities via direct mortality. However, the implementation of general measures, preconstruction surveys and biological monitoring as described in **Mitigation Measures BIO-1 and BIO-4** will ensure potential Crotch bumblebee, western spadefoot, and San Joaquin coachwhip that occur will be avoided by drilling operations. Therefore, it is not anticipated that special-status invertebrates, amphibians and reptiles would be affected and impacts on special-status amphibians would be **less than significant**.

### **Migratory and Nesting Birds**

Native resident and migratory bird species protected in accordance with the Migratory Bird Treaty Act, Bald & Golden Eagle Protection Act, and Sections 3503.5, 3505, and 3511 of the California Fish and Game Code may nest within 250 feet of the geotechnical boring investigations. Bird nests located in or near the project site may be impacted by direct mortality or impacted indirectly from human presence or ground vibrations and noise generated by heavy equipment. Implementation of **Mitigation Measures BIO-1 through BIO-4** requires a preconstruction surveys and establishment of an avoidance buffer around active nests to prevent unintended impacts during project construction. These mitigation measures ensure that impacts to nesting birds would be reduced to **less than significant**.

### **Special-Status Birds**

Project-related activities have the potential to impact 10 special-status birds (prairie falcon, long-billed curlew, Swainson's hawk, white-tailed kite, Northern harrier, burrowing owl, loggerhead shrike, California horned lark, and yellow-headed blackbird) and five additional species (merlin, tricolored blackbird, short-eared owl, golden eagle, and mountain plover) that have some potential to occur within the AOI. Breeding and nesting behavior may be impacted if nests are

located near geotechnical investigation-activities due to noise and equipment traffic (potentially causing direct mortality to adults sitting on nests, adult abandonment of the nest, eggs or young to be crushed, and/or reproductive failure). The nesting season extends from February 15 through September 1 (SHTAC 2000). Although no nest trees are anticipated to be removed within the proposed footprint for geotechnical borings, boring activities could disturb hawks nesting nearby. Any impacts to known nest locations will be avoided by conducting project activities outside of the nesting season as feasible. Implementation of **Mitigation Measures BIO-1, BIO-3, and BIO-4** would determine the presence of any nesting birds to avoid the nests by adjusting proposed boring locations. Geotechnical investigation activities could also temporarily disturb foraging habitat (e.g., annual and perennial grasslands, cropland). However, due to the limited time that activities would be conducted within foraging areas, impacts to foraging behavior are not expected. Additionally, implementation of **Mitigation Measures BIO-3 and BIO-4** would require that nesting bird surveys are conducted within the work areas prior to project activities. If bird nests are observed, the monitor would establish an appropriate buffer between the raptor nests and the work area. As a result, impacts to nesting raptors would be avoided.

Passerine birds and other special-status avian species that may nest in vegetation in close proximity to the geotechnical activities also may be affected. Implementation of **Mitigation Measures BIO-3 and BIO-4** would ensure that potential impacts would be minimized through the establishment of buffer areas.

Burrowing owls are common within the AOI. Project-related activities have the potential to impact occupied burrowing owl burrows. If any active burrows occur in the vicinity of the boring locations nesting behavior could be disturbed as a result of noise and traffic (potentially causing adult abandonment of the nest, eggs or young to be crushed, and/or reproductive failure) or by removing destroying burrows. Since the Project would only involve temporary work activity in the vicinity of habitat, long-term displacement or loss of habitat would not occur. **Mitigation Measures BIO-1 and BIO-3** would require pre-activity surveys of the work areas. Each drilling location would be modified by the biological monitor to ensure avoidance of burrowing owl burrows. As a result, impacts to burrowing owls would be avoided. With the implementation of preconstruction clearance surveys and avoidance/exclusion measures described in **Mitigation Measure BIO-3 and BIO-4**, the development and implementation of a WEAP as described in **Mitigation Measure BIO-2**, impacts to western burrowing owl would be reduced to a **less-than-significant** level.

### **Special-Status Mammals**

No giant kangaroo rat, San Joaquin kit fox or American badger (including occupied burrows/dens) were observed during surveys that have occurred throughout the AOI, including a Project-specific burrow/den search conducted in 2020. Canid dens and small mammal burrows have been observed within the AOI. Project-related activities have the potential to impact giant kangaroo rat, San Joaquin kit fox or American badger if they use the area as a corridor. Direct mortality via crushing of dens or burrows may occur as a result of the geotechnical boring; indirect impacts such as noise and equipment traffic may result in den or burrow abandonment. There is low potential for giant kangaroo rat to be present in the AOI associated with Pool 17,

though no occurrences have been documented within the AOI and no sign of giant kangaroo rat were detected at burrows during previous burrow and den surveys. Implementation of **Mitigation Measure BIO-1** would determine any occupied dens or burrows to be avoided during pre-activity surveys. Per **Mitigation Measure BIO-4**, the location of each drilling site would be modified by the biological monitor to ensure avoidance of canid or small mammal burrows. Boring investigations would be halted if a special-status mammal is found. As a result, impacts to mammals are expected to be **less than significant with mitigation incorporated**. With implementation of **Mitigation Measures BIO-1 through BIO-4**, the Proposed Project would not have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status. Therefore, impacts would be **less than significant with mitigation incorporated**.

Potential indirect impacts to special-status amphibians, reptiles, birds, and mammals such as trash, vehicular collision with construction equipment between boring locations, nighttime lighting, and wildlife being trapped in open holes will be avoided and minimized with implementation of **Measures BIO-5 through BIO-8**.

- b) No riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service occurs within the AOI. Therefore, **no impact** would occur.
- c) Although a formal aquatic resources delineation was not conducted, the Aqueduct is not a federally or State regulated water body in accordance with the federal or state Clean Water Act or California Fish and Game Code (Sections 1600 through 1616), respectively. Adjacent wetlands or potentially regulated drainages may occur within or adjacent to the project footprint that could potentially be affected by the Proposed Project but would be avoided through implementation of BMPs as described in **Mitigation Measure BIO-1**. Thus, impacts would be **less than significant with mitigation incorporated**.
- d) The Proposed Project is located within the Pacific Flyway, a major north-south route used by migratory birds. The Aqueduct supports a consistent, perennial source of fresh water that is utilized by birds for foraging and as a stop-over during spring and fall migration along the Pacific Flyway. Additionally, habitat located on the landside embankment of the Aqueduct provides foraging and breeding opportunities for a number of common terrestrial wildlife species; however, the Aqueduct presents a barrier for terrestrial wildlife to move/migrate in a west-to-east direction between large open space areas in the region.

It is possible that some migratory birds and common terrestrial wildlife species may temporarily avoid foraging or wading around or in the Aqueduct immediately adjacent to Project site during geotechnical boring activities, simply because of the mere presence of human activity and noises and vibrations that would be generated during construction activities. However, construction activities associated with the Proposed Project would not prevent avian or terrestrial species from using other portions of the Aqueduct for these purposes. As the nature of the geotechnical borings themselves are temporary and short-term, the Proposed Project would not impede wildlife movement in the region, nor would it prevent migratory birds or terrestrial wildlife from

using the Aqueduct. Although unlikely, geotechnical investigation activities could directly impact special-status or native wildlife through wildlife vehicle collisions. Geotechnical investigation and human-related trash could attract both special-status and common wildlife species to the area which could increase the probability of wildlife vehicle strikes. Implementation of **Mitigation Measures BIO-5 through BIO-8** would reduce the likelihood of wildlife vehicle collisions by requiring vehicles are operated at low speeds on the project site, allowing for increased visibility and reaction time during travel onsite. Implementation of **Mitigation Measures BIO-5 through BIO-8** would also reduce the attraction of food-related trash to wildlife in the area and reduce the chance of vehicle collisions. Any light generated by investigation activities at after dark could impact crepuscular and nocturnal wildlife movement and foraging in the work area. In addition, implementation of **Mitigation Measure BIO-6** would eliminate the need for lighting after dark by restricting work to daylight hours and avoid the active periods of species such as the San Joaquin kit fox. Implementation of **Mitigation Measure BIO-7** would require any unfilled holes that may need to be left overnight be covered and weighted to prevent animals from becoming trapped inside.

With implementation of **Mitigation Measures BIO-1 through BIO-8**, the Proposed Project would not have a substantial adverse effect on local or regional wildlife movement, nor would it present an impact to a wildlife movement corridor. Once a boring has been completed it will not be revisited again and each drilling activity is considered temporary in nature. As such, impacts to wildlife movement would be **less than significant with mitigation incorporated**.

- e) To the extent feasible, implementation of the Proposed Project would comply with applicable adopted county ordinances protecting biological resources; however, State agencies such as DWR are not subject to local biological ordinances. Nonetheless, no city, county or other local policies or ordinances applicable to protecting biological resource within the Project area have been identified; therefore, **no impact** would occur.
- f) The Area Southwest San Joaquin Valley Habitat Conservation Plan (HCP) and Natural Community Conservation Plan (NCCP) is currently in draft form. These documents have not yet been adopted and will not have an effect on the Proposed Project. No other proposed or existing HCP/NCCP extends into the Proposed Project site; therefore, **no impact** would occur.

### 3.3.5 Cultural Resources

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

This section relies on the information and findings presented in *California Department of Water Resources San Luis Canal Geotechnical Investigations Project, Kings and Fresno Counties, California: Cultural Resources Assessment Report* (Ehringer et al., 2021). That report details the results of the cultural resources study and includes: delineation of an Area of Potential Effects (APE); records searches conducted by the California Historical Resources Information System (CHRIS) Southern San Joaquin Valley Information Center (SSJVIC); Sacred Lands File (SLF) searches conducted by the California Native American Heritage Commission (NAHC); a review of historical topographic maps and aerial photographs; an assessment of subsurface archaeological sensitivity; and pedestrian field surveys. The cultural resources report is confidential and as such, is not available for public review.

### Summary of Identified Cultural Resources

A total of 18 cultural resources were identified in the APE (**Table 5**). These include 16 built environment resources and two archaeological resources (the two archaeological resources are isolated artifacts that were not re-located). Of these resources, 4 are considered historic properties pursuant to Section 106 of the National Historic Preservation Act (NHPA) and historical resources pursuant to CEQA Guidelines Section 15064.5, and 10 are being treated as historic properties (i.e. eligible for listing in the National Register of Historic Places) for the purposes of the undertaking only.

Table 5 Summary of Identified Cultural Resources

Resource Identifier	Description	NR Eligibility	CR Eligibility	Historic Property/ Historical Resource
P-10-006207/ P-16-000266	California Aqueduct (CAAQ)	Eligible (D)	Eligible (D)	Yes/Yes
P-10-006209	Clarkson Avenue Bridge	Eligible (D) (contributor to CAAQ)	Eligible (D) (contributor to CAAQ)	Yes/Yes
P-10-006246	Mt Whitney Avenue Bridge	Eligible (D) (contributor to CAAQ)	Eligible (D) (contributor to CAAQ)	Yes/Yes
P-10-006343	Precontact mano fragment (not re-located)	Not Eligible (D)	Not eligible (R)	No/No
P-10-006344	W. Oakland Avenue	Not Eligible (D)	Not Eligible (R)	No/No
P-10-006345	W. Clarkson Avenue	Not Eligible (D)	Not Eligible (R)	No/No

<b>Resource Identifier</b>	<b>Description</b>	<b>NR Eligibility</b>	<b>CR Eligibility</b>	<b>Historic Property/ Historical Resource</b>
P-10-007160	Coalinga Operations & Maintenance Subcenter	Eligible (R)	Eligible (R)	Yes/Yes (treated as both for purposes of Proposed Project/Undertaking)
P-16-000265	Plymouth Avenue Bridge	Eligible (D) (contributor to CAAQ)	Eligible (D) (contributor to CAAQ)	Yes/Yes
JPB-ISO-2	Precontact CCS biface (not re-located)	Not Eligible (R)	Not Eligible (R)	No/No
-	San Diego Avenue Bridge	Eligible (R) (contributor to CAAQ)	Eligible (R) (contributor to CAAQ)	Yes/Yes (treated as both for purposes of Proposed Project/Undertaking)
-	Highway 33 (Derrick Avenue) Bridge	Eligible (R) (contributor to CAAQ)	Eligible (R) (contributor to CAAQ)	Yes/Yes (treated as both for purposes of Proposed Project/Undertaking)
-	San Mateo Avenue Bridge	Eligible (R) (contributor to CAAQ)	Eligible (R) (contributor to CAAQ)	Yes/Yes (treated as both for purposes of Proposed Project/Undertaking)
-	Cerini Avenue Bridge	Eligible (R) (contributor to CAAQ)	Eligible (R) (contributor to CAAQ)	Yes/Yes (treated as both for purposes of Proposed Project/Undertaking)
-	Excelsior (Parkhurst) Avenue Bridge	Eligible (R) (contributor to CAAQ)	Eligible (R) (contributor to CAAQ)	Yes/Yes (treated as both for purposes of Proposed Project/Undertaking)
-	Jeffery Avenue Bridge	Eligible (R) (contributor to CAAQ)	Eligible (R) (contributor to CAAQ)	Yes/Yes (treated as both for purposes of Proposed Project/Undertaking)
-	Oakland Avenue Bridge	Eligible (R) (contributor to CAAQ)	Eligible (R) (contributor to CAAQ)	Yes/Yes (treated as both for purposes of Proposed Project/Undertaking)
-	Highway 145 (Fresno-Coalinga Road) Bridge	Eligible (R) (contributor to CAAQ)	Eligible (R) (contributor to CAAQ)	Yes/Yes (treated as both for purposes of Proposed Project/Undertaking)
ESA-LinerRaise-Built-001H	Two Quonset huts with a well pump/water tank	Eligible (U)	Eligible (U)	Yes/Yes (treated as both for purposes of Proposed Project/Undertaking)

Resource Identifier	Description	NR Eligibility	CR Eligibility	Historic Property/ Historical Resource
NR: National Register of Historic Places				
CR: California Register of Historical Resources				
D: Determined				
R: Recommended				
T: Unevaluated				

- a) Fourteen historic properties/historical resources are within the APE: P-10-006207/P-16-000266, P-10-006209, P-10-006246, P-10-007160, P-16-000265, San Diego Avenue Bridge, Highway 33 (Derrick Avenue) Bridge, San Mateo Avenue Bridge, Cerini Avenue Bridge, Excelsior (Parkhurst) Avenue Bridge, Jeffery Avenue Bridge, Oakland Avenue Bridge, Highway 145 (Fresno-Coalinga Road) Bridge, and ESA-LinerRaise-Built-001H.

Under Section 106 of the NHPA, an adverse effect could occur if the Proposed Project resulted in the physical demolition or alteration of historic properties such that their integrity was diminished in a manner that disqualified them from inclusion in the National Register. The Proposed Project would not alter the use, character, or materials of any of the 14 historic properties in the APE. The Proposed Project does not include the introduction of visual, atmospheric, or audible elements that would diminish the integrity of any of the 14 historic properties in the APE, aside from the temporary visual and audible elements associated with geotechnical borings. The Proposed Project also does not include the transfer, sale, or lease of any of the 14 historic properties in the APE. Therefore, the Proposed Project would have no adverse effect on any of the 14 historic properties in the APE.

Under CEQA, a significant impact could occur if the Proposed Project resulted in a substantial adverse change in the significance of an historical resource; such a change includes physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the historical resource is materially impaired. Material impairment includes demolition or alteration in an adverse manner to those physical characteristics of the historical resource that convey its historical significant and that justify its inclusion, or eligibility for inclusion, in the California Register. As noted in the previous paragraph, the Proposed Project does not include the physical alteration of any of the 14 historical resources in the APE. Any alterations to the immediate surroundings resulting from the geotechnical borings would be temporary since the Proposed Project does not include the construction of any new facilities. Therefore, the Proposed Project would have a **less than significant impact** to these 14 historical resources.

As discussed below under (b), no known archaeological resources would be affected or impacted by the Proposed Project. However, since the entirety of the APE could not be surveyed due to lack of landowner permission to access some areas (approximately 12 percent of the APE) and since the Project includes ground-disturbing activities, there remains potential that archaeological resources could be encountered, including those that may qualify as historic properties, pursuant to Section 106 of the NHPA or historical resources, pursuant to CEQA

Guidelines Section 15064.5. If archaeological resources are discovered, effects/impacts would be significant if Proposed Project activities result in an adverse effect to or cause a substantial adverse change in the significance of an archaeological resource that qualifies as a historic property/historical resource. **Mitigation Measures CUL-1, CUL-2, CUL-3, and CUL-4** require worker training, pre-construction surveys, avoidance of resources, and treatment of inadvertent discoveries. Therefore, impacts to archaeological resources that may be historic properties or historical resources would be **less than significant impact with mitigation incorporated.**

- b) The two archaeological resources previously recorded in the APE (P-10-006343, JPB-ISO-2) were not re-located, and no archaeological resources were identified within the APE, including those that qualify as historic properties, pursuant to Section 106 of the NHPA, historical resources, pursuant to CEQA Guidelines Section 15064.5, or unique archaeological resources, as defined in PRC Section 21083.2(g). The Proposed Project consists of small-diameter borings that could extend below the layers of previous disturbances. However, the majority of the APE has a low sensitivity for subsurface archaeological resources. It is unlikely that geotechnical borings would encounter intact significant archaeological deposits in low sensitivity areas. It is possible that geotechnical borings in the more sensitive areas of the APE (two southernmost portions of the APE) could encounter archaeological deposits; however, there are only four borings planned within the more sensitive areas and the chance of encountering archaeological resources is low. However, since the entirety of the APE could not be surveyed due to lack of landowner permission to access some areas (approximately 12 percent of the APE) and since the Project includes ground-disturbing activities, there remains potential that archaeological resources could be encountered. If archaeological resources are discovered, effects/impacts would be significant if Proposed Project activities result in an adverse effect to or cause a substantial adverse change in the significance of an archaeological resource. **Mitigation Measures CUL-1, CUL-2, CUL-3, and CUL-4** require worker training, pre-construction surveys, avoidance of resources, and treatment of inadvertent discoveries. Therefore, impacts to archaeological resources would be **less than significant impact with mitigation incorporated.**
- c) No human remains have been identified in the APE through archival research, field surveys, or Native American correspondence, including with the NAHC. Also, the land use designations for the APE do not include cemetery uses. Therefore, the Proposed Project is not anticipated to affect/impact any human remains. However, since the nature of the Proposed Project would involve ground-disturbing activities, it is possible that such actions could unearth, expose, or disturb previously unknown human remains. In the event that human remains are discovered during Proposed Project activities, effects/impacts on the human remains resulting from the Proposed Project would be significant if those remains are disturbed or damaged. **Mitigation Measure CUL-5** requires onsite personnel to cease work and follow appropriate Federal or State laws if human remains are discovered. Therefore, impacts to human remains would be **less than significant with mitigation incorporated.**

### 3.3.6 Energy

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during Project construction or operation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

DWR has adopted the DWR Climate Action Plan-Phase I: Greenhouse Gas Emissions Reduction Plan (GGERP), which details DWR’s efforts to reduce its GHG emissions consistent with Executive Order S-3-05 and the Global Warming Solutions Act of 2006 (Assembly Bill [AB] 32) (DWR 2012) (refer to Section 3.4.8, *Greenhouse Gas Emissions*). Section 12 of the GGERP outlines the steps that each DWR Project will take to demonstrate consistency with the GGERP. These steps include: (1) analysis of GHG emissions from construction of the Proposed Project (**Appendix B**), (2) determination that the construction emissions from the Project do not exceed the levels of construction emissions analyzed in the GGERP, (3) incorporation into the design of the Project DWR’s Project level GHG emissions reduction strategies, (4) determination that the Project does not conflict with DWR’s ability to implement any of the “Specific Action” GHG emissions reduction measures identified in the GGERP, and (5) determination that the Project would not add electricity demands to the SWP system that could alter DWR’s emissions reduction trajectory in such a way as to impede its ability to meet its emissions reduction goals.

- a) Equipment needed for the geotechnical investigations includes two drill rigs, a forklift, one water truck, one or two support trucks, and five pickup trucks. There would be an increase in fuel demand (gasoline and diesel) that would result from the use of construction tools and equipment, truck trips to haul backfill to the site, and vehicle trips generated from construction workers commuting to and from the site. DWR has prepared a GGERP to comply with Executive Order S-3-05 and AB 32 (DWR 2020). The GGERP Consistency Determination Checklist is a form to be used by DWR project managers to document a project is consistent with the goals and policies set forth in the GGERP when DWR is a Lead Agency and when contractors or outside labor and equipment are used to implement the project. A Consistency Determination Checklist documenting that the Project has met each of the required elements of the GGERP is included in Appendix B. DWR, Reclamation, and its contractors would be required to adhere to all applicable best management practices identified in DWR’s Climate Action Plan (DWR 2020). Energy consumed during geotechnical investigation activities of the Proposed Project would not result in the wasteful, inefficient, and unnecessary consumption of energy. Therefore, impacts associated with construction of the Proposed Project would be **less than significant**.

Once the proposed investigations are complete, there would be no further activity and, thus, no operational component of the Project. Therefore, the Proposed Project would not result in an increase in operational energy use and would not result in the wasteful, inefficient, or unnecessary consumption of energy.

- b) As discussed above, during construction the Proposed Project would be required to limit idling time of construction equipment to 5 minutes, in accordance with Title 13, Chapter 10 of the California Code of Regulations. In addition, the Proposed Project would comply with the DWR GGERP. There would be no operational component of the Project and, thus, no increase in energy demand following the temporary construction activity. Therefore, the Proposed Project would be consistent with applicable energy efficiency policies and standards and would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. Therefore, the impact would be **less than significant**.

### 3.3.7 Geology and Soils

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on expansive soil, as defined in Table 18-1-B of the most recently adopted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
Uniform Building Code (1994) creating substantial risks to life or property?				
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Fresno and Kings Counties are located within the Great Valley geomorphic province of California. The geology of the Great Valley is typified by thick sequences of alluvial sediments derived primarily from erosion of the Sierra Nevada to the east, and to a lesser extent erosion of the Klamath Mountains and Cascade Range to the north (San Joaquin Valley Geology 2016). The Great Valley occupies a trough created by tectonic forces related to the collision of the Pacific and North American Plates. The trough is composed of fine-grained clay, sandy clay, stream, and lake deposits susceptible to compaction (U.S. Geological Society [USGS] 2020). Deep soils encountered during construction of the SLC within the Proposed Project area were predominately complex interbedded thin layers of light brown colored sand and clay. The analysis of paleontological resources relies on the information and findings presented in *San Luis Canal Geotechnical Investigations Project, Kings and Fresno Counties, California: Paleontological Resources Assessment Report* (Shapiro and Clark, 2021). That report details the results of the paleontological resources study, which examined the geological and paleontological background and potential of the Proposed Project area, and included records searches through the Natural History Museum of Los Angeles County (LACM) and University of California Museum of Paleontology (UCMP); a review of geologic maps; a review of pedestrian field survey results; and a subsurface sensitivity assessment.

The results of the LACM records search indicate that no known vertebrate fossil localities have been recorded within the Proposed Project area. However, the LACM indicates that fossil localities are found in the region from the same sedimentary deposits that occur in the Proposed Project area, either at surface or at depth (**Table 6**).

Table 6 LACM Fossil Localities

Locality No. (LACM)	Formation	Taxa	Depth	Approx. Distance from Project
VP 2720	Tulare Formation	Borophagine canid ( <i>Hyaenognathus pachyodon</i> )	Unknown	50 mi S
VP CIT 117	Unknown formation (Plesitoece; blue shale)	Horse ( <i>Equus</i> )	425 ft bgs	28 mi E

Locality No. (LACM)	Formation	Taxa	Depth	Approx. Distance from Project
VP 4087	Unknown formation (Pleistocene)	Mammoth ( <i>Mammuthus</i> )	Unknown	90 mi SE
VP 6701	Unknown formation (Pleistocene; green sand)	Mammoth ( <i>Mammuthus</i> )	6 ft bgs	90 mi SE
VP 7844-7845	Unknown formation (Pleistocene; discontinuous light grey silty sandstone)	Deer ( <i>Cervidae</i> cf. <i>Odocoileus</i> ); and microvertebrate assemblage including lizards ( <i>Lacertilia</i> ), snakes ( <i>Serpentes</i> ), rodents ( <i>Rodentia</i> ), and rabbits/hares/pikas ( <i>Lagomorpha</i> )	Unknown	40 mi SE
VP 7254	Unknown formation (Pleistocene, fan deposit, medium argillaceous sand with considerable pebble content)	Elephant family ( <i>Proboscidea</i> )	Unknown	40 mi NE

VP: Vertebrate Paleontology  
IP: Invertebrate Paleontology  
Source: Bell 2021

A review of the UCMP records for Kings County yielded 864 records, which nearly all are marine or non-marine (e.g., the mussel *Gonidea*) invertebrates. Only three vertebrates are known from the Pleistocene, including one horse and two fish. A review of the UCMP records for Fresno County yielded 550 Holocene or Pleistocene specimens. A total of 168 of those records are from the Aera Oil Seep; however, the locations are unknown. A total of 162 vertebrate specimens representing mammals, birds, reptiles, and fish were recorded close to the surface in the town of Tranquility (located approximately 11 miles northeast of the Proposed Project area).

A review of geologic maps indicates that the majority of the Proposed Project area is mainly underlain by Quaternary alluvium (Qa) deposits. However, there are also small portions of the Proposed Project that are mapped as underlain by Great Valley Fan deposits (Qf) and Pleistocene non-marine deposits (Qc). Qa is described as alluvial gravel, sand, and clay of Holocene age. Qf is described as Great Valley Fan deposits of Holocene age. Qc is described as Pleistocene non-marine deposits.

Pedestrian field surveys of the Proposed Project area conducted between September 2020 and February 2021 yielded the identification of a number of fossils (including marine invertebrates) in over 30 locations.

The geologic mapping and LACM and UCMP results were used to assign paleontological sensitivity to the geologic units present in the Proposed Project following the guidelines of the Society of Vertebrate Paleontology (SVP, 2010) and are as follows:

### Late Pleistocene to Holocene Deposits

- **Alluvium (Qa)** – unconsolidated clay, silt, sand, and gravel recently deposited parallel to localized stream valleys and/or spread more regionally onto alluvial flats of larger river valleys; sandy sediment generally more dominant than gravelly sediment. *Low potential increasing with depth.*
- **Alluvial Fan (Qf)** – unconsolidated boulders, cobbles, gravel, sand, and silt recently deposited where a river or stream issues from a confined valley or canyon; sediment typically deposited in a fan-shaped cone; gravelly sediment generally more dominant than sandy sediment. *Low potential increasing with depth.*

### Early Pleistocene Deposits

- **Non-marine (Qc)** – older alluvium, older fan deposits in the Great Valley. *High potential at surface.*

a.i-iv) The Proposed Project area is not located within an earthquake fault zone or a liquefaction- or landslide-prone area (Fresno County 2000; Kings County 2010). In general, Southern California is seismically active, with most locations in proximity to faults that can produce detectable seismic ground shaking. The Proposed Project would likely be subject to strong seismic ground shaking during a substantial seismologic event. However, the Project area is remote and away from any occupied structures and the Project does not include building permanent structures that would create the risk of loss, injury, or death involving strong ground shaking. Therefore, impacts related to strong seismic ground shaking would not occur. The Project would not exacerbate seismic hazards or ground shaking in the area. **No impacts** would occur.

b) Existing soils along the SLC levee and construction can be characterized as highly disturbed, compacted mixtures of sediment and gravel derived from on- and off-site sources. Existing soils in borrow areas and other investigation sites outside of the SLC are indicative of agricultural soils largely consisting of different varieties of clay loams with smaller areas containing sandy loams (USDA 2021). Implementation of the Proposed Project would require ground-disturbing activities which would involve the disturbance and exposure of surface soils to rain and wind. During the investigations, soil to be tested would be stored in appropriate bags, and core boxes within a secured container on-site in a disturbed area. Boreholes would be backfilled at the end of the geotechnical exploration activities. Cuttings would be spread adjacent to the boreholes to match to preexisting grades. No substantial soil erosion or loss of topsoil is anticipated. Therefore, **no impact** associated with erosion of soils would occur.

c) Non-seismically-induced geologic hazards such as landslides, lateral spreading, settlement, and slope failure can be caused by unstable soils. Subsidence of the ground surface occurs under static conditions (i.e., due to consolidation settlement from overlying load or long-

term water or mineral extraction), but can also be accelerated and accentuated by earthquakes. The extraction of fluid resources from subsurface sedimentary layers (i.e., water or oil) can result in subsidence from the removal of supporting layers in the geologic formation. Settlement of loose, unconsolidated soils generally occurs slowly, but can cause significant structural damage if structures are not properly designed.

The Proposed Project would not involve the construction of any new structures that would be adversely affected by unstable soils. Similar to impacts described above for Questions 3.3.7(a)(ii) through 3.3.7(a)(iv), during implementation of Project investigation activities, unstable soils could expose persons working in the Project area to hazards while operating heavy equipment. Geotechnical investigation activities include sample sites and deeper borings that would remove small amounts of subsurface material from the bore holes. The bore holes would be backfilled with a cement mixture. The Project activities would not elicit lateral spreading, subsidence or collapse. Because the Project occurs in an area flat topography between zero to two percent slopes within agricultural areas, landslides are not expected to be a significant hazard within the Project area.

DWR, Reclamation, and its contractors would be required to adhere to all California Division of Occupational Safety and Health (CalOSHA) requirements for working within active work sites that would ensure the safety of all workers onsite. Therefore, relative to existing conditions, the Proposed Project would not expose people or structures to new potential substantial adverse effects related to unstable soils. **No impact** would occur.

- d, e) Expansive soils are predominantly comprised of clays, which expand in volume when water is absorbed and shrink when the soil dries. Expansion is measured by shrink-swell potential, which is the volume change in soil with a gain in moisture. Soils with a moderate to high shrink-swell potential can cause damage to roads, buildings, and infrastructure (USDA 2021). The SLC geotechnical investigation activities would predominantly occur within the sloped, man-made levee embankment system where soils consist of compacted mixtures of disturbed sandy sediment and gravel. Proposed geotechnical investigations in areas surrounding the SLC structure would occur on lands with soils consisting of different varieties of clay to sandy loams. Therefore, the Project area and immediate vicinity may include expansive soil where clays are present. However, the Proposed Project would not involve the construction of any new structures or infrastructure. The Project's sampling activities would require the presence of an average of approximately 10 workers per day onsite, operating heavy equipment. Exposure of workers to expansive soils in an undeveloped area would not present risks to life or property. Therefore, relative to existing conditions, the Proposed Project would not expose people or structures to new potential substantial adverse effects related to expansive soils. There would be **no impact**.

The Proposed Project would not include the construction or operation of any septic tanks or alternative water disposal system. Therefore, **no impact** would occur.

- f) While there are no known fossil localities in the Proposed Project area, a large number of vertebrate fossils have been previously recorded in relatively close proximity from the same sedimentary deposits that occur in the Proposed Project area. Many of these were

encountered at shallow depths close to the ground surface, which suggests that paleontological resources may be encountered at depth. The Late Pleistocene to Holocene deposits (Qa and Qf) within the Proposed Project area have a low paleontological sensitivity, though sensitivity increases with depth due to age. The early Pleistocene deposits (Qc) within the Proposed Project area have a high paleontological sensitivity.

Based on standard geological principles and similar encounters elsewhere in Kern and Fresno counties, there is a potential to encounter fossils at depth. Estimating the depth is difficult, but as fossils were recognized during the survey throughout the Proposed Project area's length, there is a potential to recover fossils near the surface. If any fossils were encountered during Proposed Project actions, and such fossils qualified as unique paleontological resources, effects/impacts on them would be significant if they were disturbed or damaged.

**GEO-1, GEO-2, GEO-3, GEO-4, and GEO-5** require retention of a Qualified Paleontologist, paleontological resources awareness training for onsite personnel, paleontological resources monitoring, treatment of significant fossils, and final reporting. Therefore, impacts to unique paleontological resources would be **less than significant with mitigation incorporated**.

### 3.3.8 Greenhouse Gas Emissions and Climate Change

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

GHG emissions worldwide cumulatively contribute to the significant adverse environmental impacts of global climate change. No single Project could generate sufficient GHG emissions on its own to noticeably change the global average temperature. The combination of GHG emissions from past, present, and future Projects in the San Joaquin Valley; the entire state of California; across the nation; and around the world contribute cumulatively to the phenomenon of global climate change and its associated environmental impacts.

a, b) The SJVAPCD does not recommend quantitative significance thresholds for the analysis of the impact of a project's GHG emissions on the environment. Instead, the SJVAPCD's approach relies on the application of performance-based standards to assess project-specific GHG emission impacts on global climate change. This is based on the principle that projects whose emissions have been reduced or mitigated consistent with Assembly Bill (AB) 32, the

California Global Warming Solutions Act of 2006, should be considered to have a less-than-significant impact on global climate change (SJVAPCD 2015).

In May 2012, DWR adopted the DWR GGERP, which details DWR’s efforts to reduce its GHG emissions consistent with Executive Order S-3-05 and AB 32 (DWR 2012; DWR 2020). DWR also adopted the Initial Study/Negative Declaration prepared for the GGERP in accordance with the CEQA Guidelines review and public process. The GGERP provides estimates of historical (back to 1990), current, and future GHG emissions related to operations, construction, maintenance, and business practices (e.g., building-related energy use). The GGERP specifies aggressive 2020 and 2050 emission reduction goals and identifies a list of GHG emissions reduction measures to achieve these goals.

Section 12 of the GGERP outlines the steps that each DWR project will take to demonstrate consistency with the GGERP. These steps include: (1) analysis of GHG emissions from construction of the proposed project, (2) determination that the construction emissions from the project do not exceed the levels of construction emissions analyzed in the GGERP, (3) incorporation into the design of the project DWR’s project level GHG emissions reduction strategies, (4) determination that the project does not conflict with DWR’s ability to implement any of the “Specific Action” GHG emissions reduction measures identified in the GGERP, and (5) determination that the project would not add electricity demands to the SWP system that could alter DWR’s emissions reduction trajectory in such a way as to impede its ability to meet its emissions reduction goals.

Consistent with these requirements, a GGERP Consistency Determination Checklist documenting that the Project has met each of the required elements is included in **Appendix B**. Based on the analysis provided in the GGERP and the demonstration that the Proposed Project is consistent with the GGERP and incorporation of all its’ BMPs, the Project is compliant with the applicable GHG emission reduction plan, as is required by the SJVAPCD; therefore, the impact with respect to GHG emissions is **less than significant**.

### 3.3.9 Hazards and Hazardous Materials

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

A hazardous material is 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 environment. State agencies regulating hazardous materials are the California Environmental Protection Agency (Cal/EPA) and the Office of Emergency Services (OES). Within the Cal/EPA, the DTSC has primary regulatory authority for hazardous materials regulation enforcement. State hazardous waste regulations are contained primarily in the California Code of Regulations (CCR) Title 22. California Division of Occupational Safety and Health (CalOSHA) has primary responsibility for developing and enforcing standards for safe workplaces and work practices in California in accordance with regulations specified in CCR Title 8. The Environmental Health Services Department and the Public Health Services Department enforces hazardous waste regulations and serves as the Certified Unified Program Agency (CUPA) for Fresno and Kings Counties, respectively.

- a) The Proposed Project would require the use of small quantities of hazardous materials such as diesel fuel, gasoline, oils, grease, equipment fluids, cleaning solutions and solvents, lubricant oils, and adhesives. During the Project, DWR, Reclamation and contractors handling, storing or transporting hazardous materials or wastes would comply with numerous hazardous materials regulations such as those described above that would reduce the risk of accidental release and provide protocols and notification requirements should an accidental release occur. By complying with relevant federal, State, and local laws, the Proposed Project would not result in a significant hazard to the public or to the environment through the routine transport, use, or disposal of hazardous materials during implementation of the Proposed Project.

Further, the Project does not include the construction of facilities that would operate and/or require the use of hazardous materials, therefore, once the investigations are complete, no impacts regarding hazardous materials would occur. Therefore, impacts would be **less than significant**.

- b) As discussed above in the response to Question 3.3.9(a), the Proposed Project would involve the routine use of hazardous materials during geotechnical investigation activities; the transport, use, storage and disposal of such hazardous materials would be required to comply with existing applicable federal, State and local regulations. Accidental spills of small amounts of these materials could occur during routine transport, use, storage or disposal, and could potentially injure workers, contaminate soil, and/or affect the groundwater within and around the Project area.

The small quantities of hazardous materials that would be used during geotechnical investigations would not be stored near the SLC. Any spills of these substances would be minimal and cleaned on-site. Contractors would be required impose stormwater BMPs for controlling site run-on and runoff. Therefore, potential impacts to the public or the environment related to reasonably foreseeable accident conditions involving hazardous materials would be **less than significant**.

- c, d,e,f) There are no schools located within one-quarter mile of the Project area. There are no identified hazardous material sites located within the Project area (DTSC 2020a; DTSC 2020b; SWRCB 2020). The Proposed Project would not be located on a hazardous materials site.

The nearest airport to the Project area is the New Coalinga Municipal Airport, located approximately 11.5 miles southwest of Pool 18. The Proposed Project is not located within an airport land use plan or within two miles of a public airport or public use airport.

Proposed Project activities are not anticipated to physically interfere with emergency response access, adopted emergency response plan or evacuation plan as most activities would be within the right-of-way. No road closures would be required for the proposed investigation activities. **No impacts** would occur in these regards.

- g) According to the California Department of Forestry and Fire Protection (CAL FIRE), Pools 17, 18, 20 and 21 are located within a Local Responsibility Area (LRAs) of Fresno and Kings Counties and are not designated as areas zoned for high fire severity (CAL FIRE 2020; 2007). The majority of investigation activities would occur within the right-of-way in paved/gravel areas and within existing maintained access roads, composed of compacted soils with no vegetation. The surrounding vegetation and active and idle agricultural land use types have a low potential for wildland fires. In addition, as a standard safety practice, all vehicles and equipment would have fire prevention equipment on-site, including fire extinguishers and shovels. Because the Proposed Project is not located within a very high fire hazard zone and not within or adjacent to uses prone to wildfires, the potential for wildfire impacts on people or structures due to Project implementation would be very low. **No impact** would occur.

### 3.3.10 Hydrology and Water Quality

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
i) result in substantial erosion or siltation on- or off-site;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iv) impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to Project inundation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

The Proposed Project area is within the South Valley Floor Watershed with Region 5 – Tulare Lake Hydrologic Basin (DWR 2020). Major cities in the Tulare Basin include Fresno, Bakersfield and Visalia. Major Geographic Features include Tulare Lake Basin, Kettleman Hills, Kings river, Kern river, Tule River, Tulare Lake, Kern Lake, and Buena Vista Lake. The Tulare Basin has mild winters and hot dry summers. Despite transient tule marsh areas, the area is predominantly dry and the valley summer heat is high. Less than five percent of the basin is urban in nature. The basin has been developed extensively for agriculture and petroleum extraction (USGS 2020a). The State Water

Resources Control Board (SWRCB) publishes updates to the Water Quality Control Plan for the Tulare Lake Basin (Basin Plan) to improve water quality and maintain beneficial uses in the drainage area of the San Joaquin Valley south of the San Joaquin River. The Basin Plan describes water quality concerns for the area that include agriculture, forestry, urban land uses, and stormwater runoff (RWQCB 2018).

- a) The Proposed Project would involve minimal disturbance and exposure of surface soils. As described previously, soils in the area consist of clay and sandy loams of different varieties which have a higher likelihood of eroding with more sand content. As such, exposed soils could increase erosion and sedimentation in surface runoff during wind or storm events. In addition, activities would involve use of chemicals and solvents such as fuel and lubricating grease for motorized heavy equipment, which could accidentally spill and subsequently impact stormwater quality. During Project implementation, there is potential for stormwater to transport sediment and/or hazardous materials to the SLC. For proposed drilling activities outside the SLC, no potential exists for stormwater to transport sediment and/or hazardous materials downstream to other receiving waters.

Erosion control BMPs would be used to prevent the degradation of water quality in the SLC. Examples of erosion control BMPs are installing a silt fence, creating a sediment/desilting basin, installing sediment traps, using fiber rolls, creating gravel bag berms, and creating sandbag or straw bale barriers. BMPs would also include practices for proper handling of chemicals, such as avoidance of fueling at the proposed geotechnical exploration sites and overtopping during fueling, and installation of containment pans. Further, implementation of the BMPs would begin with the commencement of the investigations and continue through the completion of the Project reduce intrusion of foreign materials into the SLC. Implementation of BMPs would avoid or reduce all erosion and sedimentation impacts to below a level of significance.

In addition, individual samples would be drilled to depths between 15 feet bgs and 100 feet bgs. The Proposed Project would therefore have the potential to encounter groundwater and interfere with groundwater quality. Samples would typically be completed in one working day, and would typically be filled within 24 hours of completion. For deeper samples that cannot be completed in one working day, DWR would require the contractor to cover the samples with a metal plate to secure the sample at the end of each workday. Further, sample activities would comply with Fresno/Kings County Environmental Health Department well permit requirements and DWR well completion standards so that surface waters and foreign materials are not allowed into the groundwater basin (See Section 2.3, *Proposed Action/Project Implementation*). As a result, impacts to groundwater quality would be **less than significant**.

- b) As described above in Question 3.3.10 (a) the Proposed Project would have the potential to encounter groundwater and interfere with groundwater during drilling activities. Any groundwater discharged during sampling could be recycled back into the sample site during drilling/auguring or stored in tanks on-site for eventual discharge into a nearby storm drain under a permit from the Regional Water Quality Control Board. The Proposed Project would not introduce new impervious surfaces or other facilities that would interfere or

impede groundwater recharge, nor would it require the use of groundwater during geotechnical investigation activities. As a result, the Proposed Project would not substantially decrease groundwater supplies or interfere with recharge in a way that would impede sustainable groundwater management of the basin. Therefore, impacts to groundwater recharge would be **less than significant**.

- c, i) The Proposed Project would not introduce impervious surfaces or structures that could substantially alter the existing drainage pattern of the Project site in a manner which would result in substantial erosion or siltation. Temporary earth-moving activities would slightly alter the topography of the Project area to facilitate the exploration activities. As discussed above in discussion (a), erosion control measures would be implemented to reduce the potential for stormwater-induced erosion or sedimentation offsite during Project activities. All sample sites would be backfilled and other disturbed areas would be restored to original grades once exploration activities are completed. Thus, the Proposed Project would not substantially alter the existing drainage pattern of the Project area in a way such that substantial erosion or siltation would occur on-site or off-site. Impacts would be **less than significant**.
- c, ii) As stated above in discussion (c)(i), the Proposed Project would not substantially alter the local drainage pattern of the site. The Proposed Project does not include the construction of permanent structures or impervious surfaces that would change the rate or amount of surface runoff from the Project site. As such, the Proposed Project would not result in flooding on-site or off-site. There would be **no impact**.
- c, iii) As mentioned in discussion (c)(ii), an increase in runoff would not occur as a result of the Project. As such, the Proposed Project would not contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems.  
  
As discussed above in response to (a), the Proposed Project would require implementation of BMPs for erosion control and for proper handling of chemicals. As such, the Proposed Project would not provide substantial additional sources of polluted runoff. Impacts would be **less than significant**.
- c,iv) No permanent facilities would be constructed as a result of geotechnical investigations, and the Proposed Project would not involve infrastructure or activities that could impede or redirect flows. **No impact** would occur.
- d) As stated above in (c)(iv), portions of the Proposed Project area are in a 100-year flood zone. As discussed above in the discussion for (a), BMPs would be implemented during the proposed geotechnical investigations to ensure proper handling of chemicals and avoid release of pollutants to the Project site. As such, impacts due to potential release of pollutants in a flood hazard area would be **less than significant**.

A seiche is a wave set up on a river, reservoir, pond, or lake when seismic waves from an earthquake pass through the area (USGS 2020b). The Proposed Project would take place immediately adjacent to and around the SLC; therefore, there would be no potential impacts associated with the risk of release of pollutants due to Project inundation from a seiche.

The Project area is located approximately 75 miles west from the nearest ocean, the Pacific, and therefore is not located within the tsunami risk zone. Therefore, the Proposed Project would not risk release of pollutants due to Project inundation from a tsunami.

- e) The Proposed Project would not involve pumping or extraction of groundwater. Once the geotechnical investigation activities are completed, operations of the Project area would not change. **No impact** to water quality control plans or sustainable groundwater management plans would occur.

### 3.3.11 Land Use/Planning

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

The proposed geotechnical investigation areas span between SLC MP 122.0 and MP 142.2 in Pools 17 and 18 and MP 155 and 171 in Pools 20 and 21. The SLC and majority of existing access roads are within the Reclamation and DWR right-of-way. Sample locations near bridge areas would be within County-jurisdiction, while borrow areas would either be within DWR’s jurisdiction, Reclamation jurisdiction, or private ownership within the county. Lands immediately surrounding the SLC are subject to Fresno and Kings Counties land use plans, policies, and regulations.

- a) Cantua Creek, Huron, Coalinga and Kettleman City are communities located within 5 miles of the Project area. The physical division of an established community generally refers to the construction of a feature such as an interstate highway or railroad tracks, or removal of a means of access, such as a local road or bridge that would impact mobility within an existing community or between a community and outlying area. Given that the Proposed Project would not construct any permanent, aboveground physical structures along or adjacent to the SLC, the Proposed Project would result in **no impact** to the physical division of an established community.
- b) The Project area is designated as Agricultural/Open Space and General Agriculture 40 ac and is zoned as Exclusive Agriculture (AE20) and AG40 (County of Fresno 2000; County of Fresno 2020; County of Kings 2020). The Proposed Project would not develop any permanent built facilities that would change the land use of the Project sites. As such, the Proposed Project would not conflict with the Fresno or Kings County General Plans, or Fresno or Kings County Zoning Codes. **No impact** would occur.

### 3.3.12 Mineral Resources

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

The Proposed Project sites are not included in Mineral Land Classification (MLC)/Surface Mining and Reclamation Act (SMARA) designated areas (California Department of Conservation 2020). Kings County and Fresno County planning documents do not identify mineral resources at the Proposed Project sites (Kings County 2010; Fresno County 2000).

- a) The Proposed Project geotechnical investigation sites are not included on any California Geologic Survey (CGS) maps or reports identifying potentially important mineral resources. Kings County and Fresno County planning documents do not identify any valuable mineral resources in the Project area. Additionally, proposed site preparation, sampling and site restoration associated with geotechnical investigations would occur within existing rights-of-way. Therefore, **no impact** would occur.
- b) Kings County and Fresno County planning documents do not delineate locally important mineral resources lands near the Proposed Project sites, and, as described in (a), proposed site preparation, sampling and site restoration associated with geotechnical investigations would occur within existing DWR, Caltrans, and Reclamation rights-of-way. Therefore, **no impact** to locally important mineral resources would occur.

### 3.3.13 Noise

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Sound is mechanical energy transmitted by pressure waves through a medium such as air. Noise is defined as unwanted sound. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). Sound pressure level is measured in decibels (dB), with zero dB corresponding roughly to the threshold of human hearing, and 120 to 140 dB corresponding to the threshold of pain.

### Applicable Noise Regulations

**Kings County.** The Kings County Code does not address construction or operation related noise. However, the Noise Element of the Kings County General Plan describes fixed noise sources within the County. The General Plan requires that site-specific noise analyses should be performed where noise-generating activities are proposed in proximity to noise-sensitive land uses. The Project would occur within the existing DWR right-of-way, with the exception of various locations in borrow areas and around bridge areas. Adjacent land uses include agricultural uses and open spaces. The County’s General Plan includes average and maximum noise level standards for various land uses. Average daytime noise level standards range from 55 to 60 dBA and maximum levels range from 75 to 80 dBA. Project construction would occur during daytime hours between 6:00 a.m. and 6:00 p.m. No residents or sensitive receptors are located near the Project area. The General Plan states the following:

*N Policy BI.1.3: Noise associated with construction activities shall be considered temporary, but will still be required to adhere to applicable County Noise Element standards.*

There are no relevant goals or policies that would be applicable to the Proposed Project (County of Kings 2003).

**Fresno County.** The Health and Safety Element of the Fresno County General Plan provides a Noise Section including goals, policies, and implementation programs applicable to noise. The General Plan sets noise standards for various land uses and protects noise-sensitive uses from excessive noise, either through noise-reducing Project design features or by allowing noise-sensitive land uses to only locate in areas with ambient noise levels below specific thresholds. The General Plan states the following regarding construction-related noise:

*Policy HS-G.6: The County shall regulate construction-related noise to reduce impacts on adjacent uses in accordance with the County's Noise Control Ordinance.*

The County Noise Control Ordinance includes maximum daytime exterior noise level standards that range from 50 dBA to 70 dBA. However, the Noise Code exempts the following activities that are applicable to the Proposed Project (Municode 2020):

*The following activities shall be exempted from the provisions of this chapter [Noise Control Ordinance]:*

- *Noise sources associated with construction, provided such activities do not take place before 6 a.m. or after 9 p.m.*
- *Noise sources associated with work performed by public utilities in the maintenance of modification of its facilities.*

The Fresno County General Plan does not contain any goals or policies that are applicable to the Proposed Project because the Project area is not considered a sensitive land use, nor is the Project area located near sensitive land uses (Fresno County 2000).

- a) Neither the Counties' codes nor the Counties' General Plans establish quantitative noise exposure standards that apply to construction activity. However, for the purposes of due diligence, resultant noise levels from simultaneous operations of all equipment were estimated, consistent with the general assessment methodology of the Federal Transit Administration (FTA 2018). Using the Federal Highway Administration's (FHWA) Roadway Construction Noise Model (RCNM) and conservatively assuming simultaneous operation of one or two drill rigs, one forklift, one water truck, one or two support trucks and five pickup trucks for site preparation, sample, and site restoration, it is estimated that the Project would result in noise levels of 83 dBA at a reference distance of 50 feet during construction (FHWA 2006). Accounting for distance attenuation, noise levels at 1,000 feet would be 57 dBA. As mentioned above, there are no sensitive receptors within 1,000 feet of the construction activity. Further, the closest sensitive receptors are Kettleman City residences located approximately 4,500 feet (0.8 mile) southeast of the southernmost geotechnical exploration site proposed in Pool 21. At this distance noise levels decrease to 44 dBA, and would be virtually imperceptible and indistinguishable from the local noise environment. Noise levels at all other sensitive receptors would be lower than 44 dBA and would be lower than Kings County's and Fresno County's noise standards of 55 dBA and 50 dBA, respectively. Additionally, all proposed investigation activities would occur between the allowable construction hours of 6:00 a.m. to 9:00 p.m. in Fresno County. Further, DWR and Reclamation as State and federal agencies are not subject to local ordinances. Therefore, the Proposed Project would not result in 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, impacts would be **less than significant**.

In addition, the Proposed Project would not include any permanent, long-term operational activities after the completion of proposed geotechnical exploration activities. Therefore, no impact to permanent ambient noise levels would occur during operation.

- b) Activities associated with site preparation, sampling, and site restoration have the potential to generate low levels of groundborne vibration due to the operation of equipment (i.e. drill rigs, water trucks, support trucks). This type of equipment is not identified by Caltrans (2013) or the Federal Transit Administration (FTA 2018) as associated with generation of notable vibration. No high-impact activities, such as pile driving or blasting, would be used during geotechnical exploration activities. As described above in the discussion for (a), Project activities would not take place near any residences or other noise-sensitive land uses that could be exposed to vibration levels generated from Project activities. Vibration attenuates rapidly with distance and would be imperceptible at the distances to the closest structures and sensitive receptors. Therefore, the Proposed Project would result in **less than significant** impacts.
- c) The Proposed Project would not establish new noise sensitive land uses that could be exposed to noise from local airports. The Project sites are located in a rural area that is distant from commercial or general aviation airports. The nearest public use airport is the New Coalinga Municipal Airport, located approximately 11 miles south of Pool 18. Therefore, there would be **no impact** in relation to airports and the Project exposing people residing or working in the Project area to excessive noise levels.

### 3.3.14 Population and Housing

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

According to the U.S. Census Bureau’s (Bureau) 2019 population estimates, Fresno County contains approximately 999,101 residents, while Kings County contains approximately 152,940 residents (Bureau 2020a; Bureau 2020b). Surrounding the Project area is extensive rural and agriculture areas. Based on the Bureau’s 2010 through 2019 estimates, Fresno and Kings Counties’ growth rates are 7.4 percent and zero percent, respectively. Most of the growth in Fresno County is from the city of Fresno, where nearly 60 percent of the population of the county is located (FCCG 2017), whereas Kings County has experienced much less growth and does not have a large city such as Fresno. As

of 2019, Fresno County contained 336,473 housing units with an owner-occupied housing unit rate of 52.8 percent, while Kings County contained 46,965 housing units with an owner-occupied housing unit rate of 52.3 percent (Bureau 2020a; Bureau 2020b).

- a) Proposed geotechnical investigation activities would not involve the construction of new homes, businesses, extensions of roads, or other infrastructure. The Proposed Project is anticipated to begin in the summer of 2021 for up to eight months and have a maximum of 10 workers for investigation activities. Contractors employed for investigation activities are expected to come from the existing labor pool within the region. The local workers would be involved with the Project temporarily for the approximately 8-month geotechnical investigation period. Implementation of the Proposed Project would not directly induce substantial population growth because the Project does not involve the construction of new homes, businesses, extensions of roads or other infrastructure.

Furthermore, the Proposed Project would not remove an obstacle to growth, such as constraint on a required public service, such as roads, water supply or wastewater treatment capacity. The Proposed Project is not a water supply Project and would not provide any resources to support or accommodate population growth. The Proposed Project would not indirectly induce population growth. Therefore, **no impact** would occur.

- b) There are no existing residences within the Project area that would be impacted by proposed geotechnical investigations. Further, no residences would be condemned or displaced by the Proposed Project. Therefore, the Proposed Project would not displace people or housing necessitating the construction of replacement housing elsewhere. Therefore, **no impact** would occur.

### 3.3.15 Public Services

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

The Fresno County Fire Protection District (FCFPD) serves all unincorporated areas of the County of Fresno. The FCFPD encompasses approximately 2,655 square miles and serves a population of more than 220,000 citizens (FCFPD 2020). The Fresno County Sheriff's Office (FCSO) provides law enforcement response to unincorporated territories of the County of Fresno. The FCSO patrols more than 6,000 square miles of Central California (FCSO 2020)

The Kings County Fire Department (KCFD) serves all unincorporated areas of the County of Kings. The KCFD encompasses approximately 1,392 square miles and serves a population of more than 153,000 citizens (KCFD 2020). The Kings County Sheriff's Office (KCSO) provides law enforcement response to unincorporated territories of the County of Kings (KCSO 2020).

The nearest school to the Project area is Cantua Elementary School, approximately 1 mile east of Pool 17. There are no parks or other public facilities such as libraries in close proximity to the Proposed Project area.

- a.i, ii) Geotechnical investigations would entail delivery of fuel and fueling/maintenance of drill rigs and other trucks, in addition to temporary storage of equipment and materials at nearby staging areas. In the event of a fire or other emergency within the Proposed Project area, existing fire protection and police services in Fresno and Kings Counties would be able to sufficiently respond to emergency events with existing equipment and staffing capacities. The Proposed Project would not change existing demand for fire or police protection services because geotechnical investigation activities would not result in a permanent increase of employees or population to the Project area. Therefore, implementation of the Proposed Project would not require new fire or police facilities to maintain response ratios, service ratios, or other measures of performance. **No impacts** would occur.
- a.iii) The Proposed Project would not result in an increase in population. As a result, the Proposed Project would not lead to the construction of new housing, which could prompt a need for additional school services. Therefore, the Proposed Project would have **no impact** related to school services.
- a.iv) The Proposed Project would not result in an increase in population, and would not prompt the need for new parks. Therefore, the Proposed Project would have **no impact** related to parks.
- a.v) The Proposed Project would not include new housing or bring new businesses to the area that would require any additional services or public facilities, including libraries. Therefore, the Proposed Project would have **no impact** related to other public facilities.

### 3.3.16 Recreation

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a) Would the Project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

There are no existing neighborhood or regional parks or other recreational facilities in close proximity to the Proposed Project area. DWR does however, allow recreational fishing along segments of the SLC.

- a, b) Three designated fishing access sites would be temporarily closed during geotechnical investigations along the SLC, including the Three Rocks Site within the Pool 17 embankment, the Avenal Cutoff Site within the Pool 20 embankment, and the Kettleman City site within the Pool 21 embankment (DWR 2020). It is anticipated that recreational fishing within these portions of the SLC would not be available for the 8-month duration of the Proposed Project. However, the closures would be temporary in nature and the Proposed Project would not result in permanent increases to population that would have an adverse physical effect on the environment. Further, other DWR recreational fishing sites along the SLC have adequate capacity to serve a temporary influx of recreational visitors that would be redirected from interrupted sites. Thus, the Proposed Project would not increase the need to construct or expand recreational facilities. Therefore, **no impacts** would occur.

### 3.3.17 Transportation

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Would the Project conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Regional access to the Project area would be via I-5. Local access to the Proposed Project sites would occur from existing access roads or proposed temporary access roads, which are accessible from surrounding county roadways. To reach access roads along Pool 17, construction traffic would use nearby county roads and highways, such as SR-33, West Clarkson Avenue, West Kamm Avenue, West Mount Whitney Avenue, and/or unpaved agricultural roads. To access roads along Pool 18, construction traffic would use SR-145 and/or unpaved agricultural roads. Access roads along Pool 20 would be reached by construction vehicles using West Jayne Avenue, Avenal Cutoff Road, and/or unpaved agricultural roads. Similarly, Avenal Cutoff Road would be used to access roads along Pool 21, in addition to Plymouth Avenue, 30<sup>th</sup> Avenue, Quail Avenue, and/or unpaved agricultural roads. Construction equipment would be offloaded on-site to remain within the staging areas for the duration of the Project, and would be mobilized to each sample or drilling location.

- a) Implementation of the Proposed Project could temporarily increase the number of vehicles on local roadways due to the transport and delivery of equipment, daily worker commute trips over an 8-month period, soil/testing material trips, and site restoration trips. All equipment and materials would be transported to the Proposed Project sites on public highways, local roads, and private driveways, using standard transport vehicles.

The delivery of vehicles and equipment to the sites is only expected to occur when the equipment is delivered to/from the sites (two one-way trips for all equipment). The majority of traffic impacts would occur from the daily arrival and departure of workers that would commute individually to the active site. An average of approximately 10 workers would be required at the site per day over an eight-month period. The addition of an average of 10 worker round trips (20 one-way trips) along local roads would not substantially affect the circulation capacity, and therefore, the trips would not substantially affect the capacity of the local roadways. Further, the Proposed Project would not conflict with adopted policies, plans, or programs related to public transit or alternative modes of transportation. The Project would not decrease the performance or safety of these facilities, which are sparse within the largely rural Project area. Project activities would not disrupt services along local public transit, bicycle, or pedestrian routes. **No impact** would occur.

- b) “Vehicle miles traveled” refers to the amount and distance of automobile travel attributed to a Project. A maximum of 10 workers would be required during various Proposed Project activities. These trips would be temporary over the approximately eight-month geotechnical investigation period and would not result in any perceivable increase in vehicle miles traveled

that would exceed a County threshold of significance. There are no new permanent vehicle trips associated with the Proposed Project other than routine maintenance. As a result, the Proposed Project would be consistent with CEQA Guidelines Section 15064.3 subdivision (b), and **no impact** would occur.

- c) The Proposed Project does not include the construction or design of any permanent roadway infrastructure that would cause a safety risk to vehicle operations. The Proposed Project would not adversely alter the physical configuration of the existing roadway network serving the area and would not introduce unsafe design features associated with large equipment transport. In addition, the Proposed Project would not introduce uses (types of vehicles) that are incompatible with existing uses already served by the area’s road system. There would be **no impact**.
- d) The Proposed Project would temporarily add vehicles to the local roadway and circulation system. However, no lane or road closures would be required. All Project-related activities would occur on-site. The Proposed Project would not interfere with emergency response access and there would be **no impact** to long-term emergency access.

### 3.3.18 Tribal Cultural Resources

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

The analysis in this section is based, in part, on the results of SLF searches conducted by the NAHC and tribal outreach conducted by DWR pursuant to Assembly Bill 52 (AB 52), the California Natural Resources Agency's *Final Tribal Consultation Policy*, and DWR's *Tribal Engagement Policy*, and consultation conducted by Reclamation under Section 106 of the NHPA...

### **Sacred Lands File Search**

The NAHC was contacted on October 23, 2020 to request searches of the SLF. The NAHC responded to the requests in letters dated November 9, 2020. The results of the SLF search conducted by the NAHC returned negative results for the Proposed Project area. The NAHC reply also included a list of California Native American tribes who may have knowledge of cultural resources in the Proposed Project area.

### **Native American Outreach/Consultation**

Pursuant to AB 52, DWR sent a notification letter to Leo Sisco, Chairperson of the Santa Rosa Rancheria Tachi Yokut Tribe on December 21, 2020. The letter included a description of the Proposed Project, provided figures depicting the Proposed Project location, and invited the Santa Rosa Rancheria Tachi Yokut Tribe to consult on the Proposed Project. The letter also indicated that if AB 52 consultation was not requested, DWR was still committed to working together with the tribe consistent with the California Natural Resources Agency's Tribal Engagement Policy and DWR's Tribal Engagement Policy. In addition, pursuant to DWR's Tribal Engagement Policy, DWR reached out to an additional 16 individuals representing 13 distinct tribal organizations listed on the NAHC contact list. Letters were sent via mail and email. In January 2021 and March 2021, follow-up correspondence consisting of subsequent emails and phone calls was conducted with non-Yokut tribes who did not respond to the initial letter. DWR's tribal outreach efforts and the results of consultation are summarized in **Table 7**.

Pursuant to the regulations at 36 CFR § 800.3(f)(2), Reclamation identified the Big Sandy Rancheria of Western Mono Indians, the Chicken Ranch Rancheria, the Cold Springs Rancheria of Mono Indians, the Picayune Rancheria of Chukchansi Indians, the Santa Rosa Rancheria Tachi Yokut Tribe, the Table Mountain Rancheria, and the Tule River Indian Tribe as Indian tribes who might attach religious and cultural significance to historic properties within the APE. Reclamation contacted these tribes regarding the Federal undertaking on June 14, 2021, inviting their assistance in identifying historic properties that may be affected by the proposed undertaking, pursuant to 36 CFR § 800.4(a)(4). Reclamation also sent a letter to the Amah Mutsun Tribal Band, the Dumna Wo-Wah Tribal Government, the Dunlap Band of Mono Indians, the Kings River Choinumni Farm Tribe, the Nashville-El Dorado Miwok, the North Fork Mono Tribe, the Traditional Choinumni Tribe, and the Wuksache Indian Tribe, Eshom Valley Band, who were identified as Native American individuals or organizations likely to have knowledge or concerns with cultural resources in the area. We contacted these organizations regarding our Federal undertaking to request their assistance in identifying historic properties of concern in the APE pursuant to 36 CFR § 800.4(a)(3). To date, no responses have been received and no historic properties have been identified through consultation with these tribes and Native American organizations.

Table 7 Summary of DWR's Native American Consultation

Tribe	Contact Name	Contact Title	Date Letter Sent	Date Email Sent	Date of Follow-Up Email	Date of Follow-Up Phone Call	Response
Big Sandy Rancheria of Western Mono Indians	Elizabeth D. Kipp	Chairperson	12/21/2020	12/21/2020	3/16/2021	3/10/2021	None
Chicken Ranch Rancheria of Me-Wuk Indians	Lloyd Mathiesen	Chairperson	12/21/2020	12/21/2020	N/A	3/10/2021	Project is out of tribe's area; defers to local tribes
Cold Springs Rancheria	Helena Alarcon	Chairperson	12/21/2020	12/21/2020	3/16/2021	3/10/2021	None
Dumna Wo-Wah Tribal Government	Robert Ledger Sr.	Chairperson	12/21/2020	12/21/2020	1/12/2021	1/19/2021 and 03/10/21	Dumna has no comments at this time
Dunlap Band of Mono Indians	Benjamin Charley Jr	Chairperson	12/21/2020	12/21/2020	1/12/2021	N/A	Project is out of tribe's area
Dunlap Band of Mono Indians	Dirk Charley	Tribal Secretary	12/21/2020	12/21/2020	1/12/2021	N/A	Project is out of tribe's area
Kings River Choinumni Farm Tribe	Stan Alec	N/A	12/21/2020	No email address	No email address	1/19/2021 and 03/10/21	None
Nashville Enterprise Miwok-Maidu-Nishinam Tribe	Cosme A. Valdez	Chairperson	12/21/2020	12/21/2020	3/16/2021	3/10/2021	None
North Fork Mono Tribe	Ron Goode	Chairperson	12/21/2020	12/21/2020	3/16/2021	3/10/2021	None
Picayune Rancheria of Chukchansi Indians	Claudia Gonzales	Chairperson	12/21/2020	12/21/2020	N/A	N/A	None

Tribe	Contact Name	Contact Title	Date Letter Sent	Date Email Sent	Date of Follow-Up Email	Date of Follow-Up Phone Call	Response
*Santa Rosa Rancheria Tachi Yokut Tribe	Leo Sisco	Chairperson	12/21/2020	12/21/2020	1/12/2021	1/22/2021	None
Table Mountain Rancheria	Bob Pennell	Cultural Resources Director	12/21/2020	12/21/2020	N/A	N/A	None
Table Mountain Rancheria	Brenda D. Lavell	Chairperson	12/21/2020	12/21/2020	N/A	N/A	None
Traditional Choinumni Tribe	Rick Osborne	Cultural Resources	12/21/2020	12/21/2020	1/12/2021	1/19/2021	Project is out of tribe's area; requested notification of cultural discoveries
Traditional Choinumni Tribe	David Alvarez	Chairperson	12/21/2020	12/21/2020	1/12/2021	See Osborne	Project is out of tribe's area; requested notification of cultural discoveries
Tule River Indian Tribe	Neil Peyron	Chairperson	12/21/2020	12/21/2020	N/A	N/A	None
Wuksache Indian Tribe/Eshom Valley Band	Kenneth Woodrow	Chairperson	12/21/2020	12/21/2020	3/16/2021	3/10/2021	None

\*denotes tribe contacted pursuant to AB 52 (PRC Section 21080.3)

### Summary of Identified Tribal Cultural Resources

Through background research, Native American consultation and correspondence, and field surveys conducted for the Proposed Project, no tribal cultural resources, including any indigenous archaeological resources that may be considered tribal cultural resources, were identified in the Proposed Project area. The two previously recorded indigenous archaeological resources (P-10-006343, JPB-ISO-2) were not re-located during field surveys, and no other indigenous archaeological resources were identified in the Proposed Project area as a result of research or field surveys.

a.i, a.ii) No tribal cultural resources, as defined in PRC Section 21074, have been identified in or near the Proposed Project area. However, since the entirety of the Proposed Project area could not be surveyed due to lack of landowner permission to access some areas (approximately 12 percent of the Proposed Project area) and since the Project includes ground-disturbing activities, there remains the potential that indigenous archaeological resources could be encountered, including those that meet the definition of tribal cultural resource. If encountered, tribal cultural resources may be eligible for listing in the California Register or in a local register as defined in PRC Section 5020.1(k), or may be 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 PRC Section 5024.1. Effects/impacts would be significant if Proposed Project activities cause a substantial adverse change in the significance of a tribal cultural resource. **Mitigation Measures CUL-1, CUL-2, CUL-3, and CUL-4** require worker training, pre-construction surveys, avoidance of resources, and treatment of inadvertent discoveries. Therefore, impacts to tribal cultural resources would be **less than significant impact with mitigation incorporated**.

### 3.3.19 Utilities and Service Systems

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry and multiple dry years?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

The Westlands Water District is the nearest water supplier in the vicinity of the Project area. The district is made up of more than 1,000 square miles of prime farmland in western Fresno and Kings Counties, and serves CVP water to farms through 1,034 miles of underground pipe and more than 2,924 water meters (Westlands Water District 2020). Other local water districts provide municipal water to surrounding areas via pump stations, pipelines, and other water storage and conveyance facilities.

Solid waste that is generated by proposed activities along Pools 17 and 18 would likely be sent to American Avenue Disposal Site, and solid waste that is generated by the proposed activities along Pools 20 and 21 would likely be sent to the Avenal Regional Landfill. Both facilities offer disposal services for construction/demolition wastes, industrial wastes, agricultural wastes, and other waste types that may be generated by the Proposed Project. According to most recent updates, these landfills have remaining capacities of 29,358,535 cubic yards and 30,300,000 cubic yards, respectively (CalRecycle 2020a; 2020b).

- a) The Proposed Project would involve the employment of approximately 10 workers throughout the approximately eight-month geotechnical investigation schedule. The Proposed Project may require limited use of potable water during geotechnical investigation activities. Water required for rotary wash samples and cement backfilling would be obtained from a support truck. The amount of water used depends on the sample depth but could range from approximately 65 to 70 gallons. No water or wastewater treatment facilities would be installed as part of the Proposed Project. No improvements are planned to support geotechnical exploration activities that require new electric power, natural gas, or telecommunication facilities.

The Proposed Project would not alter the local drainage pattern of the Project sites. The Proposed Project does not include the construction of permanent structures or impervious surfaces that would alter or change the rate or amount of surface runoff from the Project sites. Therefore, the Proposed Project would not require the construction or expansion of new storm water drainage facilities. There would be no construction of utility infrastructure associated with the Proposed Project; there would be **no impact**.

- b) The Proposed Project is limited to geotechnical investigations and does not involve the implementation of structures requiring water service. Geotechnical investigations would not

create dust in quantities that would generate the need for dust suppression through the application of water. Therefore, there would be **no impact**.

- c) The Proposed Project would result in the generation of wastewater associated with temporary use of portable toilets. During Project implementation, DWR or the contractor may have portable toilet facilities available on-site temporarily for use by workers. Given the relatively small workforce of up to a maximum of 10 workers on-site daily for the 8-month geotechnical investigation period, this amount of waste would be minimal. Once exploration activities are concluded, such portable facilities would be removed and the wastewater properly handled and disposed in accordance with all applicable laws and regulations. Therefore, the Proposed Project does not require a wastewater treatment provider to serve the Project. **No impact** would occur.
- d) Implementation of the Proposed Project would result in nominal solid waste, limited to trash and other Project-related materials. Because the Proposed Project would not demolish existing facilities on-site or require building materials or infrastructure, there would be no construction debris to be disposed of or transported. During exploration activities, soil to be tested would be stored in appropriate bags, and core boxes within a secured container on-site in an undisturbed area. Once each exploration activity is completed, soil cuttings generated by drilling methods would either be disposed of at local landfills or spread on the surface to match preexisting conditions.

As described above, nearby disposal facilities have adequate capacities to service waste generated by the Proposed Project. Therefore, the Proposed Project would result in a **less-than-significant impact** related to local infrastructure capacity and would not impair attainment of solid waste reduction goals.

- e) Implementation of the Proposed Project would result in nominal solid waste. Statewide policies regarding solid waste have become progressively more stringent, reflecting AB 939, which requires local government to develop waste reduction and recycling policies and meet mandated solid waste reduction targets. The Proposed Project would collect approximately 250 cubic feet of soil for testing. Soil samples would be tested and discarded appropriately by the laboratory facility in accordance with applicable state and federal laws. Impacts would be **less than significant**.

### 3.3.20 Wildfire

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a) If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Project:  Substantially impair an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

The Project area is located within an LRA designated as unzoned by CAL FIRE (CAL FIRE 2020; 2007).

- a) Implementation of the Proposed Project is not anticipated to substantially impair an adopted emergency response plan or evacuation plan because the majority of samples would take place within the boundaries of the SLC right-of-way, or within an area outside of county roadways. Implementation of the Proposed Project would not interfere with emergency response access to the Project vicinity and **no impact** would occur.
- b) The Project area does not include slopes that surround the SLC that are susceptible to prevailing winds. Further, the surrounding vegetation and land use types have a low potential for fires. As a standard DWR safety practice, all vehicles and equipment would have fire prevention equipment on-site, including fire extinguishers and shovels. Therefore, geotechnical investigation activities proposed under the Project are not expected to expose Project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire. Further, the Project does not involve operation of facilities that would exacerbate fire conditions within the area or require permanent workers or occupants at the sample sites. As a result, **no impact** would occur.
- c) The Proposed Project includes geotechnical investigations and soil sampling. The Proposed Project would not require the installation or maintenance of infrastructure that would exacerbate wildfire risks. Therefore, there would be **no impact**.
- d) As discussed in Section 3.3.7, *Geology and Soils*, Questions (a)(iv) and (c), and Section 3.3.10, *Hydrology and Water Quality*, discussions (c)(i) and (c)(ii) above, the Project would not result in increased drainage or runoff that could contribute to landslide or flooding impacts. **No impact** would occur.

### 3.3.21 CEQA Mandatory Findings of Significance

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a) Does the Project have the potential to 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, 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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Does the Project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- a) The Proposed Project would be temporary in nature and involve sample activities within and around the SLC Pools 17, 18, 20 and 21. The Proposed Project would not: 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; reduce or restrict the range of rare or endangered plants or animals; or, eliminate important examples of the major periods of California history or prehistory. As discussed in the analyses provided in this Initial Study, adherence to federal, State, and local regulations, and proposed **Environmental Commitments/Mitigation Measures in Section 2.3.1** would reduce all potentially significant impacts to biological, cultural, GHG, energy, and geological resources as well as to other issue areas analyzed, to **less-than-significant levels with mitigation incorporated**.
- b) As noted throughout this document, the potential impacts of the Proposed Project are primarily temporary and short-term impacts and are site-specific. As noted above, all of the potential direct and indirect impacts of the Proposed Project were determined to be fully avoided or reduced to less than significant with incorporation of **Environmental Commitments/Mitigation Measures in Section 2.3.1**. As a result, the potential impacts of the Proposed Project are not considered cumulatively considerable, and impacts would be **less than significant with mitigation incorporated**.

- c) The potential impacts of the Proposed Project are temporary, short-term, and site-specific. These impacts are all localized to the Proposed Project area and include limited adverse effects on biological, cultural, GHG, energy and geological resources. However, the Proposed Project would not include any activities or uses that may cause substantial adverse effects on human beings, either directly or indirectly, or on the physical environment. Compliance with applicable local, State, and federal standards, as well as incorporation of Project mitigation measures, would result in **less-than-significant impacts with mitigation incorporated.**

## 4 Consultation and Coordination

### 4.1 Agencies and Persons Consulted

Reclamation and DWR consulted or coordinated with the following in the preparation of this EA/IS-MND:

- Big Sandy Rancheria of Western Mono Indians
- Chicken Ranch Rancheria
- Cold Springs Rancheria of Mono Indians
- Picayune Rancheria of Chukchansi Indians
- Santa Rosa Rancheria Tachi Yokut Tribe
- Table Mountain Rancheria
- Tule River Indian Tribe
- Amah Mutsun Tribal Band
- Dumna Wo-Wah Tribal Government
- Dunlap Band of Mono Indians
- Kings River Choinumni Farm Tribe
- Nashville-El Dorado Miwok
- North Fork Mono Tribe
- Traditional Choinumni Tribe
- Wuksache Indian Tribe, Eshom Valley Band
- State Historic Preservation Officer
- Westlands Water District
- California Department of Fish and Wildlife

### 4.2 Public Involvement

Reclamation and DWR intend to provide the public with an opportunity to comment on the Draft EA/IS-MND during a 30-day public review period.

### **4.3 Title 54 U.S.C. § 306108, Commonly Known as Section 106 of the National Historic Preservation Act**

Title 54 U.S.C. § 306108, commonly known as Section 106 of the NHPA (formerly 16 U.S.C. 470 et seq.), requires Federal agencies to consider the effects of their undertakings on historic properties, properties determined eligible for inclusion in the National Register, and to afford the Advisory Council on Historic Preservation an opportunity to comment. Compliance with Section 106 follows a series of steps, identified in its implementing regulations found at 36 CFR Part 800, that include identifying consulting and interested parties, identifying historic properties within the area of potential effect, and assessing effects on any identified historic properties, through consultations with the SHPO, Indian tribes and other consulting parties.

Reclamation will submit and seek concurrence from the State Historic Preservation Officer (SHPO) prior to approval of the Final EA/IS-MND.

## **5 Preparers and Reviewers**

### **5.1 Bureau of Reclamation**

Rain L. Emerson, Environmental Compliance Branch Chief, SCCAO  
Shauna A. McDonald, Wildlife Biologist, SCCAO  
Melissa M. Ivie, Regional Cultural Resources Officer, CGB-153  
Kirk J. Schmitz, Archaeologist, CGB-153  
David E. Hyatt, Resources Management Division Chief, SCCAO – reviewer

### **5.2 California Department of Water Resources**

Marea McCann, Environmental Scientist, Division of Engineering – Environmental Project Manager  
Nicole Darby, Program Manager II, Division of Engineering – California Aqueduct Subsidence Program - Environmental Program Manager  
Angela Calderaro, Environmental Program Manager, Environmental Coordination Section, Division of Engineering  
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### **5.3 Environmental Science Associates**

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Katelyn Matroni, Deputy Project Manager  
Andray Cardoza, Planner  
Barbra Calantas, Biologist  
Candace Ehringer, Archeologist  
Breanna Sewell, Air Quality Analyst  
Tim Witwer, Noise Analyst

# Appendix A

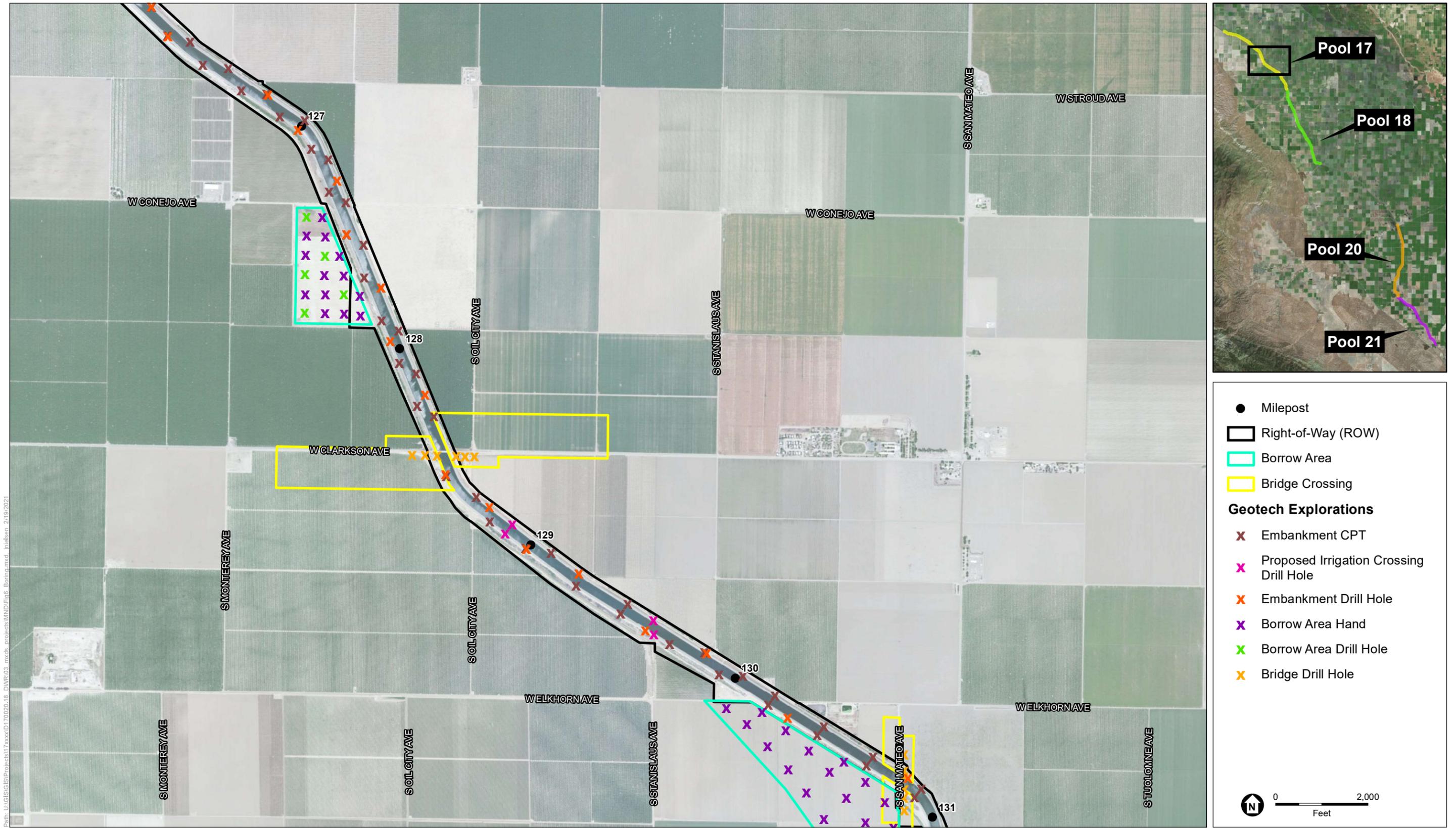
## **Figures**



SOURCE: ESA, 2021.

San Luis Canal Geotechnical Investigations Project

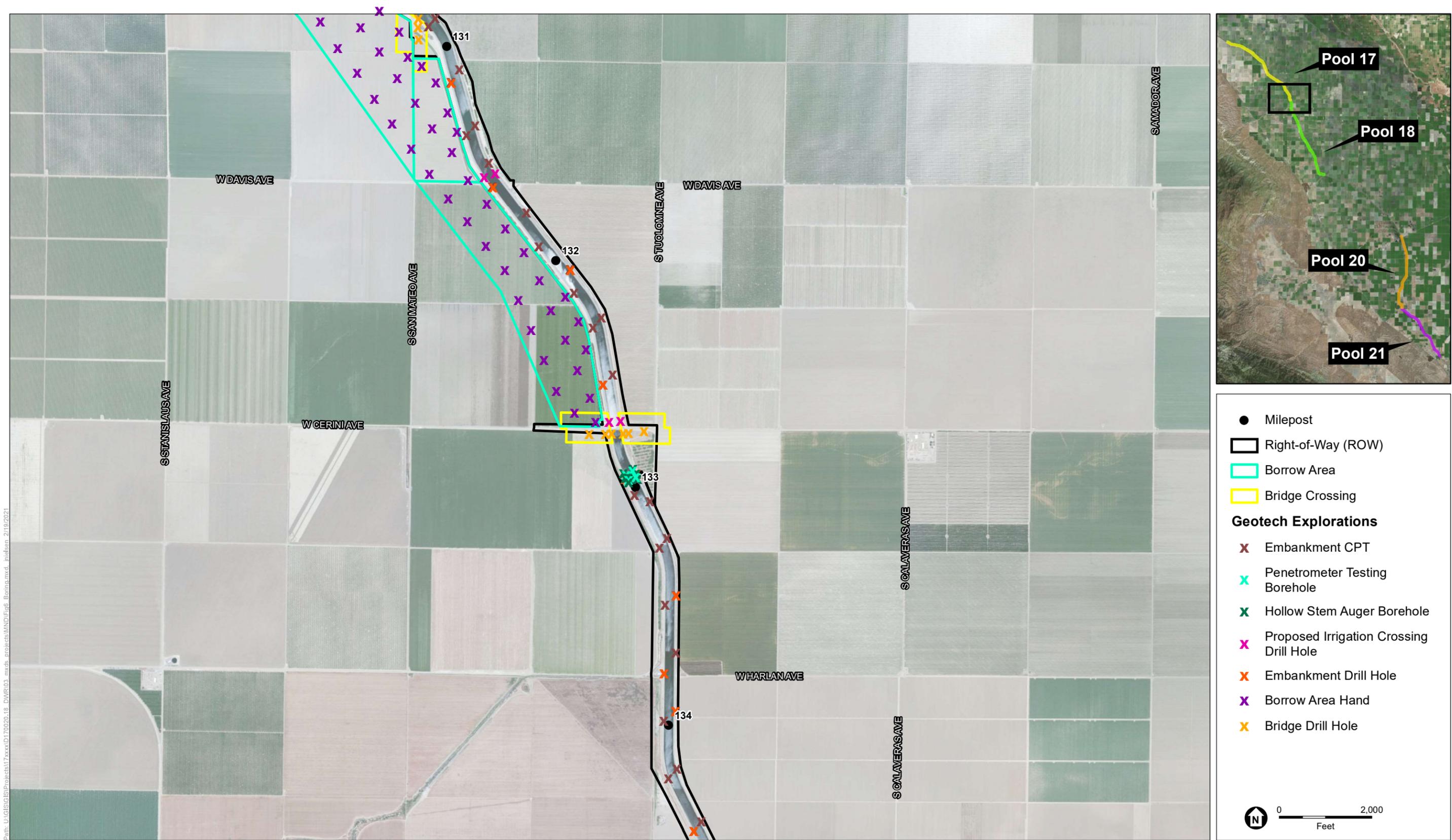
**Figure 2**  
Geotechnical Exploratory Boring Locations



SOURCE: ESA, 2021.

San Luis Canal Geotechnical Investigations Project

**Figure 3**  
Geotechnical Exploratory Boring Locations



SOURCE: ESA, 2021.

San Luis Canal Geotechnical Investigations Project

**Figure 4**  
 Geotechnical Exploratory Boring Locations



SOURCE: ESA, 2021.

San Luis Canal Geotechnical Investigations Project

**Figure 5**  
Geotechnical Exploratory Boring Locations

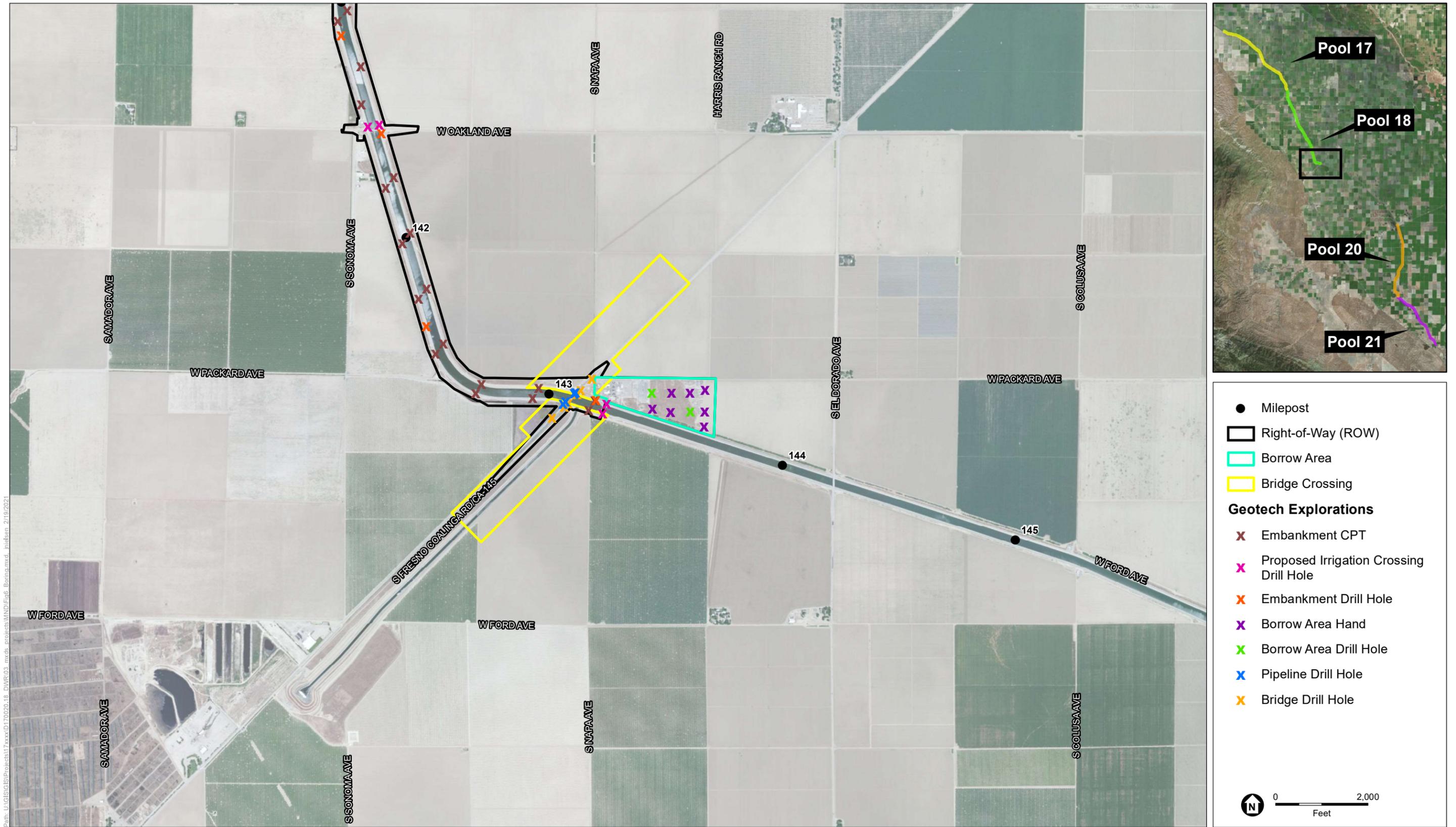




SOURCE: ESA, 2021.

San Luis Canal Geotechnical Investigations Project

**Figure 6**  
Geotechnical Exploratory Boring Locations



SOURCE: ESA, 2021.

San Luis Canal Geotechnical Investigations Project

**Figure 7**  
Geotechnical Exploratory Boring Locations



SOURCE: ESA, 2021.

San Luis Canal Geotechnical Investigations Project

**Figure 8**  
Geotechnical Exploratory Boring Locations

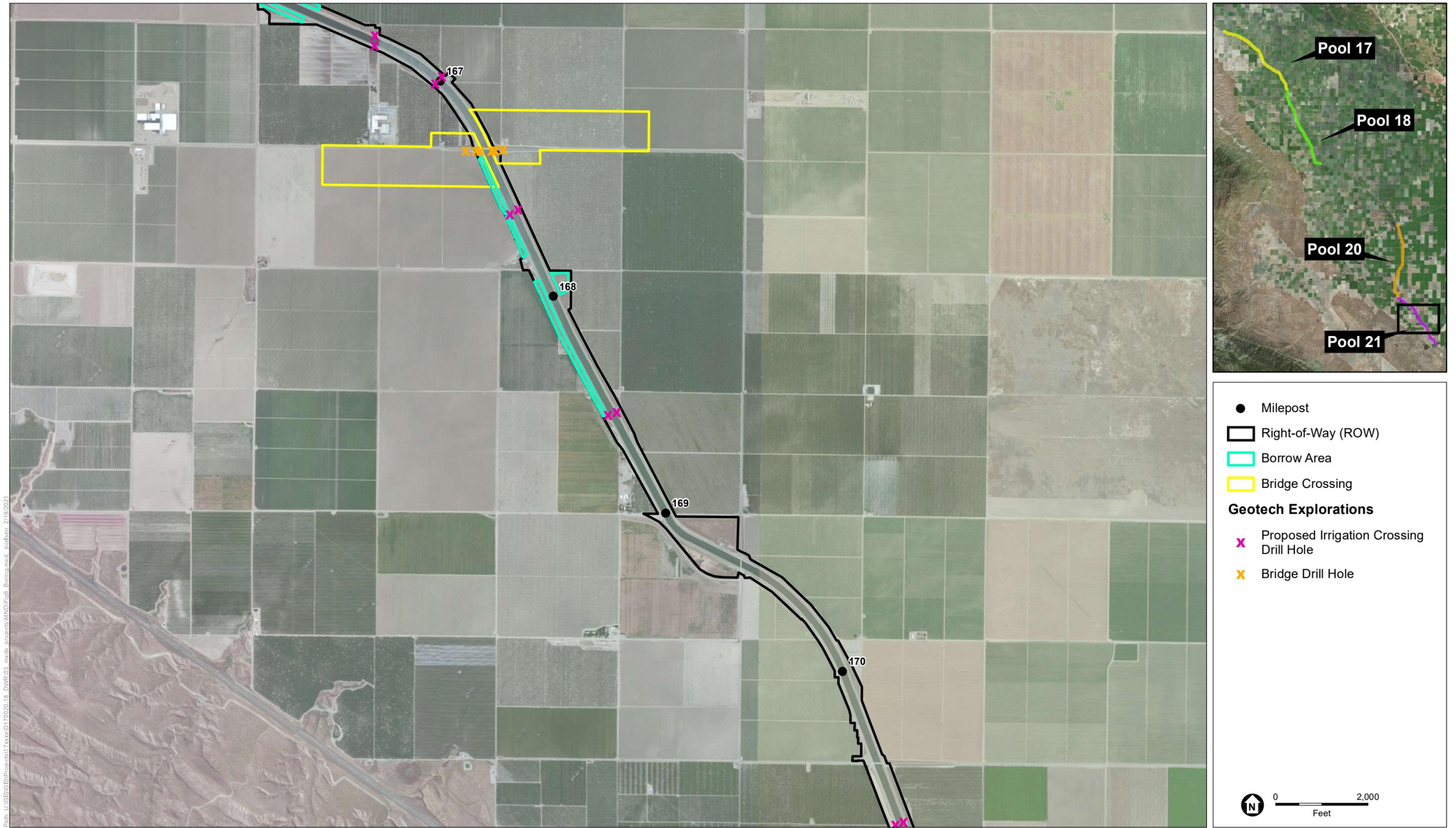


SOURCE: ESA, 2021.

San Luis Canal Geotechnical Investigations Project

**Figure 9**  
Geotechnical Exploratory Boring Locations



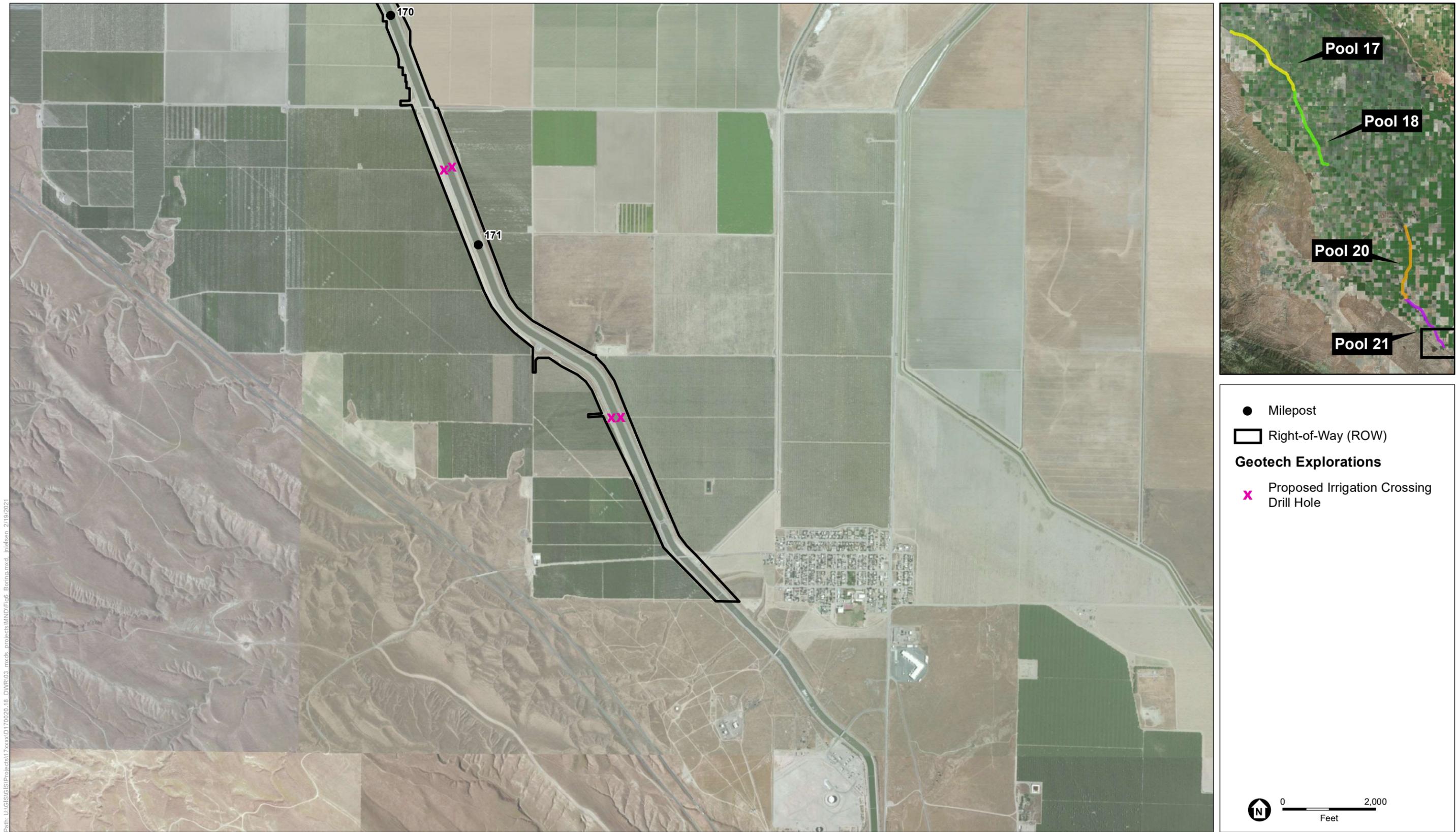


Path: U:\GIS\GIS\Projects\17xxxx\170020\_18\_DWR\03\_mxd\arjels\170020\_18\_DWR\03\_mxd\arjels\MND\Fig6\_Burnip.mxd, InitDate: 2/19/2021

SOURCE: ESA, 2021.

San Luis Canal Geotechnical Investigations Project

**Figure 11**  
Geotechnical Exploratory Boring Locations



SOURCE: ESA, 2021.

San Luis Canal Geotechnical Investigations Project

**Figure 12**  
 Geotechnical Exploratory Boring Locations

# Appendix B

## **Air Emissions Calculations Output / Greenhouse Gas Emissions Reduction Plan**

Appendix B-1  
**Air Emissions Calculations  
Output**

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Kings County, Annual**

**1.0 Project Characteristics**

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**1.1 Land Usage**

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Golf Course	4.13	Acre	4.13	179,902.80	0

**1.2 Other Project Characteristics**

<b>Urbanization</b>	Rural	<b>Wind Speed (m/s)</b>	2.2	<b>Precipitation Freq (Days)</b>	37
<b>Climate Zone</b>	3			<b>Operational Year</b>	2022
<b>Utility Company</b>	Pacific Gas & Electric Company				
<b>CO2 Intensity (lb/MW hr)</b>	283.4	<b>CH4 Intensity (lb/MW hr)</b>	0.029	<b>N2O Intensity (lb/MW hr)</b>	0.006

**1.3 User Entered Comments & Non-Default Data**

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Project Characteristics - projected EF based on RPS and historical EFs

Land Use - 600 boring sites x 300 sq ft per boring work pad = 180,000 sq ft = 4.13 acre

Construction Phase - Anticipated 6-month timeline, beginning in summer of 2021

Off-road Equipment - no arch. coating phase

Off-road Equipment - no equipment needed - just truck trips

Off-road Equipment - provided by DWR

Off-road Equipment - no equipment - truck trips only

Off-road Equipment - no paving phase

Off-road Equipment - creation of gravel access roads

Trips and VMT - max 10 workers on-site per day; drill work vendor trips = water trucks; mob/demob vendor trips = equipment delivery; assume 10 CY capacity per haul truck; materials from West Sac

Grading -

Vehicle Trips - no operational component

Construction Off-road Equipment Mitigation -

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tblConstructionPhase	NumDays	8.00	128.00
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## 2.0 Emissions Summary

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Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	6-1-2021	8-31-2021	1.9507	1.9507
2	9-1-2021	11-30-2021	1.9885	1.9885
3	12-1-2021	2-28-2022	0.0010	0.0010
		Highest	1.9885	1.9885

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	1.7000e-003	0.0000	4.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	7.0000e-005	7.0000e-005	0.0000	0.0000	8.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.5724	0.0000	0.5724	0.0338	0.0000	1.4182
Water						0.0000	0.0000		0.0000	0.0000	0.0000	1.6243	1.6243	1.7000e-004	3.0000e-005	1.6387
<b>Total</b>	<b>1.7000e-003</b>	<b>0.0000</b>	<b>4.0000e-005</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.5724</b>	<b>1.6244</b>	<b>2.1968</b>	<b>0.0340</b>	<b>3.0000e-005</b>	<b>3.0570</b>

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**2.2 Overall Operational**

**Mitigated Operational**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.7000e-003	0.0000	4.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	7.0000e-005	7.0000e-005	0.0000	0.0000	8.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.5724	0.0000	0.5724	0.0338	0.0000	1.4182
Water						0.0000	0.0000		0.0000	0.0000	0.0000	1.6243	1.6243	1.7000e-004	3.0000e-005	1.6387
<b>Total</b>	<b>1.7000e-003</b>	<b>0.0000</b>	<b>4.0000e-005</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.5724</b>	<b>1.6244</b>	<b>2.1968</b>	<b>0.0340</b>	<b>3.0000e-005</b>	<b>3.0570</b>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	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**

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Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Site Preparation	6/1/2021	6/1/2021	5	1	
2	Site Prep	Site Preparation	6/2/2021	6/3/2021	5	2	
3	Drill Work	Grading	6/4/2021	11/30/2021	5	128	
4	Demobilization	Site Preparation	12/1/2021	12/1/2021	5	1	
5	Paving	Paving	6/3/2022	6/2/2022	5	0	
6	Architectural Coating	Architectural Coating	6/29/2022	6/28/2022	5	0	

**Acres of Grading (Site Preparation Phase): 0**

**Acres of Grading (Grading Phase): 0**

**Acres of Paving: 0**

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

**OffRoad Equipment**

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Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Concrete/Industrial Saws	0	8.00	81	0.73
Mobilization	Excavators	0	8.00	158	0.38
Mobilization	Rubber Tired Dozers	0	8.00	247	0.40
Mobilization	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Site Prep	Excavators	0	8.00	158	0.38
Site Prep	Graders	0	8.00	187	0.41
Site Prep	Rubber Tired Dozers	0	8.00	247	0.40
Site Prep	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Drill Work	Bore/Drill Rigs	2	10.00	221	0.50
Drill Work	Cranes	0		231	0.29
Drill Work	Excavators	0	8.00	158	0.38
Drill Work	Forklifts	1	4.00	89	0.20
Drill Work	Generator Sets	0		84	0.74
Drill Work	Graders	0	8.00	187	0.41
Drill Work	Off-Highway Trucks	7	10.00	402	0.38
Drill Work	Rubber Tired Dozers	0	8.00	247	0.40
Demobilization	Excavators	0	8.00	158	0.38
Demobilization	Graders	0	8.00	187	0.41
Demobilization	Rubber Tired Dozers	0	8.00	247	0.40
Demobilization	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Paving	Cement and Mortar Mixers	0	6.00	9	0.56
Paving	Pavers	0	8.00	130	0.42
Paving	Paving Equipment	0	6.00	132	0.36
Paving	Rollers	0	6.00	80	0.38
Paving	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Architectural Coating	Air Compressors	0	6.00	78	0.48





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**3.2 Mobilization - 2021**

**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.0000e-005	1.2700e-003	2.5000e-004	0.0000	7.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.3007	0.3007	4.0000e-005	0.0000	0.3016
Worker	8.0000e-005	7.0000e-005	6.1000e-004	0.0000	1.9000e-004	0.0000	1.9000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.1504	0.1504	0.0000	0.0000	0.1505
<b>Total</b>	<b>1.2000e-004</b>	<b>1.3400e-003</b>	<b>8.6000e-004</b>	<b>0.0000</b>	<b>2.6000e-004</b>	<b>0.0000</b>	<b>2.7000e-004</b>	<b>7.0000e-005</b>	<b>0.0000</b>	<b>7.0000e-005</b>	<b>0.0000</b>	<b>0.4511</b>	<b>0.4511</b>	<b>4.0000e-005</b>	<b>0.0000</b>	<b>0.4521</b>

**3.3 Site Prep - 2021**

**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.7000e-004	3.7900e-003	4.5200e-003	1.0000e-005		2.2000e-004	2.2000e-004		2.1000e-004	2.1000e-004	0.0000	0.5459	0.5459	1.8000e-004	0.0000	0.5504
<b>Total</b>	<b>3.7000e-004</b>	<b>3.7900e-003</b>	<b>4.5200e-003</b>	<b>1.0000e-005</b>	<b>0.0000</b>	<b>2.2000e-004</b>	<b>2.2000e-004</b>	<b>0.0000</b>	<b>2.1000e-004</b>	<b>2.1000e-004</b>	<b>0.0000</b>	<b>0.5459</b>	<b>0.5459</b>	<b>1.8000e-004</b>	<b>0.0000</b>	<b>0.5504</b>

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**3.3 Site Prep - 2021**

**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.4000e-004	4.0500e-003	7.1000e-004	2.0000e-005	4.2000e-004	2.0000e-005	4.4000e-004	1.2000e-004	2.0000e-005	1.3000e-004	0.0000	1.5633	1.5633	2.0000e-005	0.0000	1.5639
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6000e-004	1.3000e-004	1.2200e-003	0.0000	3.7000e-004	0.0000	3.7000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3008	0.3008	1.0000e-005	0.0000	0.3010
<b>Total</b>	<b>3.0000e-004</b>	<b>4.1800e-003</b>	<b>1.9300e-003</b>	<b>2.0000e-005</b>	<b>7.9000e-004</b>	<b>2.0000e-005</b>	<b>8.1000e-004</b>	<b>2.2000e-004</b>	<b>2.0000e-005</b>	<b>2.3000e-004</b>	<b>0.0000</b>	<b>1.8641</b>	<b>1.8641</b>	<b>3.0000e-005</b>	<b>0.0000</b>	<b>1.8649</b>

**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.7000e-004	3.7900e-003	4.5200e-003	1.0000e-005		2.2000e-004	2.2000e-004		2.1000e-004	2.1000e-004	0.0000	0.5459	0.5459	1.8000e-004	0.0000	0.5504
<b>Total</b>	<b>3.7000e-004</b>	<b>3.7900e-003</b>	<b>4.5200e-003</b>	<b>1.0000e-005</b>	<b>0.0000</b>	<b>2.2000e-004</b>	<b>2.2000e-004</b>	<b>0.0000</b>	<b>2.1000e-004</b>	<b>2.1000e-004</b>	<b>0.0000</b>	<b>0.5459</b>	<b>0.5459</b>	<b>1.8000e-004</b>	<b>0.0000</b>	<b>0.5504</b>

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**3.3 Site Prep - 2021**

**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.4000e-004	4.0500e-003	7.1000e-004	2.0000e-005	4.2000e-004	2.0000e-005	4.4000e-004	1.2000e-004	2.0000e-005	1.3000e-004	0.0000	1.5633	1.5633	2.0000e-005	0.0000	1.5639
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6000e-004	1.3000e-004	1.2200e-003	0.0000	3.7000e-004	0.0000	3.7000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3008	0.3008	1.0000e-005	0.0000	0.3010
<b>Total</b>	<b>3.0000e-004</b>	<b>4.1800e-003</b>	<b>1.9300e-003</b>	<b>2.0000e-005</b>	<b>7.9000e-004</b>	<b>2.0000e-005</b>	<b>8.1000e-004</b>	<b>2.2000e-004</b>	<b>2.0000e-005</b>	<b>2.3000e-004</b>	<b>0.0000</b>	<b>1.8641</b>	<b>1.8641</b>	<b>3.0000e-005</b>	<b>0.0000</b>	<b>1.8649</b>

**3.4 Drill Work - 2021**

**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3848	3.4689	2.3876	8.9500e-003		0.1255	0.1255		0.1154	0.1154	0.0000	786.2025	786.2025	0.2543	0.0000	792.5593
<b>Total</b>	<b>0.3848</b>	<b>3.4689</b>	<b>2.3876</b>	<b>8.9500e-003</b>	<b>1.0000e-005</b>	<b>0.1255</b>	<b>0.1255</b>	<b>0.0000</b>	<b>0.1154</b>	<b>0.1154</b>	<b>0.0000</b>	<b>786.2025</b>	<b>786.2025</b>	<b>0.2543</b>	<b>0.0000</b>	<b>792.5593</b>

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**3.4 Drill Work - 2021**

**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	9.7000e-004	0.0276	4.8300e-003	1.1000e-004	2.8600e-003	1.3000e-004	2.9900e-003	7.9000e-004	1.2000e-004	9.1000e-004	0.0000	10.6306	10.6306	1.5000e-004	0.0000	10.6344
Vendor	4.2000e-004	0.0136	2.6600e-003	3.0000e-005	7.7000e-004	4.0000e-005	8.1000e-004	2.2000e-004	4.0000e-005	2.6000e-004	0.0000	3.2074	3.2074	3.8000e-004	0.0000	3.2169
Worker	0.0102	8.4500e-003	0.0779	2.1000e-004	0.0238	1.5000e-004	0.0239	6.3200e-003	1.3000e-004	6.4500e-003	0.0000	19.2503	19.2503	6.2000e-004	0.0000	19.2659
<b>Total</b>	<b>0.0116</b>	<b>0.0496</b>	<b>0.0854</b>	<b>3.5000e-004</b>	<b>0.0274</b>	<b>3.2000e-004</b>	<b>0.0277</b>	<b>7.3300e-003</b>	<b>2.9000e-004</b>	<b>7.6200e-003</b>	<b>0.0000</b>	<b>33.0884</b>	<b>33.0884</b>	<b>1.1500e-003</b>	<b>0.0000</b>	<b>33.1171</b>

**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3848	3.4689	2.3876	8.9500e-003		0.1255	0.1255		0.1154	0.1154	0.0000	786.2015	786.2015	0.2543	0.0000	792.5584
<b>Total</b>	<b>0.3848</b>	<b>3.4689</b>	<b>2.3876</b>	<b>8.9500e-003</b>	<b>0.0000</b>	<b>0.1255</b>	<b>0.1255</b>	<b>0.0000</b>	<b>0.1154</b>	<b>0.1154</b>	<b>0.0000</b>	<b>786.2015</b>	<b>786.2015</b>	<b>0.2543</b>	<b>0.0000</b>	<b>792.5584</b>













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**3.7 Architectural Coating - 2022**

**Mitigated Construction Off-Site**

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

**4.0 Operational Detail - Mobile**

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**4.1 Mitigation Measures Mobile**

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

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Golf Course	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	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
Golf Course	14.70	6.60	6.60	33.00	48.00	19.00	52	39	9

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Golf Course	0.492212	0.031147	0.169820	0.116157	0.015815	0.004502	0.033398	0.126328	0.002363	0.001519	0.005062	0.001083	0.000594

5.0 Energy Detail

Historical Energy Use: N



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**5.2 Energy by Land Use - Natural Gas**

**Mitigated**

	Natural Gas 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					
Golf Course	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
<b>Total</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>		<b>0.0000</b>	<b>0.0000</b>		<b>0.0000</b>							

**5.3 Energy by Land Use - Electricity**

**Unmitigated**

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Golf Course	0	0.0000	0.0000	0.0000	0.0000
<b>Total</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>

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**5.3 Energy by Land Use - Electricity**

**Mitigated**

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Golf Course	0	0.0000	0.0000	0.0000	0.0000
<b>Total</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>

**6.0 Area Detail**

**6.1 Mitigation Measures Area**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.7000e-003	0.0000	4.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	7.0000e-005	7.0000e-005	0.0000	0.0000	8.0000e-005
Unmitigated	1.7000e-003	0.0000	4.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	7.0000e-005	7.0000e-005	0.0000	0.0000	8.0000e-005

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**6.2 Area by SubCategory**

**Unmitigated**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.6900e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	4.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	7.0000e-005	7.0000e-005	0.0000	0.0000	8.0000e-005
<b>Total</b>	<b>1.6900e-003</b>	<b>0.0000</b>	<b>4.0000e-005</b>	<b>0.0000</b>		<b>0.0000</b>	<b>0.0000</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>7.0000e-005</b>	<b>7.0000e-005</b>	<b>0.0000</b>	<b>0.0000</b>	<b>8.0000e-005</b>

**Mitigated**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.6900e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	4.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	7.0000e-005	7.0000e-005	0.0000	0.0000	8.0000e-005
<b>Total</b>	<b>1.6900e-003</b>	<b>0.0000</b>	<b>4.0000e-005</b>	<b>0.0000</b>		<b>0.0000</b>	<b>0.0000</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>7.0000e-005</b>	<b>7.0000e-005</b>	<b>0.0000</b>	<b>0.0000</b>	<b>8.0000e-005</b>

**7.0 Water Detail**

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**7.1 Mitigation Measures Water**

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	1.6243	1.7000e-004	3.0000e-005	1.6387
Unmitigated	1.6243	1.7000e-004	3.0000e-005	1.6387

**7.2 Water by Land Use**

**Unmitigated**

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Golf Course	0 / 3.61019	1.6243	1.7000e-004	3.0000e-005	1.6387
<b>Total</b>		<b>1.6243</b>	<b>1.7000e-004</b>	<b>3.0000e-005</b>	<b>1.6387</b>

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**7.2 Water by Land Use**

**Mitigated**

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Golf Course	0 / 3.61019	1.6243	1.7000e-004	3.0000e-005	1.6387
<b>Total</b>		<b>1.6243</b>	<b>1.7000e-004</b>	<b>3.0000e-005</b>	<b>1.6387</b>

**8.0 Waste Detail**

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**8.1 Mitigation Measures Waste**

**Category/Year**

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.5724	0.0338	0.0000	1.4182
Unmitigated	0.5724	0.0338	0.0000	1.4182

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**8.2 Waste by Land Use**

**Unmitigated**

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Golf Course	2.82	0.5724	0.0338	0.0000	1.4182
<b>Total</b>		<b>0.5724</b>	<b>0.0338</b>	<b>0.0000</b>	<b>1.4182</b>

**Mitigated**

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Golf Course	2.82	0.5724	0.0338	0.0000	1.4182
<b>Total</b>		<b>0.5724</b>	<b>0.0338</b>	<b>0.0000</b>	<b>1.4182</b>

**9.0 Operational Offroad**

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Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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**10.0 Stationary Equipment**

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**Fire Pumps and Emergency Generators**

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
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**Boilers**

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
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**User Defined Equipment**

Equipment Type	Number
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**11.0 Vegetation**

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Appendix B-2  
**Greenhouse Gas Emissions  
Reduction Plan**

# Greenhouse Gas(GHG) Emissions Reduction Plan Consistency Determination

## For Projects Using Contractors or Other Outside Labor

This form is to be used by DWR project managers to document a DWR CEQA project’s consistency with the DWR Greenhouse Gas Emissions Reduction Plan. This form is to be used only when DWR is the Lead Agency and when contractors or outside labor and equipment are used to implement the project.

Additional Guidance on filling out this form can be found at:  
[http://dwrclimatechange.water.ca.gov/guidance\\_resources.cfm](http://dwrclimatechange.water.ca.gov/guidance_resources.cfm)

The DWR Greenhouse Gas Emissions Reduction Plan can be accessed at:  
<https://water.ca.gov/Programs/All-Programs/Climate-Change-Program/Climate-Action-Plan>

<b>Project Name:</b>	San Luis Canal Geotechnical Investigations Project
<b>Environmental Document Type:</b>	Environmental Assessment/Initial Study and Mitigated Negative Declaration
<b>Manager’s Name:</b>	
<b>Manager’s E-mail:</b>	
<b>Division:</b>	
<b>Office, Branch, or Field Division:</b>	

<b>Short Project Description:</b>
The primary purpose of the proposed project is to provide geologic information needed to inform engineering and design plans for the proposed San Luis Canal Embankment and Liner Raise Project.

<b>Project GHG Emissions Summary:</b>		
Total Construction Emissions	822.6031	mtCO <sub>2</sub> e
Maximum Annual Construction Emissions	822.6031	mtCO <sub>2</sub> e
<input checked="" type="checkbox"/> All other emissions from the project not accounted for above will occur as ongoing operational, maintenance, or business activity emissions and therefore have already been accounted for and analyzed in the GGERP.		

<b>Extraordinary Construction Project Determination:</b>
Do total project construction emissions exceed 25,000 mtCO <sub>2</sub> e for the entire construction phase or exceed 12,500 mtCO <sub>2</sub> e in any single year of construction?
<input checked="" type="checkbox"/> No- Additional analysis not required <input type="checkbox"/> Yes - Project specific emissions mitigation measures have been included in the environmental analysis document for the project

<p><b>Project GHG Reduction Plan Checklist:</b></p> <p><input type="checkbox"/> All Project Level GHG Emissions Reduction Measures have been incorporated into the design or implementation plan for the project. (<a href="#">Project Level GHG Emissions Reduction Measures</a>)</p> <p style="text-align: center;">Or</p> <p><input type="checkbox"/> All feasible Project Level GHG Emissions Reduction Measures have been incorporated into the design or implementation plan for the project and Measures not incorporated have been listed and determined not to apply to the proposed project (include as an attachment)</p>
<p><input type="checkbox"/> Project does not conflict with any of the Specific Action GHG Emissions Reduction Measures (<a href="#">Specific Action GHG Emissions Reduction Measures</a>)</p>
<p>Would implementation of the project result in additional energy demands on the SWP system of 15 GWh/yr or greater?</p> <p><input type="checkbox"/> Yes    <input checked="" type="checkbox"/> No</p> <p>If you answered Yes, attach a letter documenting that the project has consulted with the DWR SWP Power and Risk Office regarding the additional power requirements of the project.</p>
<p>Is there substantial evidence that the effects of the proposed project may be cumulatively considerable notwithstanding the proposed project's compliance with the requirements of the DWR GHG Reduction Plan?</p> <p><input type="checkbox"/> Yes    <input checked="" type="checkbox"/> No</p> <p>If you answered Yes, the project is not eligible for streamlined analysis of GHG emissions using the DWR GHG Emissions Reduction Plan. (See CEQA Guidelines, section 15183.5, subdivision (b)(2).)</p>

Based on the information provided above and information provided in associated environmental documentation completed pursuant to the above referenced project, the DWR CEQA Climate Change Committee has determined that:

- The entire proposed project is consistent with the DWR Greenhouse Gas Reduction Plan and the greenhouse gases emitted by the project are covered by the plan's analysis.

The operational and maintenance phase of the project is consistent with the DWR Greenhouse Gas Reduction Plan and the greenhouse gases emitted by the project are covered by the plan's analysis. Emissions from the construction phase of the project are not covered by the DWR Greenhouse Gas Emissions Reduction Plan and will be mitigated as part of the project.

Project Manager Signature: \_\_\_\_\_ Date: \_\_\_\_\_

C4 Approval Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**Attachments:**

- GHG Emissions Inventory
- List and Explanation of excluded Project level GHG Emissions Reduction Measures
- SWP Power and Risk Office Consultation Letter

Links:  
<https://current.water.ca.gov/programs/icc/SitePages/Home.aspx>  
<https://water.ca.gov/Programs/All-Programs/Climate-Change-Program>

Appendix C  
**Biological Resources Technical  
Report**

# SAN LUIS CANAL GEOTECHNICAL INVESTIGATIONS PROJECT

Biological Resources Technical Report

May 2021



# SAN LUIS CANAL GEOTECHNICAL INVESTIGATIONS PROJECT

Biological Resources Technical Report

May 2021

Prepared by  
California Department of Water Resources  
Division of Engineering



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# SAN LUIS CANAL GEOTECHNICAL INVESTIGATIONS PROJECT

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## Biological Resources Technical Report

### 1.0 Introduction and Purpose

The California Department of Water Resources (DWR) South Central Region Office (SCRO) conducted this assessment of biological resources for the San Luis Canal (SLC) Geotechnical Investigations Project (Project). The primary purpose of the Project is to provide geologic information needed to inform engineering and design plans for elevating the embankments and concrete liner at Pools 17, 18, 20 and 21.

The SLC traverses portions of the San Joaquin Valley (Valley) that have experienced subsidence<sup>1</sup>. Land subsidence in the Valley was first noted near the Delano area in 1935. Since that time, the Valley has undergone several periods of regional aquifer compaction as a result of groundwater extraction, largely for agricultural uses. The resulting land subsidence has reduced the freeboard<sup>2</sup> and capacity of the California Aqueduct system to transport floodwater and deliver irrigation water. The decrease in lined freeboard has decreased or eliminated the potential to store additional water in some Aqueduct pools. The Aqueduct is segmented into pools through a series of check structures, which impound water and offer storage. The reduced storage forces more pumping during expensive periods to meet direct downstream demand.

In June 2017, DWR prepared the California Aqueduct Subsidence Study, which summarized the magnitude, location, and effects of historic and current subsidence on the Aqueduct system. The study determined that in order to maintain delivery capacity, portions of the Aqueduct that have experienced subsidence require retrofitting to extend the concrete liner within the Aqueduct prism to restore storage and conveyance capacity.

In coordination with the US Department of Interior Bureau of Reclamation (Reclamation), DWR is proposing to restore the capacity of Pools 17, 18, 20 and 21 from Aqueduct Milepost (MP) 122 to MP 143 and MP 155 to MP 172 of the SLC in Fresno and Kings Counties (**Figures 1 through 4, located in Appendix A; all Figures referenced in this document are in Appendix A**). Up to 520 geotechnical investigations would occur along the SLC embankments of Pools 17, 18, 20 and 21, within adjacent borrow sites, near utility and irrigation pipelines and specified bridges. Most investigations would occur within the existing DWR/Reclamation right-of-way.

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<sup>1</sup> Local or regional drop in ground surface elevation

<sup>2</sup> Vertical distance between the design water surface and the top of the concrete canal lining

Elevating the embankment would provide the ability to increase the concrete-lined freeboard to mitigate for subsidence-related loss of storage and flow capacity in this segment of the SLC. The Project would:

- Characterize and evaluate the existing soil and subsurface conditions beneath the embankment, bridges, irrigation and utility crossings.
- Evaluate the existing engineered embankment and liner foundation to determine appropriate excavation depths and the requirements for subsidence control measures.
- Evaluate soil composition and chemistry of the potential borrow sites<sup>3</sup> that would provide materials to raise the embankment.
- Evaluate soil for potential contaminants adjacent to abandoned under crossing pipelines.

## 2.0 Project Description

The Project would use a combination of investigation methods to characterize the foundational soil requirements and soil chemistry properties at up to 520 locations. Investigation methods would be conducted using Cone Penetrometer Testing (CPT), Hollow Stem Auger (HSA), and Hand Auger (HA) drilling methods. HSA and CPT drilling would be completed by drilling contractors, while the HA drilling would be completed by DWR engineering geologists using stainless-steel hand augers. CPTs would involve using a truck-mounted rig to push soil probes into 2.5-inch diameter hand augured holes. HSA methods include rotating the HSA in previously hand augured holes to extract soil cuttings for logging and sampling purposes. All soil cuttings generated by HA or HSA drilling methods would be disposed of at either local landfills or spread on site. Soil cuttings are not generated using CPT drilling methods. Sample location adjustments would be made to avoid the potential to impact biological resources, and in response to observations made in the field during implementation. The number of holes drilled per day would be dependent on the maximum drilling depth and distance between holes. Approximately two to three 15 and 32 foot-holes and one 100-foot hole would be drilled per day. For samples using the HA method, five to six holes would be drilled per day. **Table 1** summarizes approximate sample quantities by exploration area.

**TABLE 1**  
**SAMPLE QUANTITIES BY EXPLORATION AREA**

Exploration Area	Approximate Number	Maximum Drilling Depth (feet below ground surface)
<b>Embankment Investigations</b>		
CPT	164	100
HSA	57	100
<b>Borrow Area Investigations</b>		
HSA	13	15
HA	110	3-10

<sup>3</sup> A borrow site is an excavated area where material has been dug for use as fill material at another location.

Exploration Area	Approximate Number	Maximum Drilling Depth (feet below ground surface)
<b>Pipeline Area Investigations</b>		
HSA	12	15
<b>Bridge Area Investigations</b>		
HSA	48	100
<b>Irrigation Crossings</b>		
HSA	72	70

### 3.0 Project Location

The Project investigations would span approximately 41 miles of the SLC. Investigations would occur on both sides of the SLC and adjacent private properties, covering approximately 3,814 acres, though the actual area of impact is focused on the intermittent geotechnical boring locations within the Area of Influence (AOI). The Project footprint as described above is managed by one of DWR's Operation and Maintenance field offices, San Luis Field Division.

### 4.0 Methods

DWR has collected environmental data in the Project area in conjunction with ongoing maintenance projects. Environmental data recorded within the Project area since 2015 is included and analyzed in this technical report. This includes environmental survey data collected as part of ongoing maintenance projects as well as the proposed Project. A summary of the surveys conducted in the Project area is provided in **Table 2**.

**TABLE 2  
SURVEYS CONDUCTED WITHIN THE AOI FROM 2015 TO 2020<sup>1</sup>**

Project/Activity	Year	Location	Survey Type
Westside Detention Basin Maintenance	2015	Pool 20	Protocol Level Swainson's Hawk
Westside Detention Basin Maintenance	2015	Pool 20	Protocol Level Blunt-nosed Leopard Lizard
Rubber Dam Geotech	2015	Pool 20	Preconstruction Survey
Erosion Repair and Aqueduct Maintenance	2015	Pool 17	Biological Resources Assessment
Erosion Repair and Aqueduct Maintenance	2015	Pool 18	Biological Resources Assessment
Erosion Repair and Aqueduct Maintenance	2015	Pool 20	Biological Resources Assessment
Erosion Repair and Aqueduct Maintenance	2015	Pool 21	Biological Resources Assessment
Access Road Maintenance, Mowing and Grading	2015	Pool 17	Biological Resources Assessment
Access Road Maintenance, Mowing and Grading	2015	Pool 18	Biological Resources Assessment
Access Road Maintenance, Mowing and Grading	2015	Pool 20	Biological Resources Assessment
Access Road Maintenance, Mowing and Grading	2015	Pool 21	Biological Resources Assessment
Westside Detention Basin Maintenance	2016	Pool 20	Protocol Level Swainson's Hawk
Westside Detention Basin Maintenance	2016	Pool 20	Protocol Level Blunt-nosed Leopard Lizard
Cantua Stream Group Improvements Project	2016	Pool 17	Habitat Assessment
Cantua Stream Group Improvements Project	2016	Pool 17	Protocol Level Burrowing Owl

Project/Activity	Year	Location	Survey Type
Cantua Stream Group Improvements Project	2016	Pool 18	Habitat Assessment
Cantua Stream Group Improvements Project	2016	Pool 18	Protocol Level Burrowing Owl
Cantua Stream Group Improvements Project	2016	Pool 17	Burrowing Owl Construction Monitoring
Cantua Stream Group Improvements Project	2016	Pool 18	Burrowing Owl Construction Monitoring
Access Road Maintenance, Mowing and Grading	2016	Pool 17	Biological Resources Assessment
Access Road Maintenance, Mowing and Grading	2016	Pool 18	Biological Resources Assessment
Access Road Maintenance, Mowing and Grading	2016	Pool 20	Biological Resources Assessment
Access Road Maintenance, Mowing and Grading	2016	Pool 21	Biological Resources Assessment
Westside Detention Basin Maintenance	2017	Pool 20	Protocol Level Swainson's Hawk
Westside Detention Basin Maintenance	2017	Pool 20	Protocol Level Blunt-nosed Leopard Lizard
Rubber Dam Repair	2017	Pool 20	Preconstruction Survey
Cantua Stream Group Improvements Project	2017	Pool 17	Burrowing Owl Construction Monitoring
Cantua Stream Group Improvements Project	2017	Pool 18	Burrowing Owl Construction Monitoring
Erosion Repair and Aqueduct Maintenance	2017	Pool 20	Biological Resources Assessment
Erosion Repair and Aqueduct Maintenance	2017	Pool 21	Biological Resources Assessment
Access Road Maintenance, Mowing and Grading	2017	Pool 17	Biological Resources Assessment
Access Road Maintenance, Mowing and Grading	2017	Pool 18	Biological Resources Assessment
Access Road Maintenance, Mowing and Grading	2017	Pool 20	Biological Resources Assessment
Access Road Maintenance, Mowing and Grading	2017	Pool 21	Biological Resources Assessment
Westside Detention Basin Maintenance	2018	Pool 20	Protocol Level Swainson's Hawk
Westside Detention Basin Maintenance	2018	Pool 20	Protocol Level Blunt-nosed Leopard Lizard
Erosion Repair and Aqueduct Maintenance	2018	Pool 17	Biological Resources Assessment
Erosion Repair and Aqueduct Maintenance	2018	Pool 18	Biological Resources Assessment
Westside Detention Basin Maintenance	2019	Pool 20	Protocol Level Swainson's Hawk
Westside Detention Basin Maintenance	2019	Pool 20	Protocol Level Blunt-nosed Leopard Lizard
California Aqueduct Subsidence Program	2019	Pool 20	Reconnaissance Burrowing Owl
California Aqueduct Subsidence Program	2019	Pool 20	Reconnaissance Den and Burrow Survey
California Aqueduct Subsidence Program	2019	Pool 20	Protocol Level Swainson's Hawk
California Aqueduct Subsidence Program	2019	Pool 21	Reconnaissance Burrowing Owl
California Aqueduct Subsidence Program	2019	Pool 21	Reconnaissance Den and Burrow Survey
California Aqueduct Subsidence Program	2019	Pool 21	Protocol Level Swainson's Hawk
Irrigation Crossing Pipe Inspections and Repair Project	2019	Pool 17	Reconnaissance Den and Burrow Survey
Irrigation Crossing Pipe Inspections and Repair Project	2019	Pool 17	Preconstruction Survey
Irrigation Crossing Pipe Inspections and Repair Project	2019	Pool 18	Reconnaissance Den and Burrow Survey
Irrigation Crossing Pipe Inspections and Repair Project	2019	Pool 18	Preconstruction Survey
Irrigation Crossing Pipe Inspections and Repair Project	2019	Pool 20	Reconnaissance Den and Burrow Survey
Irrigation Crossing Pipe Inspections and Repair Project	2019	Pool 20	Preconstruction Survey
Irrigation Crossing Pipe Inspections and Repair Project	2019	Pool 21	Reconnaissance Den and Burrow Survey
Irrigation Crossing Pipe Inspections and Repair Project	2019	Pool 21	Preconstruction Survey
Erosion Repair and Aqueduct Maintenance	2019	Pool 17	Biological Resources Assessment
Erosion Repair and Aqueduct Maintenance	2019	Pool 18	Biological Resources Assessment
Erosion Repair and Aqueduct Maintenance	2019	Pool 20	Biological Resources Assessment

Project/Activity	Year	Location	Survey Type
Erosion Repair and Aqueduct Maintenance	2019	Pool 21	Biological Resources Assessment
Access Road Maintenance, Mowing and Grading	2019	Pool 17	Biological Resources Assessment
Access Road Maintenance, Mowing and Grading	2019	Pool 18	Biological Resources Assessment
Access Road Maintenance, Mowing and Grading	2019	Pool 20	Biological Resources Assessment
Access Road Maintenance, Mowing and Grading	2019	Pool 21	Biological Resources Assessment
Westside Detention Basin Maintenance	2020	Pool 20	Protocol Level Swainson's Hawk
Westside Detention Basin Maintenance	2020	Pool 20	Protocol Level Blunt-nosed Leopard Lizard
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Erosion Repair and Aqueduct Maintenance	2020	Pool 18	Biological Resources Assessment
Erosion Repair and Aqueduct Maintenance	2020	Pool 20	Biological Resources Assessment
Erosion Repair and Aqueduct Maintenance	2020	Pool 21	Biological Resources Assessment
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Access Road Maintenance, Mowing and Grading	2020	Pool 18	Biological Resources Assessment
Access Road Maintenance, Mowing and Grading	2020	Pool 20	Biological Resources Assessment
Access Road Maintenance, Mowing and Grading	2020	Pool 21	Biological Resources Assessment
California Aqueduct Subsidence Program	2020	Pool 17	Vegetation Mapping
California Aqueduct Subsidence Program	2020	Pool 18	Vegetation Mapping
California Aqueduct Subsidence Program	2020	Pool 20	Vegetation Mapping
California Aqueduct Subsidence Program	2020	Pool 21	Vegetation Mapping
California Aqueduct Subsidence Program	2020	Pool 17	Land Use Surveys
California Aqueduct Subsidence Program	2020	Pool 18	Land Use Surveys
California Aqueduct Subsidence Program	2020	Pool 20	Land Use Surveys
California Aqueduct Subsidence Program	2020	Pool 21	Land Use Surveys
California Aqueduct Subsidence Program	2020	Pool 17	Reconnaissance Den and Burrow Survey
California Aqueduct Subsidence Program	2020	Pool 18	Reconnaissance Den and Burrow Survey

<sup>1</sup> This table does not include more localized maintenance projects in which special status species observations may have been made but were not detected during a focused survey both in scope or over a large area. However, any species observations collected during these other types of projects not shown in this table have been included in this report.

## 4.1 Literature Review

Various resources were consulted to generate a thorough list of potential special-status species that could occur within 3 miles of the proposed Project footprint; resources included the California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB) by isolating the occurrences within the search radius using ArcMap (**Appendix B**), the United States Fish and Wildlife Services (USFWS) Information for Planning and Consultation (IPaC) Online System (USFWS, 2020) (**Appendix C**), and Critical Habitat designations (USFWS, 2018).

## 4.2 Fields Surveys

Field surveys consisted of focused and general evaluations for known and potential special-status species presence. The extent of each survey area was dependent on the presence of suitable

habitat for potential species, the size of the specific maintenance project footprint, and the level of disturbance generated from project activities. All relevant survey data compiled from the last five years in the AOI, which includes the Project footprint and adjacent lands, (**Figures 5 through 8**), is included in this report. Focused surveys were conducted in the AOI for vegetation, land use, and biological resources including burrowing owl (*Athene cunicularia*), canid den and burrows, and Swainson's hawk (*Buteo swainsoni*). General evaluations or biological resource surveys were conducted in localized areas throughout the AOI. Descriptions of the focused surveys and general habitat assessments are provided below.

## Land Use Mapping

Land use mapping surveys were conducted in 2020 in the AOI between MP 122 and MP 143 and MP 155 to MP 172. Surveys consisted of driving accessible roads within the SLC right-of-way and stopping when necessary to determine the land use in each parcel. Mapping covered the SLC from the outer boundary of the right-of-way property to the private property parcel boundaries that border the right-of-way. Digitized maps were created by using visible field boundaries based on satellite imagery. Adjacent land use data was recorded using ArcGIS Collector. Land use data recorded included crop type, idle or fallow fields, and native vegetation.

## Vegetation and Habitat Mapping

Vegetation and habitat mapping surveys were conducted in 2019 in the AOI between MP 122 and MP 172. Surveys consisted of driving all accessible roads within the SLC right-of-way and stopping when necessary to determine the vegetation alliance present. Mapping covered the SLC right-of-way from the land side edge of the SLC road to the outer boundary of the right-of-way.

Vegetation stands were defined by the dominant species and categorized into vegetation alliances using *A Manual of California Vegetation* (MCV 2009). Each stand identified had both compositional and structural integrity as defined in the CDFW-CNPS Protocol for the Combined Vegetation Rapid Assessment and Relevé Field Form (CDFW-CNPS Protocol 2019). The minimum mapping unit in the CDFW-CNPS Protocol of 1 acre for upland vegetation and 0.5 acre for special stands, including riparian areas and wetlands, was used in the assessments.

Vegetation and habitat data were created or edited using ArcGIS Collector by working with previously digitized maps of delineated vegetation types.

## General Habitat Assessment

General habitat assessment surveys have been conducted in various portions of the AOI since 2015 and continue to occur annually for maintenance projects such as erosion repairs and vegetation management. Site-specific surveys were conducted within the AOI at a variety of locations determined by proximity to maintenance projects. During general habitat assessments, all ancillary observations of special-status species and their potential habitat was recorded. These surveys included pedestrian, windshield, or a combination thereof using the SLC access roads, top embankments roads, and toe roads. A species or species' resource was confirmed using a spotting scope or binoculars. In areas of potential interest, such as areas with sensitive or native habitat features, walking surveys were conducted. If vegetation removal was a potential impact

and native habitat was observed, surveys for rare or sensitive plants were conducted. Rare or sensitive plant surveys were conducted on foot by walking transects or using spot sampling within the project footprint. If possible, surveys were conducted during optimal bloom and growth periods, typically April through June.

### **Blunt-nosed Leopard Lizard**

Blunt-nosed leopard lizard (BNLL) surveys have been conducted at the Westside Detention Basin (WDB) annually since 2000. The WDB is located adjacent to the SLC for flood control. Surveys followed the *Approved Survey Methodology for the Blunt-Nosed Leopard Lizard* (CDFW, 2004 and 2019) and were conducted when temperature and weather conditions were consistent with survey protocols. Surveys have been conducted approximately 1-mile upstream and downstream of where the Arroyo Pasajero channel intersects State Route 269 (**Figure 7**). The channel ends over a half-mile west of SLC MP 154 where flood waters disperse within the WDB.

### **Swainson's Hawk**

Swainson's hawk (SWHA) surveys were conducted in 2015 and 2016 in the AOI along the SLC between MP 128 and 141. SWHA surveys have been conducted annually since 2015 where the SLC meets the WDB, MP 153 to MP 158. Additionally, SWHA surveys were conducted between MP 155 and MP 172 in 2019. Surveys were conducted by windshield and methods were consistent with the *Swainson's Hawk Technical Advisory Committee Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley May 31, 2000* (SHTAC 2000). During each survey, an established route was driven slowly to investigate observed raptors or nests. The survey start location alternated with each survey conducted.

Additionally, ancillary observations of nests were documented during annual operation and maintenance environmental clearance assessments between MP 122 to MP 143 and MP 155 to MP 172 since 2015.

### **Burrowing Owl**

Burrowing owl (BUOW) surveys were conducted in various portions of the AOI since 2015 (Table 2). In 2015, a reconnaissance survey was conducted for a flood improvement project. During this reconnaissance survey, all potential BUOW burrow locations between MPs 128.48 to 141.6 were recorded with a Juno global positioning system (GPS) device. In 2016, BUOW surveys were conducted in accordance with the 2012 *Staff Report on Burrowing Owl Mitigation* breeding season survey protocol in Appendix D (CDFW 2012) between the same MPs. The surveys were primarily conducted by windshield in areas where the surrounding area was clearly visible from the vehicle; however, transects were walked where windshield surveys were not adequate to determine presence of BUOW or burrows. Transects were typically spaced 25 to 60 feet apart, depending on topography and vegetation height and density. In 2016 and 2017, additional surveys between MPs 128.48 to 141.6 were conducted to monitor known BUOW occurrences during embankment raises and other related construction activities. More information and maps of surveys can be found in **Appendix D**.

In 2019, all potential BUOW burrow locations between MPs 108.65 to 143.24 and 155.65 to MP 172.40 were recorded and mapped using ArcGIS Collector during proposed geologic activities located at 19 irrigation crossings. The surveys were primarily conducted by windshield in areas where the surrounding landscape was clearly visible from the vehicle; however, transects were walked where windshield surveys were not adequate to determine presence of BUOW or their burrows. Transects were typically spaced 25 to 60 feet apart, depending on topography and vegetation height and density. All potential BUOW burrow locations near various irrigation crossings (DWR 2019) were recorded and mapped using ArcGIS Collector. These burrows were monitored to ensure BUOW did not enter during work to prevent entry into 50-meter buffer zones.

## Canid Den and Burrows

Canid den and burrow surveys were conducted in 2019 and 2020 in the AOI on both sides of the SLC from MP 122 to MP 143 and MP 155 to MP 172. Surveys were conducted by windshield and on foot to gain one-hundred percent visual coverage of the Project footprint. Surveyors drove all accessible roads within the Project area and scanned for potential canid dens and medium-sized burrows. In areas where visual coverage could not be obtained by windshield, surveyors walked transects, generally 30 feet wide and in areas with thick vegetation, steep inclines, and in areas where roads were not present. All identified canid dens were mapped using ArcGIS Collector. The condition of the dens and possible species occupying the dens were documented, and photographs were taken.

## 5.0 Biological Survey Results

### 5.1 General Setting

The AOI is located in the western San Joaquin Valley. The average temperature ranges from a high of 77 degrees Fahrenheit to a low of 50 degrees Fahrenheit. The average annual precipitation is 8.4 inches (US Climate Data, 2019).

The SLC sits on land alternating between three landforms: floodplain, alluvial fan, and fan skirt (NRCS, 2017). Land in the upper watershed is mainly used for cattle and sheep grazing. Land use on the alluvial fan is dominated by irrigated agriculture.

The Cantua Creek Stream Group (CCSG) watershed is located west of the Project Pools 17 and 18. It originates on the eastern side of the California Coast Range (**Figure 9**). It has a drainage area of 201 square miles. Elevations range from 315 feet near the SLC to over 5,100 feet at Santa Rita Peak. The Cantua Creek Stream watershed consists of five major creeks: Arroyo Hondo, Cantua, Salt, Martinez, and Domengine Creeks. These creeks drain a portion of the Coast Range and generally flow easterly into the western San Joaquin Valley. Presently, floodwaters from these creeks terminate at four locations, or basins, along an approximate 13-mile stretch of the SLC, with Martinez Creek flowing into Salt Creek approximately three miles upstream of the SLC. The large drainage channels can carry significant floodwater and sediment volumes to the basins.

The Arroyo Pasajero Stream Group (APSG) watershed is also located west of the Project, near Pools 20 and 21. It originates on the eastern side of the California Coast Range (**Figure 10**). Elevations range from 325 feet near the SLC to over 5,000 feet to the Diablo Range. The Diablo Range consists mainly of Cretaceous marine rocks such as mudstone, sandstone, and shale. These rock types are known to contain chrysotile asbestos and enter the waterway when erosion occurs. The Arroyo Pasajero and the WDB, which acts as a settling basin, is known to contain the chrysotile asbestos. The APSG watershed consists of four ephemeral creeks that are tributaries to Arroyo Pasajero: Zapato Chino, Los Gatos, Warthan, and Jacalitos Creek. These creeks drain a portion of the Coast Range and generally flow easterly into the western San Joaquin Valley. The large drainage channels can carry significant floodwater and sediment volumes to the Arroyo Pasajero and WDB. The WDB is over 3,500 acres and is where the Arroyo Pasajero channel ends. Features such as a dike, gabion weirs, drain inlets, and a rubber dam were built into the WDB and SLC to control flows, manage sediment and protect adjacent properties.

Additional natural features along the SLC include the Kettleman Hills that border the west. This small range is part of the Coast Range and rise to an elevation of 1,200 feet. The range offers unique geological formations and is composed of marine sedimentary rock and it a source for oil drilling (ArcGIS, 2020).

## 5.2 Vegetation

Plant diversity along the SLC and adjacent land varies from year to year dependent on many factors. The most influential factors in the AOI are precipitation, natural processes such as erosion or fire, adjacent land use, and maintenance activities. **Table 3** provides a list of plants observed along the SLC and adjacent lands since 2015.

**TABLE 3**  
**PLANT SPECIES OBSERVED WITHIN THE AOI**

Common Name	Scientific Name
fiddleneck	<i>Amsinckia menziesii</i>
ragweed	<i>Ambrosia psilostachya</i>
quailbrush	<i>Atriplex lentiformis</i>
cattle spinach	<i>Atriplex polycarpa</i>
arundo	<i>Arundo donax</i>
astragalus	<i>Astragalus</i> sp.
slim oat	<i>Avena barbata</i>
wild oat	<i>Avena fatua</i>
coyote bush	<i>Baccharis pilularis</i>
mulefat	<i>Baccharis salicifolia</i>
black mustard	<i>Brassica nigra</i>
foxtail brome	<i>Bromus madritensis</i>
red brome	<i>Bromus madritensis</i> ssp. <i>rubens</i>
ripgut brome	<i>Bromus diandrus</i>

Common Name	Scientific Name
tarweed	<i>Centromadia</i> sp.
localote	<i>Centaurea melitensis</i>
yellow-star thistle	<i>Centaurea solstitialis</i>
bindweed	<i>Convolvulus arvensis</i>
doveweed	<i>Croton setigerus</i>
Jimsonweed	<i>Datura wrightii</i>
tarplant	<i>Deinandra</i> sp.
Canada horseweed	<i>Erigeron canadensis</i>
red-stemmed filaree	<i>Erodium cicutarium</i>
heliotrope	<i>Heliotropium curassavicum</i>
sunflower	<i>Helianthus</i> sp.
foxtail barley	<i>Hordeum murinum</i>
prickly lettuce	<i>Lactuca serriola</i>
Coulter's horseweed	<i>Laennecia coulteri</i>
broadleaved pepperweed	<i>Lepidium latifolium</i>
cheeseweed	<i>Malva parviflora</i>
common mallow	<i>Malva neglecta</i>
horehound	<i>Marrubium vulgare</i>
pineapple weed	<i>Matricaria discoidea</i>
sweet clover	<i>Melilotus</i> sp.
palo verde	<i>Parkinsonia</i> sp.
annual bluegrass	<i>Poa annua</i>
mesquite	<i>Prosopis</i> sp.
curly dock	<i>Rumex crispus</i>
Russian thistle	<i>Salsola tragus</i>
London rocket	<i>Sisymbrium irio</i>
saltcedar	<i>Tamarix</i> sp.
cattails	<i>Typha</i> sp.
stinging nettle	<i>Urtica</i> sp.

### 5.3 Land Use

The land use just outside of the right-of-way, within the AOI, is primarily agricultural production. Land not in agricultural production is typically occupied with produce processing plants, equipment storage, fallow fields, rural residences, or homesteads. Pools 17 (MP 122.07 to MP 132.94), 18 (MP 132.95 to MP 143.22), 20 (MP 155.65 to MP 164.71), and 21 (MP 164.72 to MP 172.42) of the SLC are located within the Westlands Water District, which supplies the majority of surface water for agricultural use in their district. A variety of permanent and annual crops are cultivated within the Westlands Water District service area. The largest acreage of crops within the area are permanent crops such as almonds and pistachios. Annual crops include tomatoes,

cotton, melons, beans, lettuce, onions, garlic, and alfalfa. Annual crops optimal for each growing season are planted after the harvest and amendment of the previous crop and soils. This continual working of the land makes it difficult for local native wildlife and plants to establish.

Land use adjacent to Pool 17 in 2020, (**Figure 11**) was primarily almond and pistachio crops. Other permanent crops observed in small acreages were blueberries and grapes. Annual crops that were observed included processing tomatoes and alfalfa. Several idle parcels were also observed adjacent to the SLC.

Land use adjacent to Pool 18 in 2020 (**Figure 12**) was largely observed as idle, which includes lands that have been cropped within the past 3 years or are being prepared for crop production. Idle lands have been used to cultivate annual crops such as lettuce, onions, garlic, tomatoes, and melons. The largest acreage of crops with the AOI at Pool 18 was processing tomatoes. Other annual other crops observed were corn, potatoes, alfalfa, and onions, garlic. Permanent crops included pistachios, almonds, peaches, and grapes.

Land use adjacent to Pool 20 in 2020 (**Figure 13**) was primarily almond and pistachio crops. Other permanent crops observed in small acreages were citrus and grapes. The observed annual crops included processing tomatoes, cotton, onions, garlic, leafy greens, and melons. Several idle parcels were also observed adjacent to the SLC.

Land use adjacent to Pool 21 in 2020 (**Figure 14**) was observed mainly as permanent crops, including almonds, pistachios, peaches, and apricots. Other permanent crops observed in small acreages were citrus and grapes. Idle lands were observed on both sides of the SLC and encompassed less than a quarter of the acreage within the Pool 21 AOI. The largest acreage of crops within the AOI of Pool 21 was almonds. Other annual other crops observed were processing tomatoes, cotton, onions/garlic, melons, and grain.

## 5.4 Wildlife Movement/Corridors

Wildlife corridors, habitat corridors or green corridors connect populations of wildlife. These areas allow for movement for migration, hunting, to help prevent negative effects of inbreeding and reduced genetic diversity due to the isolation of populations, and for means of escape from events such as fires or disease.

The SLC runs generally north to south along California's Central Valley. The geographically lateral structure can be considered a link of native habitat adjacent to the SLC. However, due to the open water of the SLC, it can also be considered a restriction of movement or barrier for east to west travel of species. On the western side of the Valley, where there are longer stretches of the SLC without road crossings, the SLC and adjacent lands provide movement and migration opportunities for both aquatic and terrestrial species. Where there are overchutes over the SLC, these offer the ability for wildlife to cross from the east or west side safely. Migratory waterfowl and coastal bird species often use the SLC as a resting area.

## 5.5 Habitats and Natural Communities

After analyzing the vegetation mapping and cross-referencing *A Manual of California Vegetation* (Manual), 21 vegetation alliances were classified within the AOI. From those vegetation alliances, nine habitat types can be distinguished using California Wildlife Habitat Relationships (CWHR) in conjunction with the Manual. Habitat and natural community types present within the AOI include barren, alkali desert scrub, annual grassland, valley foothill riparian, desert riparian, desert scrub, coastal scrub, deciduous orchard, and freshwater emergent wetland (Table 4) (CWHR). Discussion of additional land use types, such as cropland, irrigated row crops, and deciduous orchard can be found in the Land Use section. Habitats and Natural Communities within the AOI are depicted in Figures 15 to 34.

The three most dominant habitat types in the AOI are barren, desert riparian, and annual grassland. The areas within the AOI that are barren are mainly found on the embankment slopes and the shoulder of the SLC paved roads. Along some of the embankment and SLC road shoulders, where the barren habitat ends, annual grassland can be found. Occurrences of desert riparian consists of mesquite thickets and salt cedar that are found at the toe of the embankment and situated between the agricultural land and the SLC embankment within the right-of-way.

**TABLE 4  
VEGETATION ALLIANCES AND HABITAT TYPES WITHIN THE AOI.**

Vegetation Alliance	Acreage of Vegetation Alliances	Associated CWHR Habitat Type	Acreage of CWHR Habitat Type	Description
fiddleneck- filaree fields	72.65	annual grassland	278.69	Characterized by open grasslands composed of annual grasses and forbs. Often occur as an understory to other habitats. Species diversity and structure depends largely on weather patterns and grazing. Great physical differences are characterized between seasons.
wild oats and annual brome grassland	179.86			
red brome or Mediterranean grass grassland	17.93			
tarplant fields	2.1			
upland mustard and other ruderal forbs*	3.02			
sunflower patches*	5.14			
cheeseweed patches*	0.09			
alkali goldenbush scrub*	1.14	alkali desert scrub	15.96	Characterized by open stands of very low to moderately high (0.25-2.0 m; 0.8-6.6 ft) grayish, spinescent, leptophyllous to microphyllous subshrubs and shrubs, which are physically uniform, widely spaced, and occur on relatively dry soils.
quailbush scrub	1.10			
allscale ( <i>Atriplex</i> ) scrub	13.72			
Fremont cottonwood forest	0.19	valley foothill riparian	1.14	Characterized by sloping alluvial fans, slightly dissected terraces, lower foothills, and coastal plains. They are generally associated with low velocity flows, flood plains, and gentle topography. Valleys provide deep alluvial soils and a high water table. Potential evaporation during the warmest months is often greater than precipitation. Low rainfall and streamflow result in water scarcity in many parts of the area.
Willow thickets	0.95			
mulefat-quailbush*	7.7			

Vegetation Alliance	Acreage of Vegetation Alliances	Associated CWHR Habitat Type	Acreage of CWHR Habitat Type	Description
mesquite thickets*	80.71	desert riparian	89.12	Characterized as dense groves of low shrub like trees. These habitats are found adjacent to permanent surface water (e.g., streams, springs) or in naturally subirrigated areas. Usually an abrupt transition occurs between this and adjacent shorter and more open desert habitats.
Palo verde – mesquite forest*	1.173			
tamarisk thickets	7.24			
coyote brush scrub	0.97	coastal scrub	0.97	Characterized by less exposed sites with low to moderate sized shrubs. Dominated by coyote brush. Different species compositions correspond with available moisture. Common species in the mesic region include black sage and California buckwheat.
bladderpod – mesquite – tree tobacco scrub*	12.77	desert scrub	12.77	Characterized as open, scattered assemblages of broadleaved evergreen or deciduous microphyll shrubs. Canopy cover is generally less than 50 percent, usually much less; bare ground is often between plants.
cattail marshes	3.89	fresh emergent wetland	4.05	Characterized by erect, rooted herbaceous hydrophytes. Dominant vegetation is generally perennial monocots to 2 m (6.6 ft) tall. Are flooded frequently, enough so that anaerobic soil conditions occur.
mulefat thickets	0.16			
bare land	197.21	barren	197.21	Characterized by the absence of vegetation. Any habitat with <2% total vegetation cover by herbaceous, desert, or nonwildland species and <10% cover by tree or shrub species is defined this way. May consist of sparse growth, rock, gravel, and soil.

\* Alliances that have sufficient data to propose the vegetation type, but not enough research and regional information to be confident about its status in California's vegetation (California Department of Fish and Wildlife, VegCAMP).

Additional areas on both sides of the SLC contain small patches of alkali desert scrub, desert scrub, and coastal scrub habitat types. The habitat types consist of vegetation alliances with dominant vegetation such as quailbush, allscale, golden bush, coyote brush, and bladder pods (Figures 15, 16, 18, 22-26, and 29).

The WDB contains occurrences of valley foothill riparian consisting of cottonwood and willow dominated landscapes (Figure 27). As described previously, the WDB is used for sediment management and flood control, receiving ephemeral flows from the Arroyo Pasajero. This has encouraged riparian growth however, the alkaline nature of the area and periodic drought conditions, have allowed for patches of desert scrub to become part of the landscape. In addition, in areas where ponding occurs, freshwater emergent habitat dominated by cattail marshes and mulefat can be observed (Figures 23, 26 and 27).

Moving south along both sides of the SLC, portions of the AOI contain small patches of alkali desert scrub, desert scrub, and freshwater emergent wetland habitat types. However, the primary habitat type is annual grassland, dominated by wild oats, annual brome, fiddleneck and filaree (Figures 15-26 and 28-34).

As part of a Memorandum of Understanding (MOU) between the State of California (DWR), CDFW, and Reclamation for the development of wildlife habitat on State Water Project lands adjacent to the SLC, a planting effort was conducted in the late 1960s and early 1970s (DFW Excess Lands; **Figures 35-36**). There are eight parcels that constitute MOU lands within the AOI. The northern section contains the following parcels 124, 132, 134, and 139. These parcels span MP 133 to MP 141 and include one or more of the following dominant vegetation types: mesquite, allscale, bladderpods, and coyote brush (**Figures 15-20, Figure 22-26 and Figures 29 and 32**).

The southern section contains the parcels 168, 171, 176, and 180. These parcels span MP 157 to MP 165. Two of these four parcels (Parcels 168 and 171) can be found north of the intersection of Gale Avenue and the SLC (**Figure 15**) and the remaining two (Parcels 176 and 180) can be found along the SLC at MP 162 (**Figure 29**), and at MP 164.5 (**Figures 30 and 31**). The parcels were managed and monitored by CDFW for the term of the agreement. Parcels 168 and 171 did not receive active plantings but because of flood flows and seed dispersal, native vegetation including willow, cottonwood, and atriplex have established naturally. This naturally established native vegetation currently exists in an undisturbed state. These locations are identified valley foothill riparian and desert scrub habitat. Parcels 176 and 180 no longer show any evidence of native plantings or active habitat management and now consist of annual grassland.

Areas where mesquite thickets are recorded, such as the four planted parcels and narrow strips within the SLC right-of-way, were the direct result of the mitigation efforts by CDFW. Mesquite thicket is a provisional alliance since it is dominated by the Chilean mesquite (*Prosopis chilensis*) and not the honey mesquite (*Prosopis glandulosa*) which is ranked as a sensitive community (NatureServe State Rank S3). This habitat type is considered a sensitive natural community if the mesquite present is classified to the *National Vegetation Classification Standard, Version 2*. Natural Vegetation is defined as vegetation where ecological processes primarily determine species and site characteristics; that is, vegetation comprised of a largely spontaneously growing set of plant species that are shaped by both site and biotic processes (Küchler 1969, Westhoff and Van der Maarel 1973). The mesquite thickets that are present within the AOI are not a result of natural, spontaneous processes and are a result of being planted. These thickets more closely follow the definition of Cultural Vegetation, vegetation with a distinctive structure, composition, and development determined by regular human activity, and do not meet the criteria as a sensitive natural community.

Vegetation alliances such as cattail marshes are associated with freshwater emergent wetland habitat, but in the AOI cattails are highly associated with agriculture ponds and canals that are created to hold and transport agriculture water (**Figures 23 through 26**). These ponds and canals are routinely modified, plowed under and re-established. They are also isolated typically by annual grassland, bare ground, or agriculture. Mulefat thickets are in areas of temporary high levels of saturation caused by large rain events (**Figure 27**).

The provisional alliances documented during vegetation mapping are either a result of the mixture of native vegetation and invasive species or relatively small areas where a common native species is dominant and these provisional alliances should not be considered sensitive.

None of the habitat types and associated alliances that exist in the AOI meet the criteria for sensitive natural communities. The lack of species diversity, acreage, and contiguousness are typical obstacles in the AOI and inhibit habitat ecosystems from flourishing or existing in a natural state. All native vegetation patches, including the past artificially established mitigation parcels, exist as remnant native communities. The mitigation parcels have not been maintained and both plantings and native patches receive encroachment from invasive plants and adjacent landowners. Vandalism such as burning, disking, or dumping trash has been a detriment to vegetation stands as well. Habitat types in the AOI associated with native vegetation stands are often isolated by other habitat such as annual grassland or large areas of bare ground.

The habitat types within the AOI are geographically fragmented and persistently regularly disturbed. The highly disturbed nature of the right-of-way within the AOI can be attributed to introduced non-natives and the routine mowing and spraying that is conducted along the SLC. The high intensity of agricultural land use with routine maintenance of the SLC right of way has removed many of the native vegetation stands and species richness that once existed within the AOI.

## 5.6 General Wildlife

The SLC and adjacent lands also provide a place where many common wildlife species live, breed, and forage. Species diversity in the area is impacted by both natural and human influences such as climate, poaching, habitat encroachment, land use changes, and maintenance activities.

**Table 5** lists wildlife observed within the AOI since 2015.

**TABLE 5  
GENERAL WILDLIFE OBSERVED IN THE AOI.**

Common Name	Scientific Name
<b>Reptile and Amphibian</b>	
western toad	<i>Anaxyrus boreas</i>
chorus frog	<i>Pseudacris sierrae</i>
western side blotch lizard	<i>Uta stansburiana</i>
<b>Bird</b>	
grebe	<i>Podiceps ssp.</i>
great blue heron	<i>Ardea herodias</i>
great white egret	<i>Ardea alba</i>
double crested cormorant	<i>Phalacrocorax auritus</i>
red-tailed hawk	<i>Buteo jamaicensis</i>
Cooper's hawk	<i>Accipiter cooperii</i>
turkey vulture	<i>Cathartes aura</i>
lesser scaup	<i>Aythya affinis</i>
bufflehead	<i>Bucephala albeola</i>
mallard	<i>Anas platyrhynchos</i>
merlin	<i>Falco columbarius</i>

Common Name	Scientific Name
American coot	<i>Fulica americana</i>
killdeer	<i>Charadrius vociferus</i>
black-necked stilt	<i>Himantopus mexicanus</i>
greater yellowlegs	<i>Tringa melanoleuca</i>
mourning dove	<i>Zenaida macroura</i>
Eurasian collard dove	<i>Streptopelia decaocto</i>
barn owl	<i>Tyto alba</i>
great horned owl	<i>Bubo virginianus</i>
western kingbird	<i>Tyrannus verticalis</i>
California scrub jay	<i>Aphelocoma californica</i>
common raven	<i>Corvus corax</i>
American crow	<i>Corvus brachyrhynchos</i>
tree swallow	<i>Tachycineta bicolor</i>
cliff swallow	<i>Petrochelidon pyrrhonota</i>
barn swallow	<i>Hirundo rustica</i>
mockingbird	<i>Mimus polyglottos</i>
European starling	<i>Sturnus vulgaris</i>
yellow rumped warbler	<i>Setophaga coronata</i>
white crowned sparrow	<i>Zonotrichia leucophrys</i>
red-winged blackbird	<i>Agelaius phoeniceus</i>
western meadow lark	<i>Sturnella neglecta</i>
Brewer's blackbird	<i>Euphagus cyanocephalus</i>
house finch	<i>Haemorhous mexicanus</i>
house sparrow	<i>Passer domesticus</i>
<b>Mammal</b>	
cotton tail	<i>Sylvilagus audubonii</i>
black tailed jackrabbit	<i>Lepus californicus</i>
California ground squirrel	<i>Otospermophilus beecheyi</i>
Heermann's kangaroo rat	<i>Dipodomys heermanni</i>
California vole	<i>Microtus californicus</i>
red fox	<i>Vulpes vulpes</i>
gray fox	<i>Urocyon cinereoargenteus</i>
coyote	<i>Canis latrans</i>
feral pig	<i>Sus scrofa</i>
mule deer	<i>Odocoileus hemionus</i>

## 6.0 Special-status Species Results

Special-status species include plants and wildlife that have been designated as special concern, rare, threatened, or endangered under the Federal Endangered Species Act (FESA) or California Endangered Species Act (CESA). Species become listed due to loss of habitat, declining populations, and changes in climate.

Species may also be considered to be rare or endangered under the conditions of Section 15380 of the California Environmental Quality Act Guidelines, such as those identified on lists 1A, 1B, and 2 in the 2019 *Inventory of Rare and Endangered Plants of California* by the California Native Plant Society (CNPS).

Potential to occur for special-status species as assessed as low, medium or high. The low, medium, or high potential for a particular species to occur in the project area is based on the following criteria:

- **None:** The project area and/or immediate vicinity do not provide habitat for a particular species. In addition, the survey area may lie outside the known range for a particular species and/or no known locations of this species occurs within the vicinity of the AOI.
- **Low Potential:** The project area and/or immediate vicinity only provide limited habitat for a particular species. In addition, the survey area may lie outside the known range for a particular species and/or no known locations of this species occurs within the vicinity of the AOI.
- **Medium Potential:** The project area and/or immediate vicinity provide suitable habitat for a particular species and/or known locations of this species occurs within the vicinity of the AOI.
- **High Potential:** The project area and/or immediate vicinity provide high-quality or ideal habitat (i.e., soils, vegetation assemblage, and topography) for a particular species and/or known locations of this species occurs within the vicinity of the AOI.

### 6.1 Special-status Plants

As discussed in Section 5.5, most of the plants within the right of way are invasive non-natives. The high intensity of agricultural land use and routine maintenance of the SLC right of way has removed many of the habitat types and habitat that once existed within the AOI. No plants found in the literature review have critical habitat designations. The following special status plants in **Table 6** have low to medium probability of occurrence.

**TABLE 6  
SPECIAL STATUS PLANTS RECORDED NEAR THE AOI; CNDDDB, CNPS, AND THE IPAC.**

Scientific Name	Common Name	Status	Habitat	Probability of Occurrence
<b>Plants</b>				
<i>Atriplex cordulata</i>	Heartscale	1B.2	Native and endemic to California. Annual herb found in chenopod scrub, meadows and seeps, and valley and foothill grasslands with saline or alkaline soils.	Low. Valley grassland habitat is present, but lacks alkaline soils. No detections of the species during surveys or occurrences recorded on CNDDDB with 3 miles of AOI.
<i>Caulanthus californicus</i>	California Jewel Flower	FE/SE/1B.1	Native and endemic to California. Annual herb found in shadscale scrub, valley grassland, pinyon-juniper woodland.	Low. Valley grassland habitat is present. No detections of the species during surveys or occurrences recorded on CNDDDB with 3 miles of AOI.
<i>Eryngium spinosepalum</i>	Spiny-sepaled button-celery	1B.2	Native and endemic to California. Annual or perineal herb. Usually found in grassland, riparian wetland, and wetlands, occasionally found in non-wetlands.	Low. Valley grassland habitat is present, but lack available wetlands. No detections of the species during surveys or occurrences recorded on CNDDDB with 3 miles of AOI.
<i>Layia munzii</i>	Munz's tidy-tips	1B.2	Native and endemic to California. Usually found in valley grassland, shadscale scrub, and wetland-riparian habitats.	Low. Valley grassland habitat is present, but lack available wetlands. No detections of the species during surveys or occurrences recorded on CNDDDB with 3 miles of AOI.
<i>Lepidium jaredii album</i>	Panoche pepper-grass	1B.2	Native and endemic to California. Usually found in valley grassland habitat.	Medium. Valley grassland habitat is present. No detections of the species during surveys or occurrences recorded on CNDDDB with 3 miles of AOI.
<i>Monolopia congdonii</i>	San Joaquin woollythreads	1B.2	Native and endemic to California. Usually found in valley grassland, shadscale scrub, and wetland, occasionally non-wetland.	Low. Valley grassland habitat is present, but lack available wetlands. No detections of the species during surveys or occurrences recorded on CNDDDB with 3 miles of AOI.

FE = Federally Endangered; SE= California Endangered; FT = Federally Threatened; ST= California Threatened; 1B.1= Plants Seriously Rare or Endangered in California; 1B.2 = Plants Rare, Threatened, or Endangered in California and Elsewhere

## 6.2 Special-Status Wildlife

**Table 7** lists special-status wildlife species that have the potential to occur within the AOI based on literature reviews, field survey observations, or the presence of suitable habitat. Documented occurrences of special-status species are illustrated in **Figures 15 through 34**.

**TABLE 7**  
**SPECIAL STATUS WILDLIFE SPECIES RECORDED WITHIN THE AOI; CNDDDB AND THE IPAC.**

Scientific Name	Common Name	Status	Habitat	Probability of Occurrence
<b>Invertebrates</b>				
<i>Bombus crotchii</i>	Crotch bumble bee	Candidate SE	Found historically across the whole central valley. Can be found foraging in grasslands and pollenating any available blooms. During wintering can be found living underground.	Medium. Suitable habitat is available in the AOI. The species has not been detected during surveys. There is one recorded occurrence within 3 miles on CNDDDB.
<i>Branchinecta lynchi</i>	*Vernal pool fairy shrimp	FT	Ephemeral freshwater habitats, including alkaline pools, clay flats, vernal pools, vernal lakes, vernal swales, and other types of seasonal wetlands.	None. Suitable habitat is not present in the AOI. No recorded detections within 3 miles on CNDDDB.
<b>Fish</b>				
<i>Hypomesus transpacificus</i>	Delta smelt	FT/SE	The upper Sacramento-San Joaquin Delta of California.	None. Suitable habitat is not present in the AOI. No recorded detections within 3 miles on CNDDDB.
<b>Amphibians</b>				
<i>Ambystoma californiense</i>	California tiger salamander	FT/SE	Restricted to grasslands and low foothills with pools or ponds that are necessary for breeding.	None. Although marginal upland habitat is present, no breeding habitat is identified within the AOI. There are no recorded detections of the species within 3 miles on CNDDDB.
<i>Spea hammondi</i>	Western spadefoot	SSC	Found in lowland habitats such as washed, floodplains, alluvial fans, and alkali flats. Prefer areas of open vegetation and short grasses in sandy or gravelly soils.	Present. Suitable habitat is present within the AOI. Temporary stands of water from storms or ag runoff is present from year to year. The species has been detected during surveys and there are recorded occurrences within 3 miles on CNDDDB.
<i>Rana draytonii</i>	California red-legged frog	FT/SSC	Annual grassland and grassy understory of valley-foothill hardwood habitats in central and northern California. Needs underground refuges and vernal pools or other seasonal water sources.	None. Although marginal grassland habitat is present there is no suitable water sources in the AOI. There are no recorded detections of the species within 3 miles on CNDDDB.
<b>Reptiles</b>				
<i>Actinemys marmorata</i>	Western pond turtle	SSC	Found in ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Requires basking sites and suitable upland habitat for egg-laying. Nest sites most often characterized as having gentle slopes (<15%) with little vegetation or sandy banks.	Low. Suitable habitat is present within the AOI. The species has not been detected during surveys. There are no recorded occurrences documented in CNDDDB within 3 miles of the AOI.

Scientific Name	Common Name	Status	Habitat	Probability of Occurrence
<i>Anniella pulchra</i>	Northern California legless lizard	SSC	Found in the San Joaquin Valley in loose soils with moisture. Prefer habitat being coastal suggest they prefer sandy soils.	Low. Sparse marginal habitat is present within the AOI. The species has not been detected during surveys. One recorded occurrence has been documented in CNDDDB within 3 miles of the AOI.
<i>Gambelia sila</i>	*Blunt-nosed leopard lizard	FE/SE	Found in semiarid grasslands, alkali flats, and washes. Prefers flat areas with open space for running, avoiding densely vegetated areas.	Low. Marginal habitat is present within the AOI. The species has not been detected during surveys. There are no recorded occurrences post the 1970s documented in the CNDDDB within 3 miles of the AOI.
<i>Arizona elegans occidentalis</i>	California glossy snake	SSC	Most common in desert habitats, also found in arid scrub, rocky washes, grasslands, and chaparral. Prefers open areas and areas with loose soils for burrowing. Spends the day and winter in mammal burrows and rock outcrops.	Low. Marginal habitat is present within the AOI. The species has not been detected during surveys. There are no recorded occurrences documented in CNDDDB within 3 miles of the AOI.
<i>Coluber flagellum ruddocki</i>	San Joaquin coachwhip	SSC	Open arid grassland and scrub areas.	Present. Suitable habitat is present within the AOI. The species has been detected within the AOI and north of the AOI during surveys. There are no recorded occurrences documented in CNDDDB within 3 miles of the AOI.

**Birds**

<i>Falco mexicanus</i>	Prairie falcon	BCC	Found in annual grasslands to alpine meadows, but associated primarily with perennial grasslands, savannahs, rangeland, some agricultural fields, and desert scrub areas.	Present. Suitable habitat is present within the AOI. Detections have been made during surveys, however, there are no recorded occurrences within 3 miles on CNDDDB.
<i>Falco columbarius</i>	Merlin	BCC	Found in shrubs and trees along rivers and in small groves of deciduous trees. Use grasslands as foraging during migration.	High. Suitable habitat is present within the AOI. This species has been observed during surveys adjacent to the AOI (between Pools 18 and 20) and there are recorded occurrences within 3 miles on CNDDDB.
<i>Aquila chrysaetos</i>	*Golden eagle	FP	Found in a variety of habitats including shrublands, grasslands, farmland, and areas along rivers and streams. Prefer partially or completely open country, especially around mountains, hills, and cliffs.	Low. Only foraging habitat is present in the AOI. The species has not been detected during surveys. There are no recorded occurrences documented in CNDDDB within 3 miles of the AOI.

Scientific Name	Common Name	Status	Habitat	Probability of Occurrence
<i>Buteo swainsoni</i>	Swainson's hawk	ST	Forages in open and agricultural fields and nests in mature trees usually in riparian corridors.	Present. Foraging and breeding habitat, where suitable nest sites occur, are present within the AOI. This species has been observed during past surveys and documented in the CNDDB.
<i>Elanus leucurus</i>	*White-tailed kite	FP	Found year-round in coastal and valley lowlands; rarely found away from agricultural areas. Inhabits herbaceous and open stages of most habitats mostly in cismontane California.	Present. Suitable habitat is present within the AOI. Historic detections have been made during surveys, however, there are no recorded occurrences within 3 miles on CNDDB.
<i>Circus cyaneus</i>	Northern harrier	SSC	Nests in wet meadows and tall grasslands, forages in grasslands and marshes.	Present. Foraging and breeding habitat are present within the AOI. This species has been observed during past surveys and documented in the CNDDB.
<i>Gymnogyps californianus</i>	California condor	FE	Grassland, chaparral, oak savannah, and coniferous forests. Large trees or cliff faces are required for nesting.	None. Grassland is the only suitable habitat present and there are no nesting opportunities in located in the AOI. There are no recorded occurrences of this species within 3 miles on CNDDB.
<i>Charadrius montanus</i>	Mountain plover	BCC	Found in shortgrass prairies and in high, open, semidesert habitats. It prefers arid areas. Winters in agricultural habitats, prairies, and alkaline flats.	Low. Only wintering habitat is present in the AOI. The species has not been detected during surveys. There are no recorded occurrences documented in CNDDB within 3 miles of the AOI.
<i>Numenius americanus</i>	Long-billed curlew	SSC	Found in lowland areas near agriculture in the interior of California. Central and Imperial valley are important areas for wintering and migrating.	Present. Suitable habitat is present within the AOI. Historic detections have been made during surveys, however, there are no recorded occurrences within 3 miles on CNDDB.
<i>Asio flammeus</i>	Short-eared owl	SSC	Found in prairies, grasslands, meadows and agricultural areas. Prefer large, open areas with low vegetation.	Medium. Suitable habitat is in the AOI, but no detections have been made during surveys. One recorded occurrence was documented in CNDDB approximately 3 miles from the northern end of the area.
<i>Athene cunicularia</i>	Burrowing owl	SSC	Found in open grasslands with low vegetation, golf courses, and disturbed/ruderal habitat in urban areas.	Present. Foraging and breeding habitat are present within the AOI. This species has been observed during past surveys and documented in the CNDDB.
<i>Lanius ludovicianus</i>	Loggerhead shrike	SSC	Inhabits a variety of woodland and open grassland habitats throughout California.	Present. Suitable habitat is present within the AOI. Detections have been made during surveys and there are recorded occurrences within 3 miles on CNDDB.

Scientific Name	Common Name	Status	Habitat	Probability of Occurrence
<i>Eremophila alpestris actia</i>	California horned lark	WL	Found in prairies and heavily grazed pastures. Prefer bare, dry ground and areas of short, sparse vegetation.	Present. Suitable habitat is present within the AOI. This species has been observed during surveys. There are no recorded occurrences within 3 miles on CNDDB.
<i>Agelaius tricolor</i>	Tricolored blackbird	ST	Largely endemic to California, most numerous in the Central Valley and nearby vicinity. Typically requires open water, protected nesting substrate, and foraging grounds within vicinity of the nesting colony. Nests in dense thickets of cattails, tules, willow, blackberry, wild rose, and other tall herbs near fresh water. Also nests in agricultural crops (e.g., silage), where colonies are threatened during harvest.	High. Suitable nesting habitat is sparse for the species. However, this species directly adjacent to the AOI and recorded observations are documented on CNDDB.
<i>Xanthocephalus xanthocephalus</i>	Yellow-headed blackbird	SSC	Nests in shrubs near freshwater marshes or reedy lakes; during migration and winter, prefers open cultivated lands, fields, and pastures.	Present. Suitable nesting habitat is sparse in the AOI. However, historic detections have been made during surveys and recorded on CNDDB.

**Mammal**

<i>Ammospermophilus nelsoni</i>	San Joaquin antelope squirrel	ST	Found in relatively arid annual grassland and shrubland communities. Prefer areas with a sparse-to-moderate cover of shrubs such as saltbushes.	None. Marginally suitable habitat is present within the AOI, however this species is considered likely extirpated from the AOI and its current range occurs south of the AOI. Three recorded occurrences from CNDDB pre-date 1952.
<i>Dipodomys nitratoides exilis</i>	Fresno kangaroo rat	FE/SE	Prefer areas of grassland and alkali desert scrub on the San Joaquin Valley floor. Recently they have been found only in alkali sink communities from 200 to 300 feet in elevation.	None. Suitable habitat is not present within the AOI. The species has not been detected during surveys. There are no recorded occurrences documented in CNDDB within 3 miles of the AOI.
<i>Dipodomys ingens</i>	Giant kangaroo rat	FE/SE	Prefers arid, often strongly alkaline, flat plains with sparse vegetation of grasses and alkali forbs.	Low. Although recorded occurrences are documented 3 miles west of the area, suitable habitat is not present within the AOI.
<i>Onychomys torridus</i>	Tulare grasshopper mouse	SSC	Found in arid shrubland communities in hot, arid grassland and shrubland associations, such as saltbush scrub.	None. Suitable habitat is not present within the AOI. The species has not been detected during surveys. There are no recorded occurrences documented in CNDDB within 3 miles of the AOI.

Scientific Name	Common Name	Status	Habitat	Probability of Occurrence
<i>Vulpes macrotis mutica</i>	San Joaquin kit fox	FE/ST	Grassland or grassy open stages with scattered shrubby vegetation; requires loose textured sandy soils for burrowing; requires suitable prey base of small rodents.	Medium. Suitable habitat is present within the AOI. Detections have not been made during surveys but has been documented as a corridor for the species. There are recorded occurrences within 3 miles on CNDDB.
<i>Taxidea taxus</i>	American badger	SSC	Found in dry, open grasslands, fields, and pastures. Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils.	High. Suitable habitat is present within the AOI. This species has been observed north of the AOI and recorded observations are documented on CNDDB.

Special status species observed within the AOI during any of the field include the following: western spadefoot, San Joaquin coachwhip, burrowing owl, Swainson's hawk, northern harrier, prairie falcon, horned lark, white-tailed kite, yellow-headed blackbird and loggerhead shrike, yellow headed blackbird, white-tailed kite, and long-billed curlew.

Western spadefoot has also been documented in the WDB. Tadpoles and adult toads have been observed in puddles during years of high rainfall and where large pooling of water occurs.

Burrowing owl is one of the most consistently observed special status species throughout the Project area. Since 2015, 45 detections have been made in the AOI. Agricultural fields within the AOI provide cover and food for small mammals, providing a prey source for the BUOW. Numerous ground squirrel burrows and canid dens large enough for BUOW occupation exist on the SLC embankment. The owls utilize the SLC embankment and atypical burrows such as irrigation pipes, culverts, etc. for burrowing opportunities. During the 2016 surveys a minimum of 13 occupied burrows were observed within a 13-mile stretch of the AOI associated with Pools 17 and 18. At least four others within the 13-mile stretch had BUOW sign. In 2019, a minimum of six occupied burrows were observed. During February and October 2019 surveys of Pools 20 and 21, three confirmed occupied burrows were observed within the AOI, and six other burrows had BUOW sign.

Northern harrier is also commonly observed throughout this area. Annual grassland provides nesting and foraging habitat for the species, as well as the adjacent agricultural fields and fallowed lands. Approximately 43 sightings have been recorded in the AOI from 2015 through 2019. Nesting sites were not identified due to their inconspicuous placement.

Swainson's hawks can be observed throughout the Central Valley during the spring and summer and are documented within the AOI. The species depends on annual grasslands and agricultural fields for foraging. However, the species requires structures or trees for nesting opportunities. In the AOI there are single or small stands of trees spread amongst the agricultural fields and occasionally a structure or homestead with shade trees to provide nesting. Approximately 22 active nest sites have been detected since 2015 within the AOI. During the course of protocol level surveys, 11 nest sites were documented as successful: offspring were monitored and

recorded until fledged. The additional 11 nest sites are nests that have been observed with parent and offspring during general surveys but were not monitored through fledging to confirm success. Most active nests observed in the AOI have been located in available trees such as eucalyptus and large mesquite stands.

Other special status bird species observed in the area include white-tailed kite, prairie falcon, and loggerhead shrike. Foraging and breeding habitat is available to all three species within the AOI. Approximately four sightings of each of the species has been recorded throughout 2016 to 2020. Other nesting bird species observed within the past five years in the AOI include red-tailed hawk, great horned owl, greater road runner, and American crow.

Canid dens and small mammal burrows have been observed within the AOI and SLC embankment. Although small mammal burrow density surveys have not been conducted, the presence of large clusters or complexes have been observed throughout the AOI. In addition, California ground squirrel are regularly observed and are known to forage in adjacent orchards and this small mammal provides a source of prey for local canids. Den and medium-sized burrow surveys were conducted in 2019 within Pools 20 and 21 and in 2020 within Pools 17 and 18, a total of 42 potential dens were documented (**Table 8**).

**TABLE 8  
SURVEY RESULTS OF DENS AND BURROW LOCATIONS**

Milepost	Den	Pool
123.26 Right (R)	No Sign of Use	17
123.26 R	Canid Scat	17
124.79 R	No Sign of Use	17
126.72 R	No Sign of Use	17
127.28 R	No Sign of Use	17
128.34 R	No Sign of Use	17
128.34 R	Canid Scat	17
129.40 Left (L)	No Sign of Use	17
134.19 R	No Sign of Use	18
136.44 L	No Sign of Use	18
136.91 R	No Sign of Use	18
136.91 R	Canid Scat	18
136.95 R	No Sign of Use	18
137.36 R	No Sign of Use	18
137.47 R	No Sign of Use	18
137.52 L	No Sign of Use	18
137.54 R	BUOW Sign	18
137.54 R	BUOW Sign	18
137.63 R	BUOW Sign	18
137.67 R	BUOW Sign	18
139.95 L	No Sign of Use	18

Milepost	Den	Pool
141.13 R	No Sign of Use	18
141.25 L	No Sign of Use	18
155.69L	Coyote	20
155.70L	Coyote	20
156.56L	Coyote	20
158.77L	Coyote	20
159.08R	Coyote	20
159.20L	Coyote	20
159.40L	Coyote	20
159.81L	Coyote	20
161.68L	Coyote	20
161.69L	Coyote	20
161.95L	Burrowing Owl	20
162.01L	Burrowing Owl	20
162.12L	Coyote	20
162.44L	Coyote	20
162.62L	Burrowing Owl	20
162.73L	Burrowing Owl	20
162.81L	Burrowing Owl	20
162.95L	Burrowing Owl	20
163.04L	Coyote	20
163.23L	Burrowing Owl	20
163.24R	Coyote	20
163.36L	Coyote	20
163.39L	Coyote	20
164.20L	Burrowing Owl	21
166.06R	Burrowing Owl	21
167.93L	Coyote	21
168.23L	Coyote	21

Of those associated with Pools 17 and 18, 18 dens had no signs of use, three dens had canid scat nearby and four dens had signs of burrowing owl use. Of those associated with Pools 20 and 21, some canid dens had signs such as fecal droppings, small mammal remains, paw prints, entrance exceeding 6 inches, a large earthen mound in front of entrance, or claw marks along the sides of the den. Canid scat observed was typical of coyote or dog based on sizing. No other evidence such as prints, scratch marks, or typical San Joaquin kit fox or American badger evidence was observed. Signs of burrowing owl usage can consist of burrowing owl present, whitewash, owl pellets, feathers, and insect parts. Thirteen burrows had evidence of one or more of these signs. See **Figures 37 through 46** for locations of burrows and dens in proximity to geotechnical drill sites.

## 7.0 Impact Analysis

This section considers potential impacts to sensitive biological resources due to the implementation of the proposed Project. Both potential direct and indirect impacts were analyzed based on the changes to existing conditions by Project actions. It should be noted that a majority of the proposed boring locations occur along the roadways located along the top of the canal, though some boring locations do occur within fallow fields, nut orchards or adjacent to trees and other potential structures suitable to support nesting raptors and other migratory birds. Boring activities are anticipated to be temporary and intermittent, with approximately 6 drill holes to be completed in each day. The duration of each boring activity is anticipated to be hours, rather than days.

### 7.1 Sensitive Natural Communities

Valley foothill riparian, desert riparian and fresh emergent wetland were identified in the AOI; however, geotechnical boring locations have been located to avoid sensitive natural communities. No sensitive natural communities were located within the area of direct impact and project-related activities will not result in direct adverse impacts.

### 7.2 Special-status Plants

Although no special-status plants are known to occur within the AOI, special status plants have a potential to occur. These special-status plant species include: heartscale (*Atriplex cordulata*), California Jewel Flower (*Caulanthus californicus*), spiny-sepaled button-celery (*Eryngium spinosepalum*), Munz's tidy-tips (*Layia munzii*), Panoche pepper-grass (*Lepidium jaredii album*), and San Joaquin woollythreads (*Monolopia congdonii*). Project-related activities have the potential to impact special-status plant species if present within the footprint of the geotechnical borings through the removal of plants and their habitat. Project-related activities have the potential to facilitate an increase in the disturbance and abundance of invasive plants by directly transporting invasive seed sources on site (and between sites) via equipment and by creating ideal seed beds through ground disturbance and resulting bare soils. However, the drilling equipment would largely remain on established roads, and the risk of propagation of invasive plant species is low. Implementation of biological monitoring required in **Measures BIO-1** and **BIO-4** will ensure that special status plant species are identified and avoided by the drilling operations.

### 7.3 Special-status Wildlife

#### Reptiles, Amphibians, and Invertebrates

**Table 7** lists the San Joaquin coachwhip known to occur and other special status reptiles that have the potential to occur within the AOI. Although potential to occur is low for the remaining species, ground disturbance could impact individuals. Implementation of **Measures BIO-1** and **BIO-4** would ensure that the activity areas near sensitive resources would be cleared of wildlife prior to project activities each working day, avoiding impacts to reptile species. No permanent loss of habitat would occur.

The WDB has been surveyed annually for BNLL for over 20 years. No BNLL have been detected. Although the species may travel along the channel as a corridor, from upstream habitat in the surrounding hills to the valley portions downstream, the project work areas are not expected to support the species. **Measures BIO-1 and BIO-4** would ensure that any individual lizards are flushed from the work area each morning. As a result, the temporary drilling activities would avoid the potential for impacting BNLL.

Western spadefoot toad and San Joaquin coachwhip are known to occur in the area. The temporary geotechnical activities could encounter individuals. Implementation of **Measures BIO-1 and BIO-4** would ensure that the activity areas including the site access and drilling locations would be cleared of wildlife during Project activities, avoiding impacts to the species.

Since no habitat would be removed as part of the Project, impacts to crotch bumble bee are not anticipated.

Potential indirect impacts to amphibians and reptiles such as trash, vehicular collision with construction equipment between boring locations, nighttime lighting, and wildlife being trapped in open holes will be avoided and minimized with implementation of **Measures BIO-5 through BIO-8**.

## Avian Species

Project-related activities have the potential to impact raptors and other nesting birds that may occur in the area including prairie falcon, merlin, Swainson's hawk, northern harrier, white-tailed kite, and golden eagle (foraging). Each of these species is either known to occur within the AOI or has potential based on available habitat. Breeding and nesting behavior may be impacted if nests are located near geotechnical investigation-activities due to noise and equipment traffic (potentially causing adult abandonment of the nest, eggs or young to be crushed, and/or reproductive failure). The nesting season extends from February 15 through September 1 (SHTAC 2000). No occupied nest trees will be removed within the proposed footprint for geotechnical borings or boring activities. Geotechnical investigation activities could also temporarily disturb foraging habitat (e.g., annual and perennial grasslands, cropland). However, due to the limited time that activities would be conducted within foraging areas, impacts to foraging behavior are not expected. Implementation of **Measures BIO-1 and BIO-3** would require that nesting bird surveys are conducted within the work areas prior to project activities. If bird nests are observed, the monitor would establish an appropriate buffer between the raptor nests and the work area. As a result, impacts to nesting raptors would be avoided.

Passerine birds and other special status avian species that may nest in vegetation in close proximity to the geotechnical activities also may be affected. Implementation of **Measure BIO-3** would ensure that potential impacts would be minimized through the establishment of buffer areas.

Burrowing owls are common within the AOI. Project-related activities have the potential to impact occupied burrowing owl burrows. If any active burrows occur in the vicinity of the boring locations nesting behavior could be disturbed as a result of noise and traffic (potentially causing adult abandonment of the nest, eggs or young to be crushed, and/or reproductive failure) or by removing destroying burrows. Since the Project would only involve temporary work activity in the vicinity of habitat, long-term displacement or loss of habitat would not occur. **Measure BIO-1** would require pre-activity surveys of the work areas. If needed, **Measure BIO-3** would ensure each drilling location would be modified by the biological monitor to ensure avoidance of burrowing owl burrows. As a result, impacts to burrowing owls would be avoided.

Potential indirect impacts to birds such as trash, vehicular collision with construction equipment between boring locations, nighttime lighting, and wildlife being trapped in open holes will be avoided and minimized with implementation of **Measures BIO-5 through BIO-8**.

## Mammals

Canid dens, medium burrows, and small mammal burrows have been observed within the AOI. Project-related activities have the potential to impact San Joaquin kit fox or American badger's use of the area as a corridor as a result of the geotechnical boring noise and equipment traffic. The potential for special status rodent species to occur in the project area is low. Although there is potential for giant kangaroo rat to be present, no occurrences have been documented within the AOI and no sign of giant kangaroo rat were detected at burrows during previous burrow and den surveys. **Measure BIO-1** would require pre-activity surveys of the work areas to identify sensitive resources and **Measure BIO-4** would require monitoring during drilling near identified sensitive resources. The location of each drilling site would be modified by the biological monitor to ensure avoidance of canid burrows. As a result, impacts to mammals would be avoided.

Potential indirect impacts to mammals such as trash, vehicular collision with construction equipment between boring locations, nighttime lighting, and wildlife being trapped in open holes will be avoided and minimized with implementation of **Measures BIO-5 through BIO-8**.

Within the AOI there are 17 bridges that cross the SLC (**Table 9**). Bridges are known to be possible roosting sites for bats. Although no special status bat species have been documented in the area it does not preclude their presence. Past projects have documented bats roosting in bridges or swallow nests on the bridges. There is the potential for bats to use these bridges as temporary roost as they migrate through. Project-related activities have the potential to impact special status bat species if any roosts occur in the vicinity of the geotechnical borings footprint by disturbing species' behavior as a result of noise and traffic (potentially causing adult abandonment of the roost and/or reproductive failure). Since the bridges would not be directly affected during the geotechnical investigations, potential impacts to bats and swallows would be similar to other activities using the bridge, including normal traffic. As a result, impacts to nesting bats and swallows would be avoided.

**TABLE 9  
BRIDGES CROSSING SLC WITHIN AOI.**

<b>Bridges</b>	<b>Milepost</b>	<b>Pool</b>
San Diego Avenue	121.97	17
Highway 33 Bridge/Derrick Avenue	125.31	17
Clarkson Avenue	128.50	17
San Mateo Avenue	130.81	17
Cerini Avenue	132.77	17
Mt. Whitney Avenue	134.90	18
Excelsior Avenue/Parkhurst Avenue	137.06	18
Jeffrey Avenue	139.35	18
Oakland Avenue	141.57	18
Highway 145/Fresno-Coalinga Avenue	143.12	18
Railroad Bridge	155.78	20
Gale Avenue	158.45	20
Jayne Avenue	161.57	20
Avenal Cutoff Road	164.40	20
Plymouth Avenue	167.36	21
30th Avenue	169.40	21
Quail Avenue	170.42	21

## 7.4 Critical Habitat

Critical habitat boundaries were retrieved from each species' respective Environmental Conservation Online System (ECOS) species profile page (USFWS, 2018). Of the special-status species identified in **Table 7**, only six had critical habitat designations associated with them and were near enough to the AOI to be identified by IPaC database. Species with critical habitat designations include California condor, California red-legged frog, California tiger salamander, delta smelt, Fresno kangaroo rat, and vernal pool fairy shrimp. The species with the closest designated critical habitat was the Fresno kangaroo rat, at over 10 miles north-east of the AOI, however the area between the Project and critical habitat is dominated by permanent agricultural lands with no connecting wildlife corridors. The next closest species is the vernal pool fairy shrimp, at over 20 miles west of the AOI and also separated by permanent agricultural lands and the geography of the coastal range.

## 8.0 Avoidance and Minimization Measures

Potential impacts would be avoided and minimized through implementation of recommended measures provided below:

**Measure BIO 1 Pre-Activity Surveys:** A qualified biologist shall conduct pre-activity surveys of each drilling site and off-road access route within 30 days of initiation of project activities. The

pre-activity assessment surveys of the work area will identify and flag special-status wildlife resources including canid dens, special-status plants, and nesting birds for avoidance.

Prior to initiation of work activities in sensitive resources, the qualified biological monitor shall survey the drilling activity area for any wildlife to ensure individuals are allowed to move out of harm's way. No nests or dens will be removed or otherwise affected.

**Measure BIO 2 Environmental Awareness Training:** Prior to work beginning, a Worker Environmental Awareness Program (WEAP) training will be conducted for construction personnel by a qualified biologist. The WEAP training will focus on special-status resources known to occur within the AOI, as well as measures required to avoid impacts to these resources.

**Measure BIO 3 Bird Nest Avoidance:** For areas where there are known raptor nests or burrowing owls within 250 feet of the access road and drilling locations, work will be scheduled prior to the nesting season, as feasible.

If project-related activities are scheduled during the nesting season (typically February 1 to August 31), focused nest surveys of affected work areas shall be conducted by a qualified biologist within two weeks prior to the beginning of work activities for ground, canopy or man-made structure nesters. The qualified biologist shall survey the area for nests within a minimum of 250-foot radius around project activities.

If the survey identifies an active nest, the qualified biologist shall flag the location and coordinate with construction personnel to modify boring locations to an area outside of a buffer as determined by the qualified biologist in the field. The buffer shall be delineated and shall be in effect throughout construction (for each boring location this should be less than one day) or until the nest is no longer active (i.e., the young are no longer being fed by their parent(s)). The buffer(s) shall be determined based upon the life history of the individual species, including their sensitivity to noise, vibration, ambient levels of human activity and general disturbance, the current site conditions (screening vegetation, terrain, etc.) and the various project-related activities necessary to implement the project. The qualified biologist shall be onsite during the initiation of project activities and if there is a change in the level of activity (i.e., noise level, etc.) to monitor the nest. The buffer between the construction activities and the active nest will ensure that nesting activities are not interrupted.

If no active nests are found, project activities may proceed without modification.

**Measure BIO 4 Drilling Location Survey and Avoidance:** During boring activities near sensitive resources, a qualified biological monitor will accompany drilling teams at each drilling location. If dens, burrows, or sensitive vegetation are present within the work area, the qualified biologist will coordinate with construction personnel to modify boring locations or off-road access routes to avoid these features. A buffer between potentially active canid dens or potential special-status small mammal burrows and the active work area shall be no less than 50 feet.

The biological monitor shall have the authority to approve drilling locations and off-road access routes and to halt construction activities if special status species are present. The monitor will maintain an electronic log of survey results and drilling location modifications resulting from monitoring activities.

**Measure BIO 5 – Vehicle Speed Limit:** Except on Federal, State, or County roadways, work-related vehicles will adhere to a speed limit of 15 miles per hour. Vehicular traffic to and from the project site shall use existing routes of travel. Cross country vehicle and equipment use outside designated work areas shall be prohibited. Access roads that are planned for use during construction shall not extend beyond the planned impact area. All vehicle traffic shall be contained within the planned impact area or in previously disturbed areas.

**Measure BIO 6 – Timing of Work:** Nighttime work will be avoided to avoid active periods of species such as the San Joaquin kit fox.

**Measure BIO 7 – Open Holes:** Any unfilled holes that may need to be left overnight will be covered and weighted to prevent animals from becoming trapped inside.

**Measure BIO 8 – Trash:** Any food scraps or other trash items will be stored in wildlife-proof containers and removed offsite, as needed to avoid attracting any special-status species or their predators (i.e., common ravens, coyotes, or feral dogs) to the work areas.

## 9.0 Conclusions

Burrowing owl, Swainson’s hawk, northern harrier, prairie falcon, and loggerhead shrike were identified in the AOI. No sensitive plants have been identified.

As noted in **Table 7**, the Project footprint may support fourteen additional special status wildlife species that may use the area for foraging, movement, or breeding, including the following: Crotch bumble bee, western spadefoot, San Joaquin coachwhip, long-billed curlew, merlin, short-eared owl, white-tailed kite, California horned lark, tri-colored blackbird, yellow-headed blackbird, Western mastiff bat, pallid bat, San Joaquin kit fox, and American badger. The Project footprint may support three special status plant species: California jewel flower, San Joaquin woollythread, and Panoche pepper-grass.

No sensitive habitat types were identified in the AOI because of the non-natural and poor species richness of the identified communities.

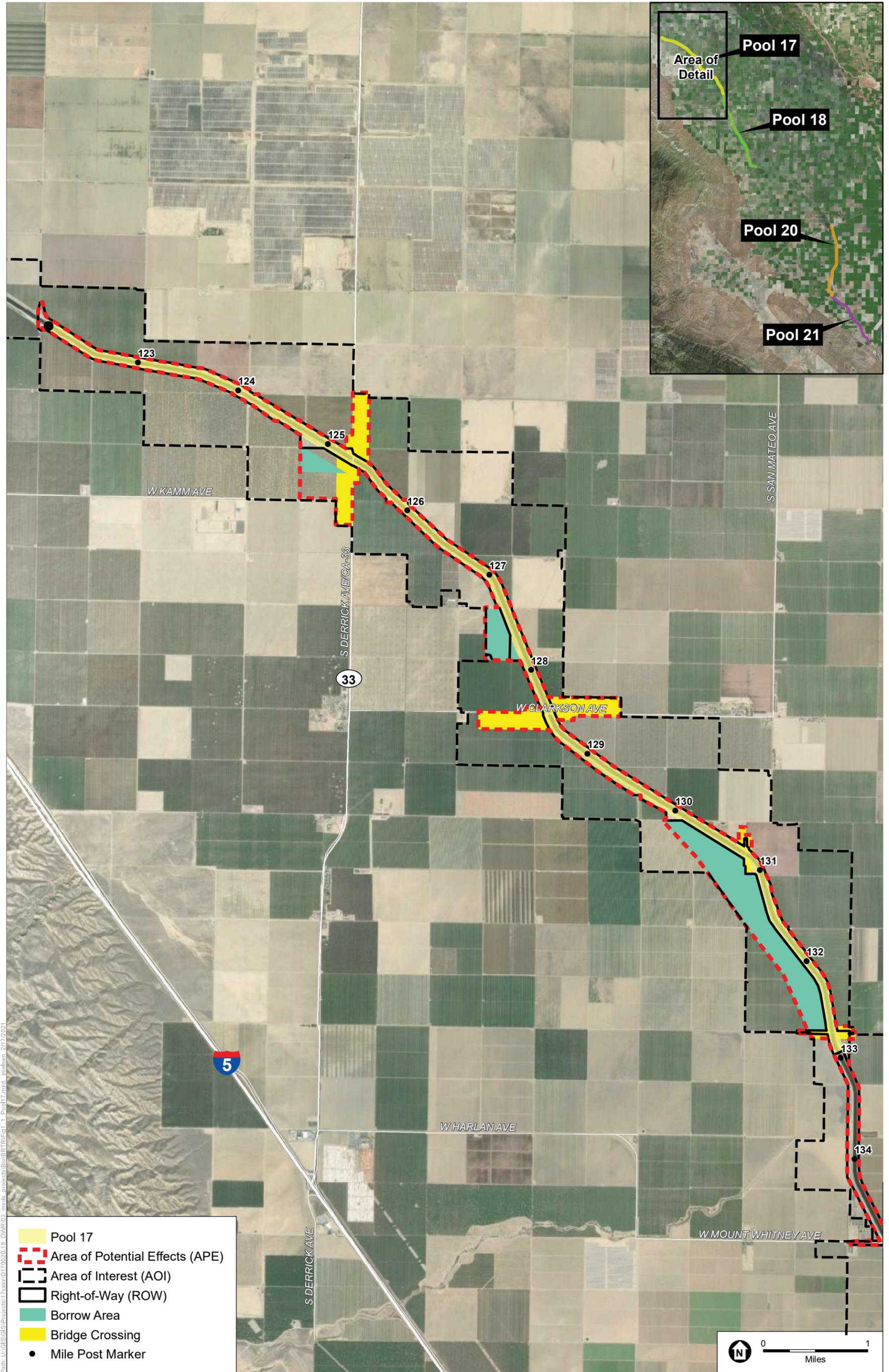
Due to the presence of special-status wildlife resources such as burrowing owl and Swainson’s hawk, avoidance and minimization measures will be implemented. Implementation of measures will avoid or minimize potential impacts to special status species.

## 10.0 References

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# Appendix A

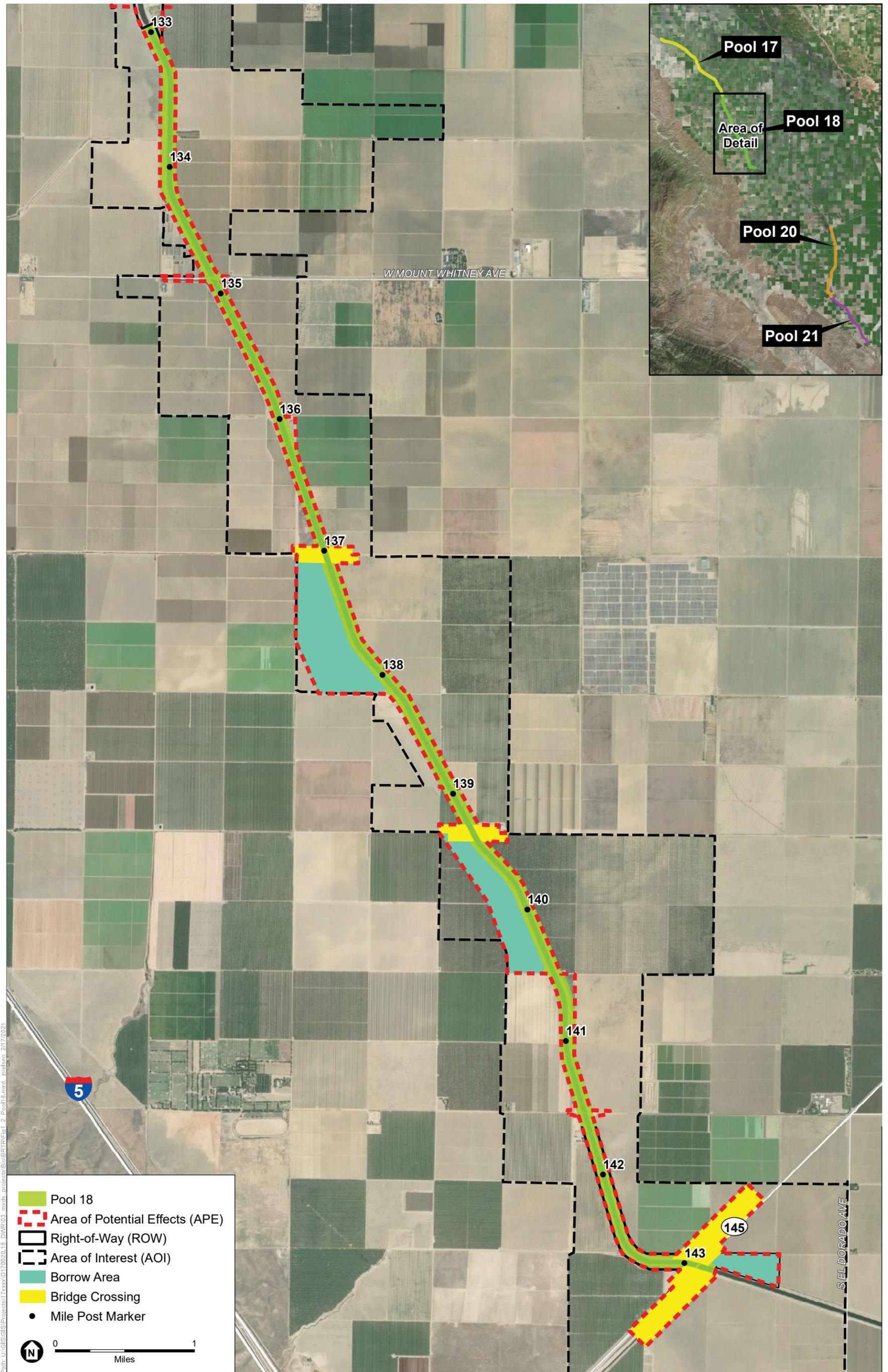
## **Figures**



SOURCE: DWR, 2021; ESA, 2021

San Luis Canal Geotechnical Investigations Project

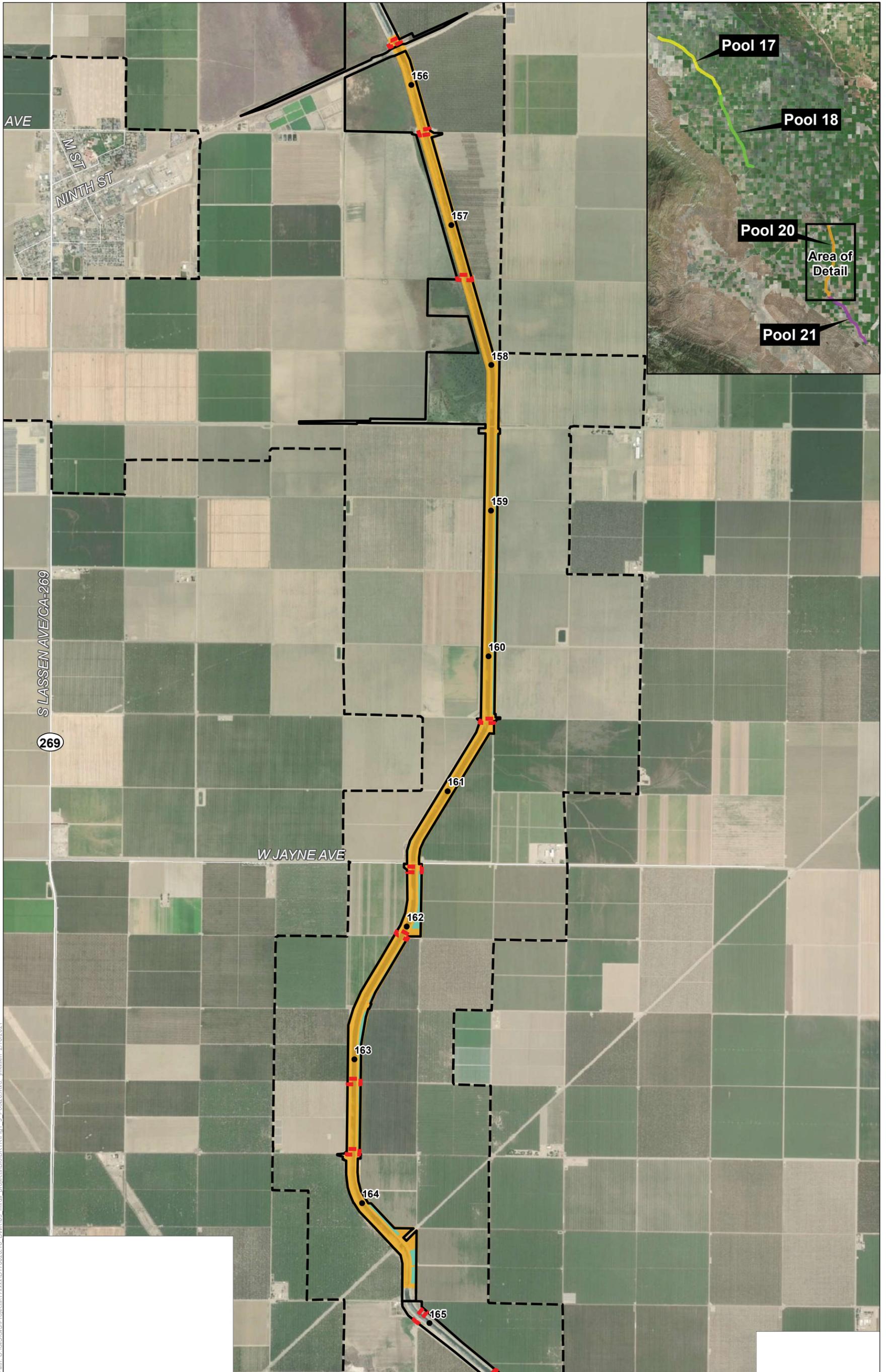
**Figure 1**  
Geotechnical Exploration Project Location Pool 17



SOURCE: DWR, 2021; ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 2**  
Geotechnical Exploration Project Location Pool 18



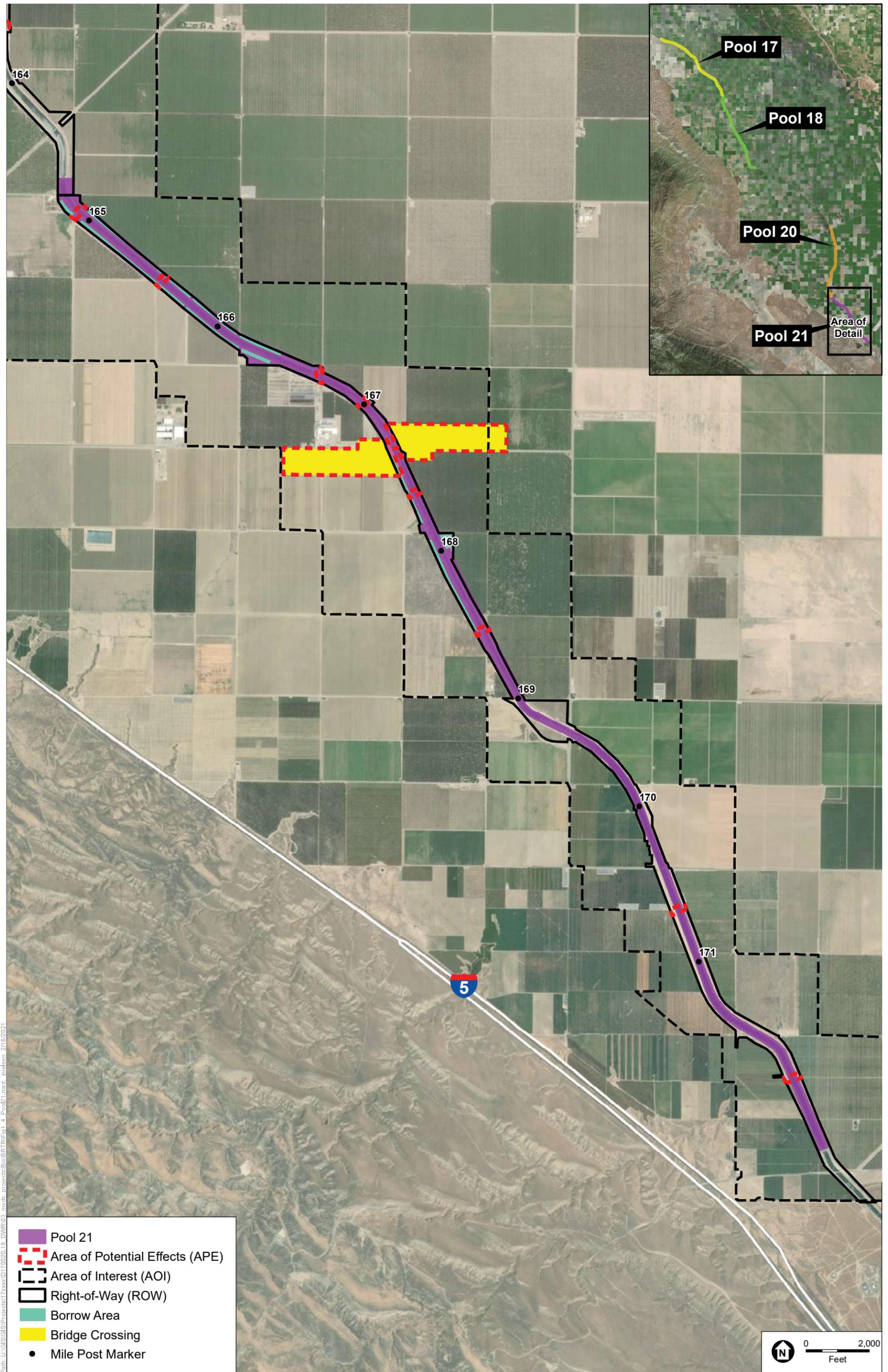
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SOURCE: DWR, 2021; ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 3**  
Geotechnical Exploration Project Location Pool 20

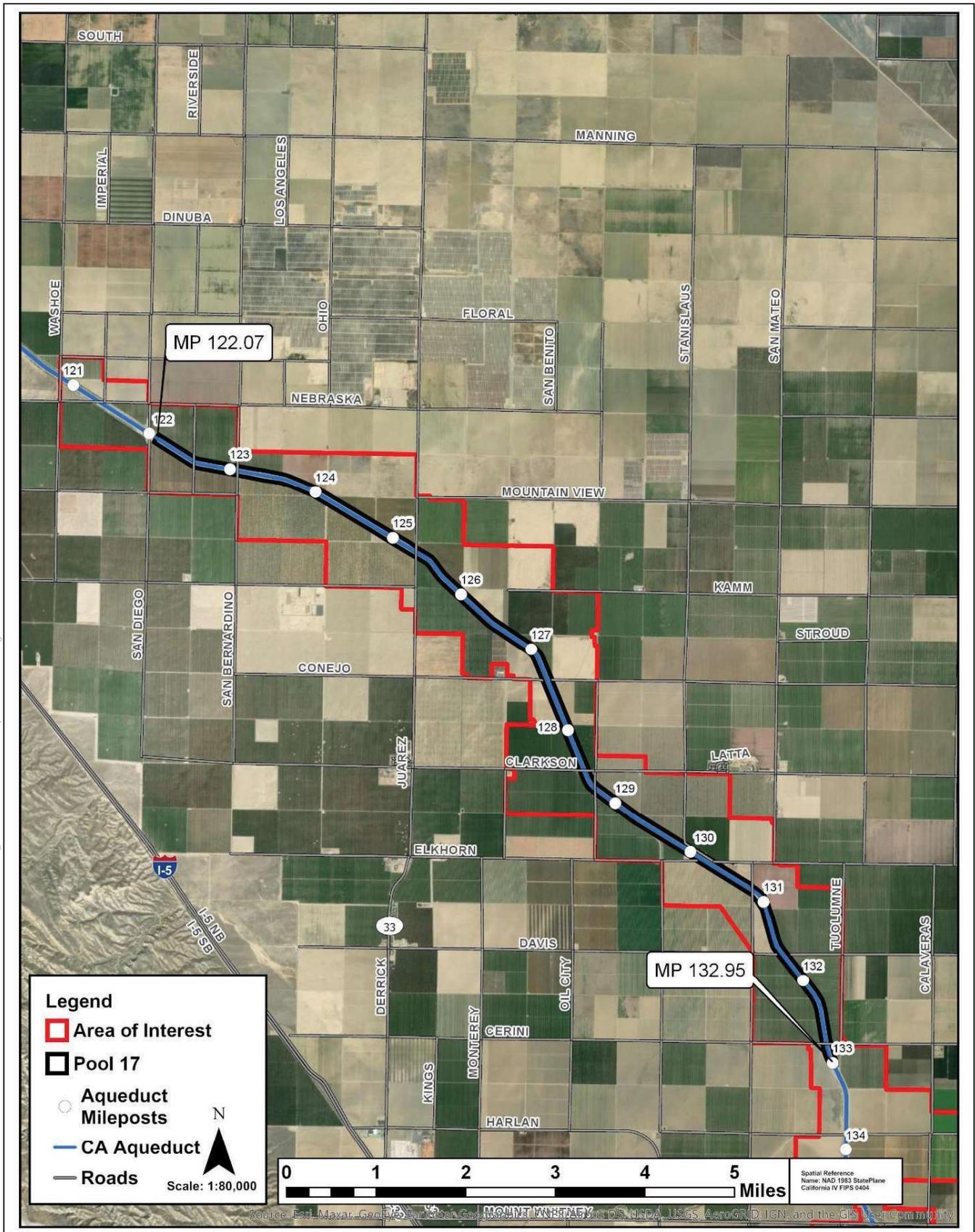




SOURCE: DWR, 2021; ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 4**  
Geotechnical Exploration Project Location Pool 21



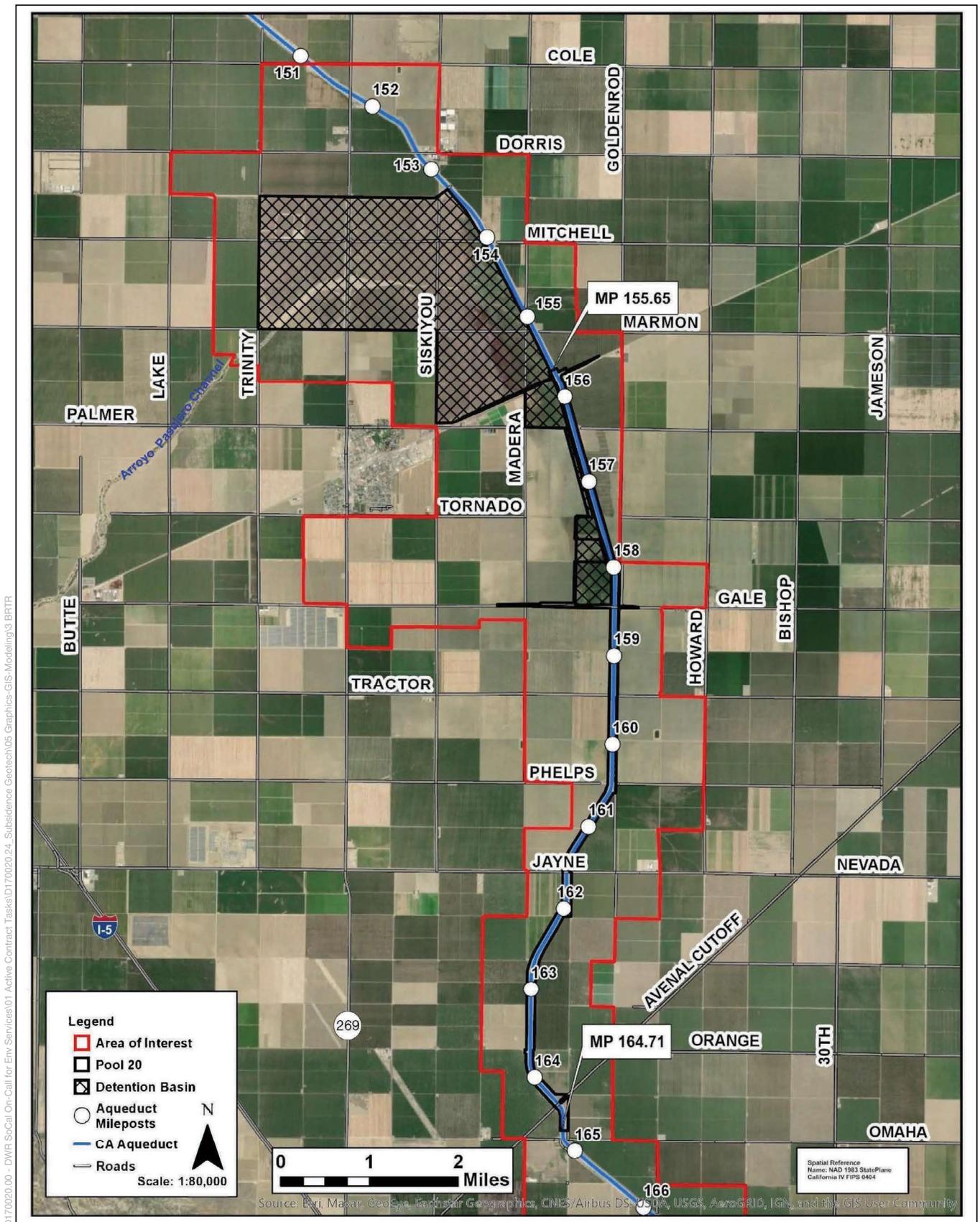
SOURCE: DWR, 2021; ESA, 2021

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**Figure 5**  
Pool 17 Area of Interest Delineation





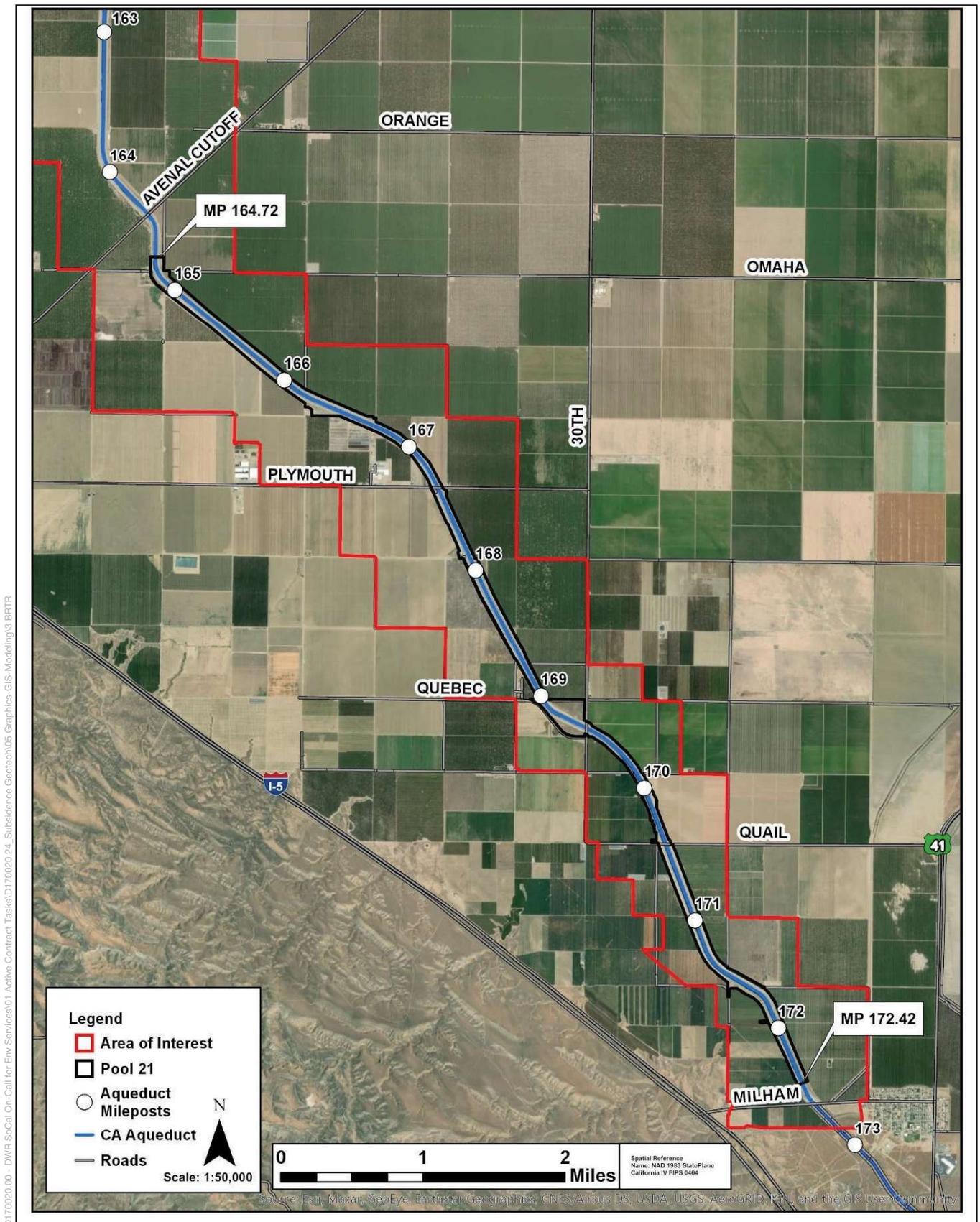


SOURCE: DWR, 2021; ESA, 2021

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**Figure 7**  
Pool 20 Area of Interest Delineation





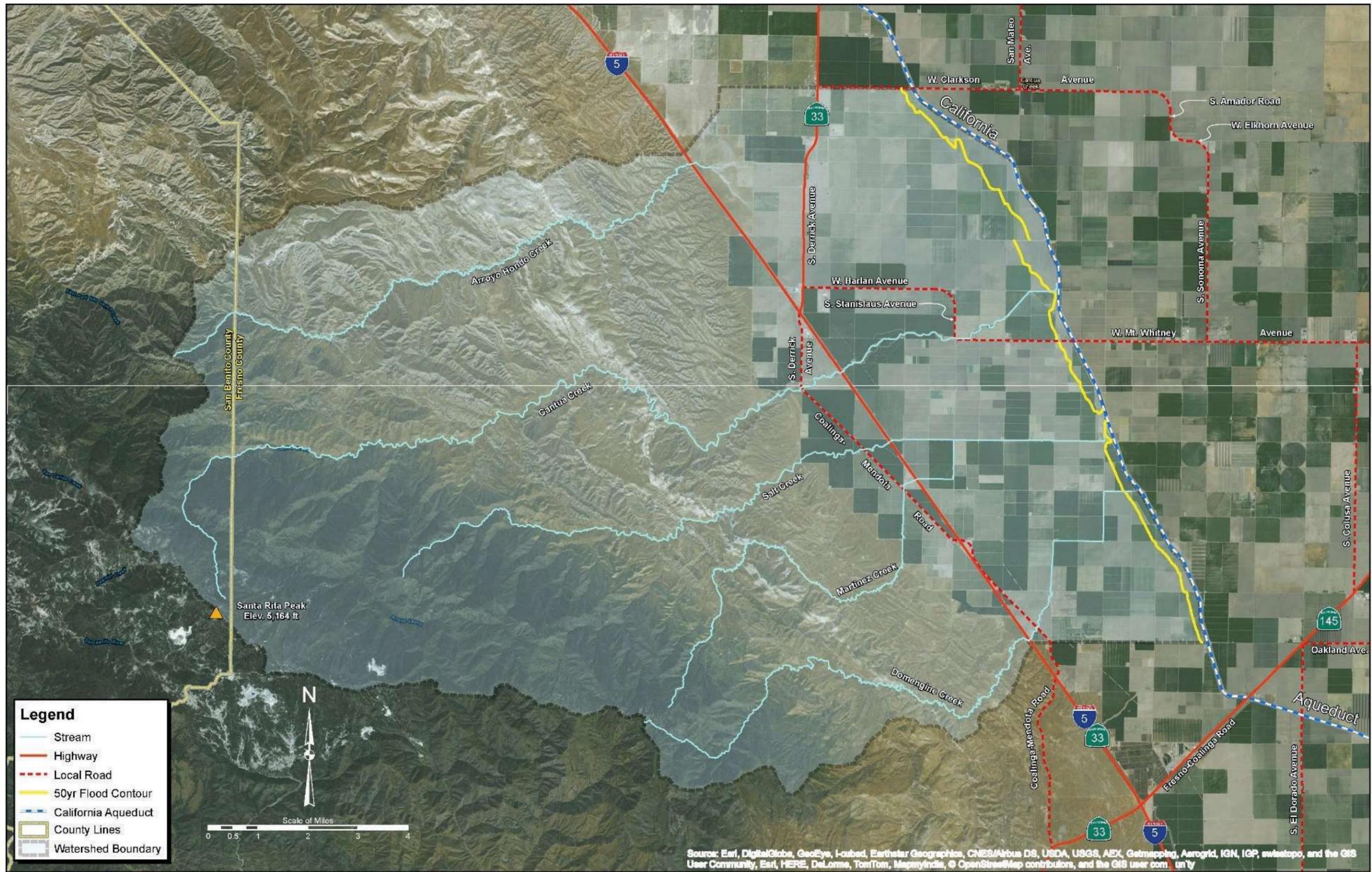
SOURCE: DWR, 2021; ESA, 2021

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**Figure 8**  
Pool 21 Area of Interest Delineation



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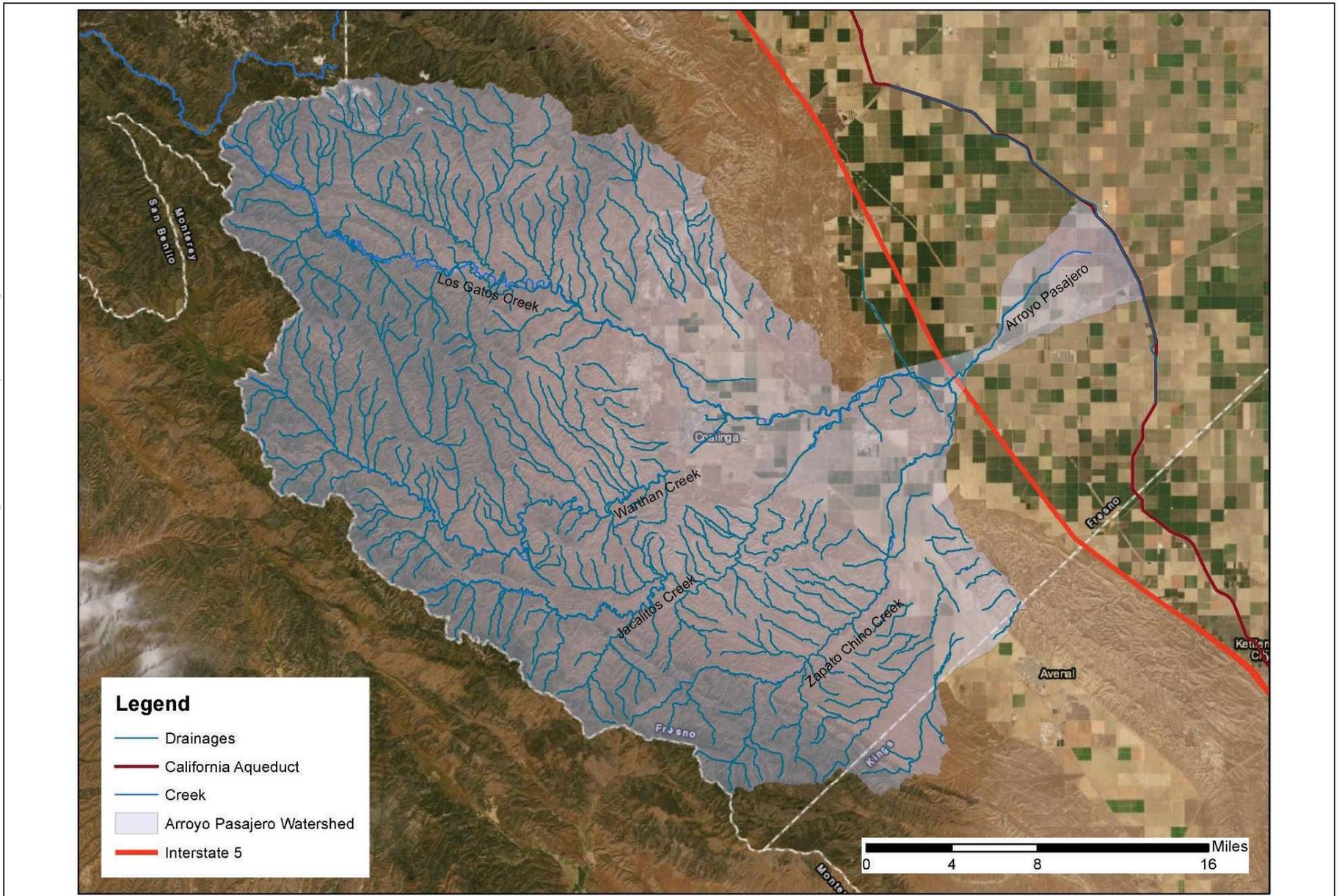
SOURCE: DWR, 2021; ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 9**  
Cantua Creek Stream Group Watershed Located in Pools 17 and 18



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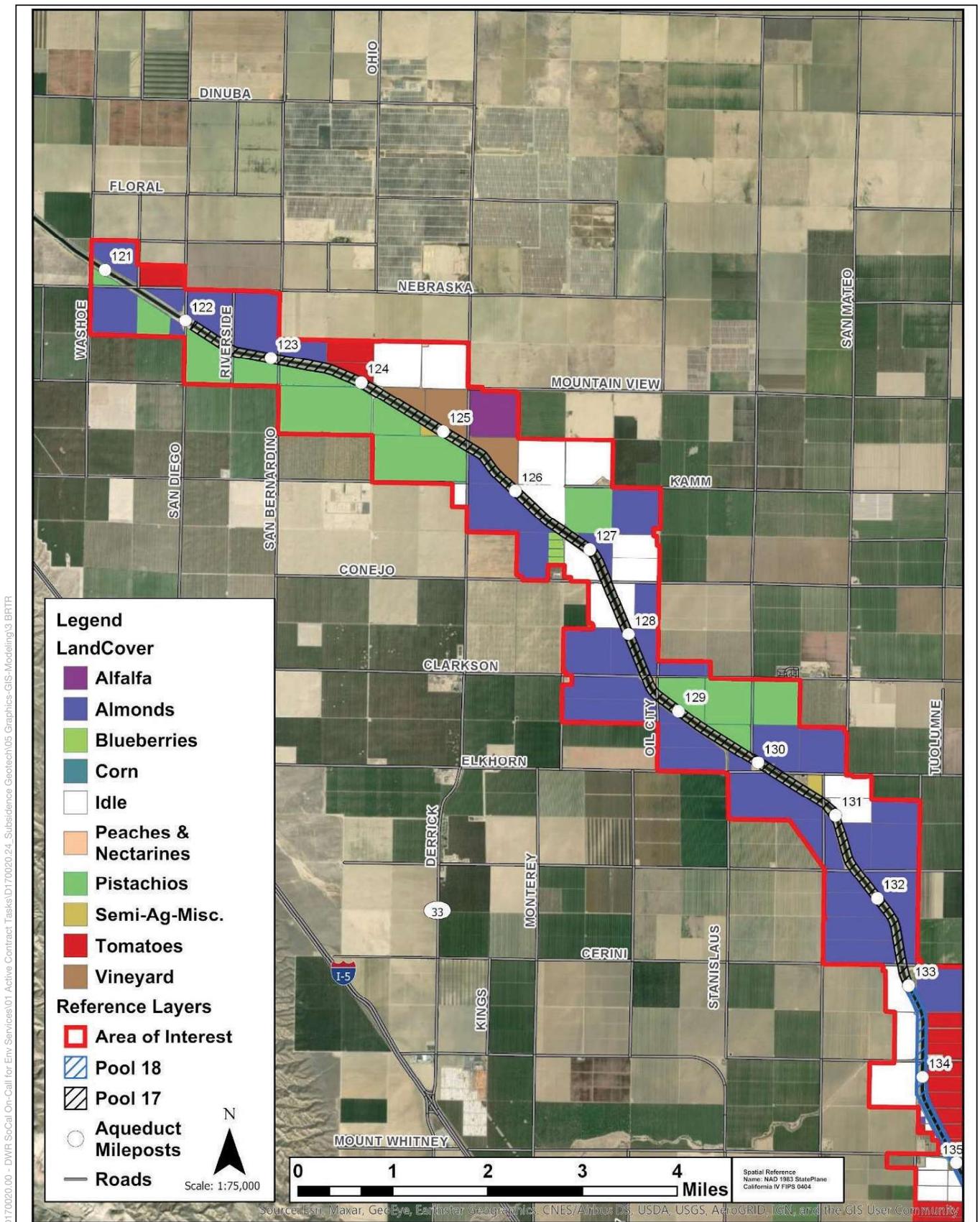


SOURCE: DWR, 2021; ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 10**  
Arroyo Pasajero Stream Group Watershed Located in Pools 20 and 21





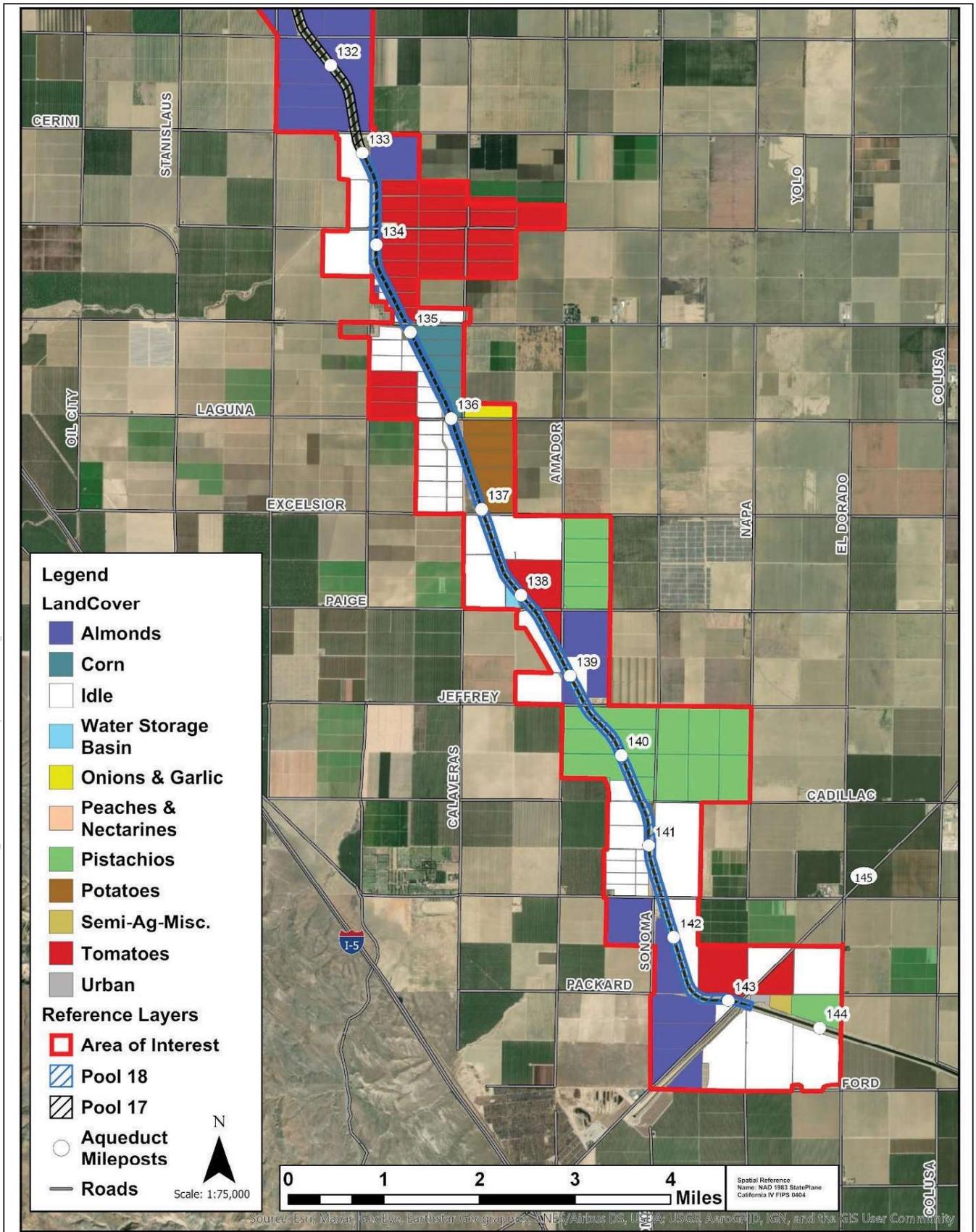
SOURCE: DWR, 2021; ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 11**  
Pool 17 Adjacent Land Use Within the AOI



D:\770020.00 - DWIR SoCal On-Call for Env Services\01 Active Contract Tasks\1770020.24 - Subsidence Geotech\05 Graphics-GIS-Modeling\3 BRTR

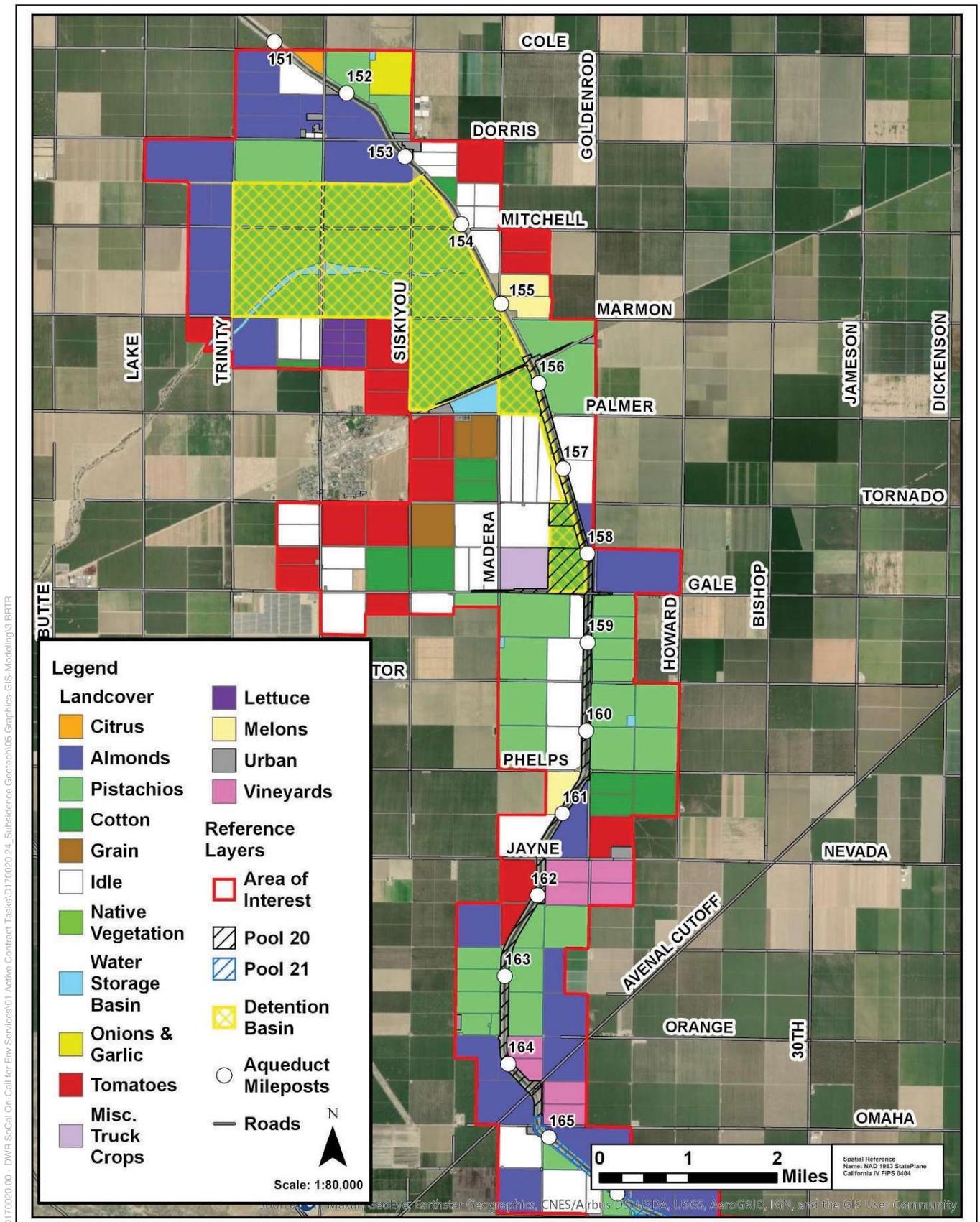


SOURCE: DWR, 2021; ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 12**  
Pool 18 Adjacent Land Use Within the AOI



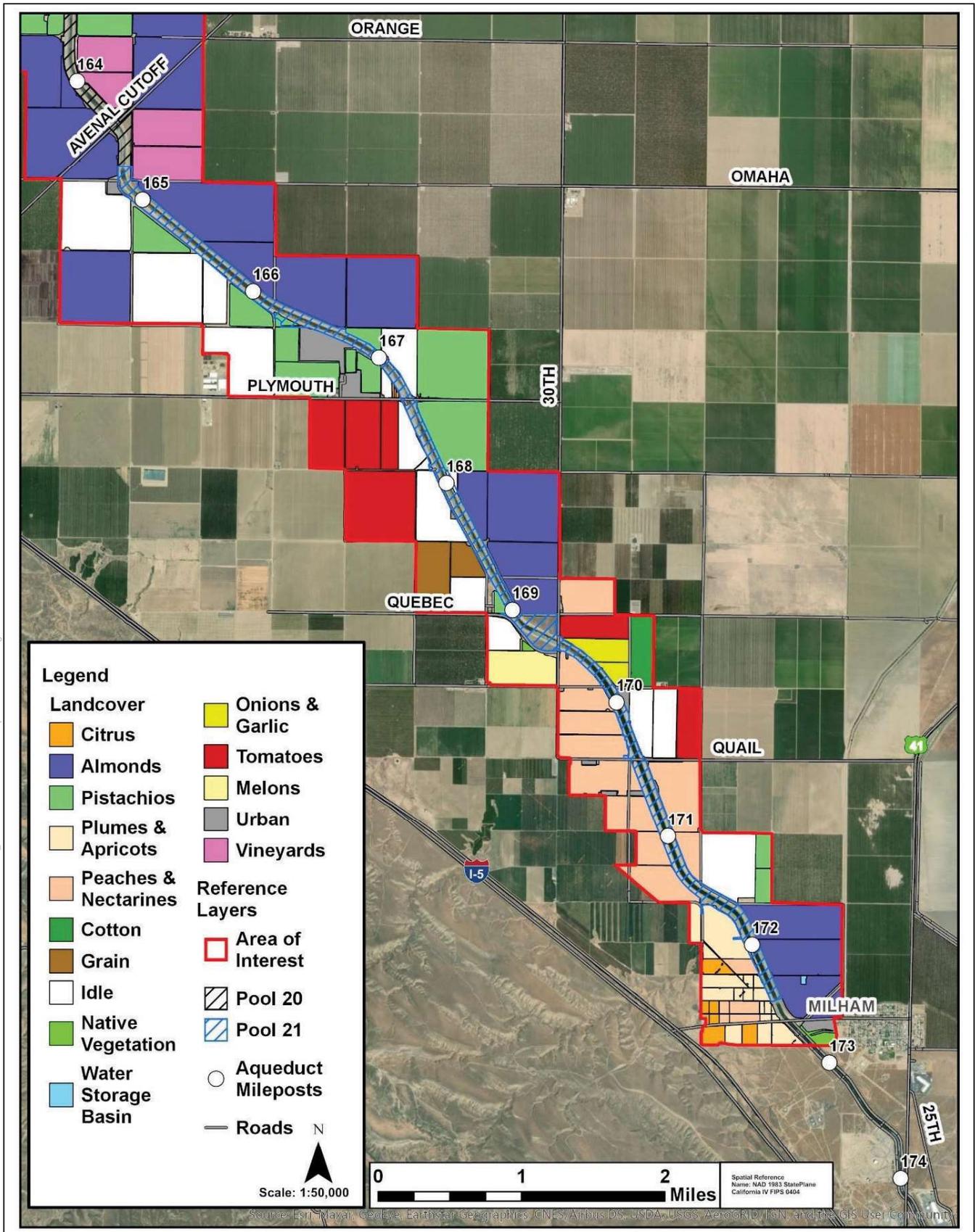


SOURCE: DWR, 2021; ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 13**  
Pool 20 Adjacent Land Use Within the AOI





SOURCE: DWR, 2021; ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 14**  
Pool 21 Adjacent Land Use Within the AOI



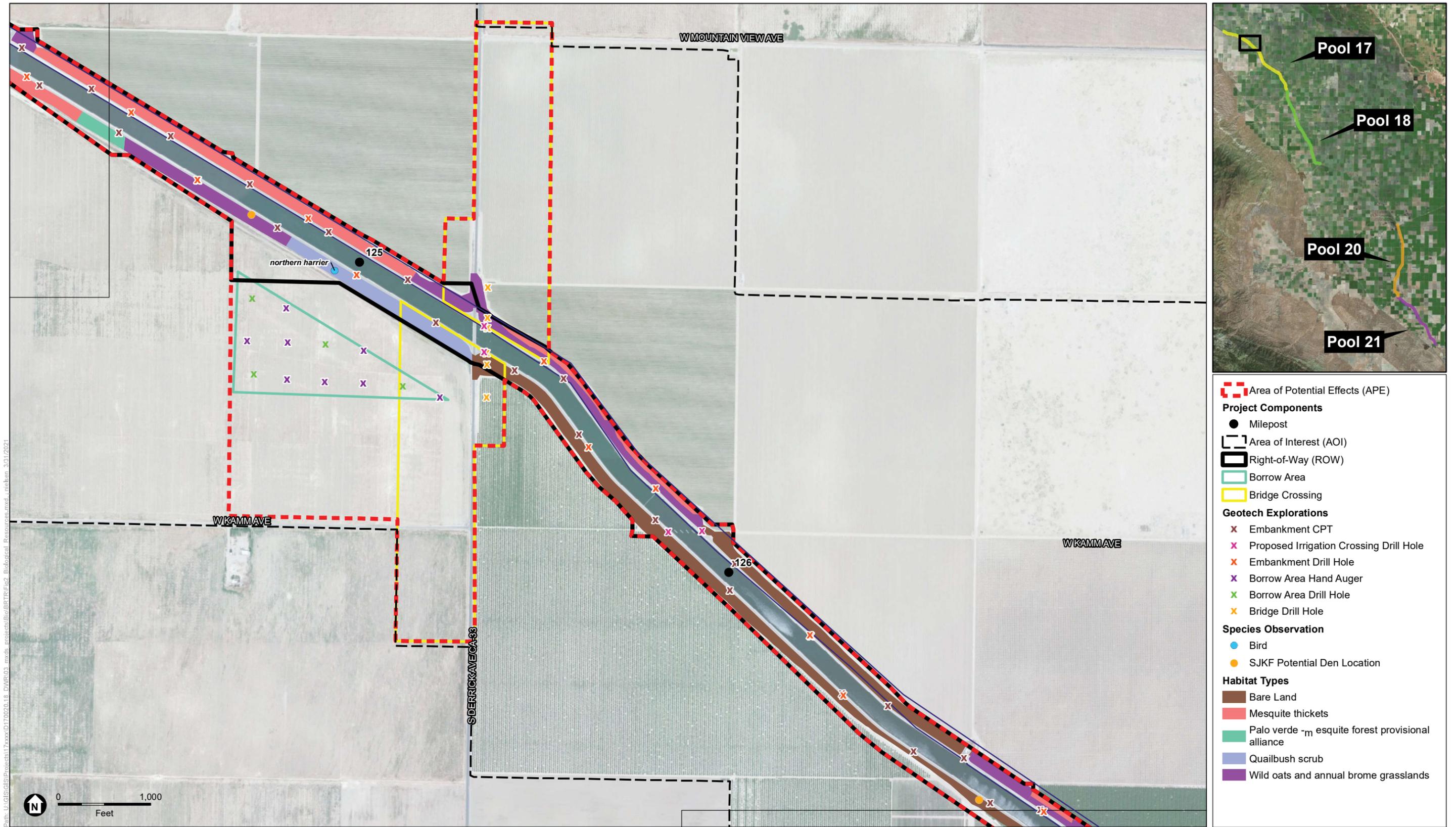


SOURCE: ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 15**  
Vegetation Alliance and Special-Status Resource Mapping from MP 122 to MP 124





SOURCE: ESA, 2021

San Luis Canal Geotechnical Investigations Project

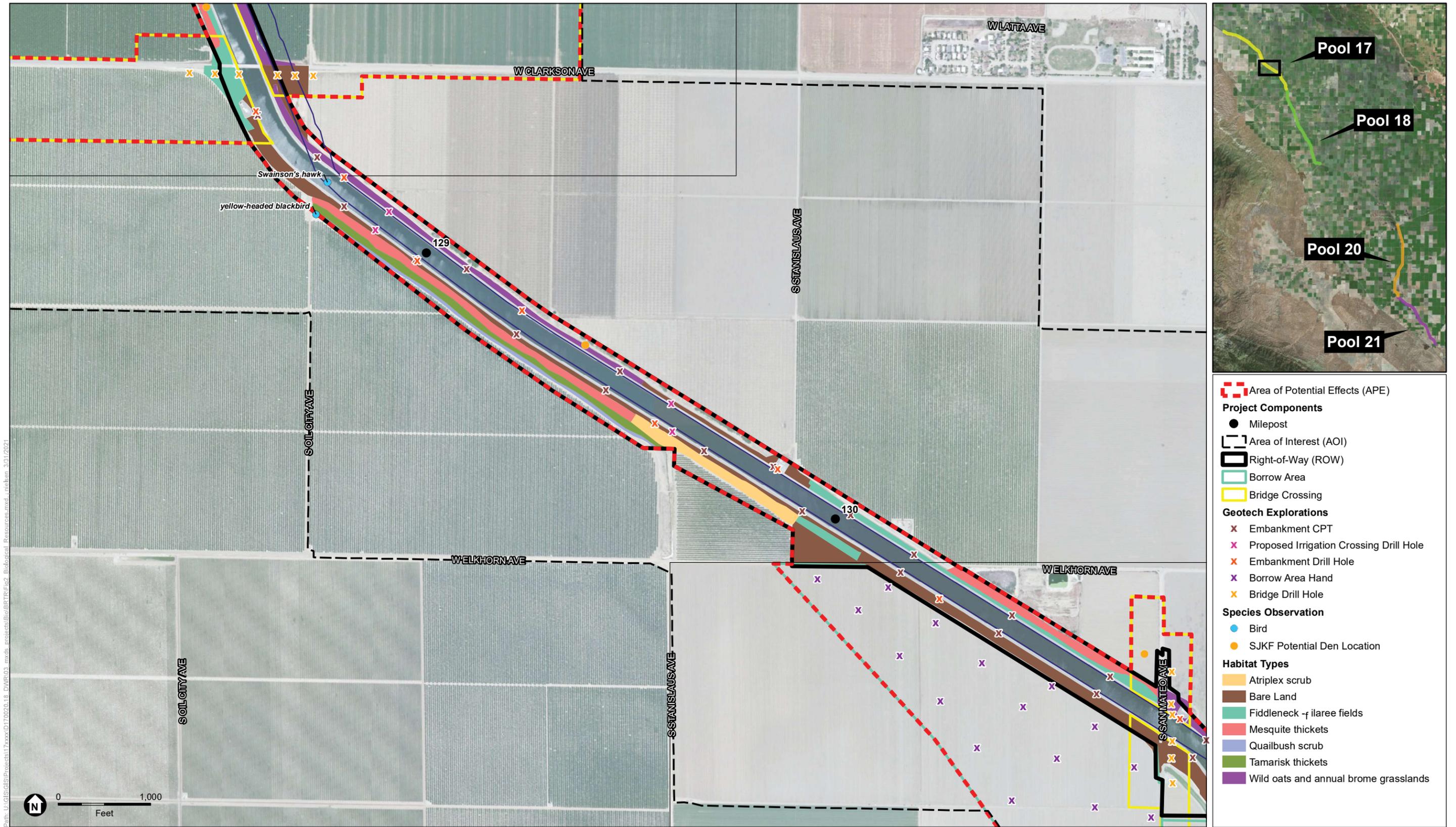
**Figure 16**  
Vegetation Alliance and Special-Status Resource Mapping from MP 124 to MP 126



SOURCE: ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 17**  
Vegetation Alliance and Special-Status Resource Mapping from MP 127 to MP 128



SOURCE: ESA, 2021

San Luis Canal Geotechnical Investigations Project

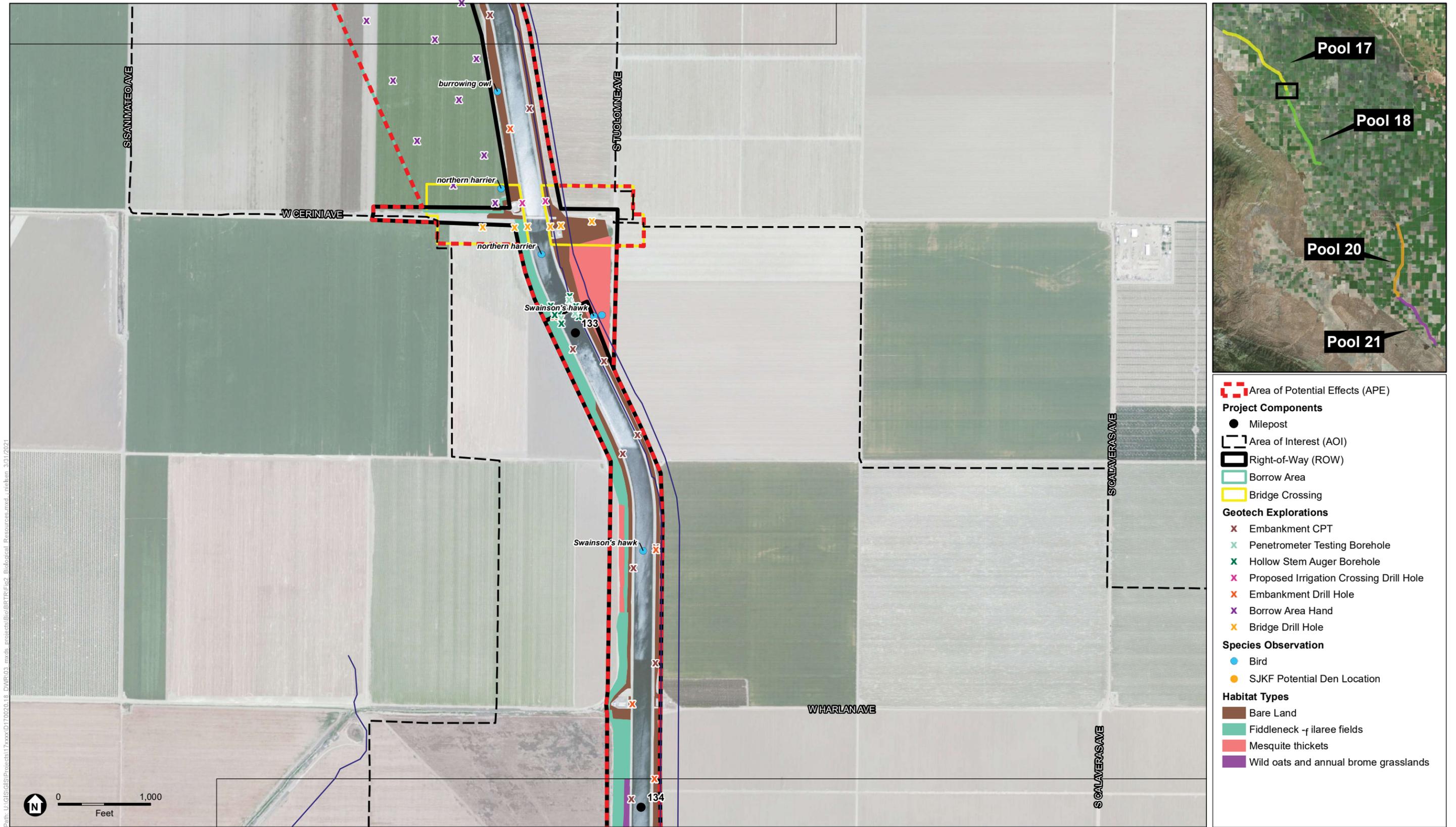
**Figure 18**  
Vegetation Alliance and Special-Status Resource Mapping from MP 129 to MP 130



SOURCE: ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 19**  
Vegetation Alliance and Special-Status Resource Mapping from MP 131 to MP 132



SOURCE: ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 20**  
Vegetation Alliance and Special-Status Resource Mapping from MP 133 to MP 134



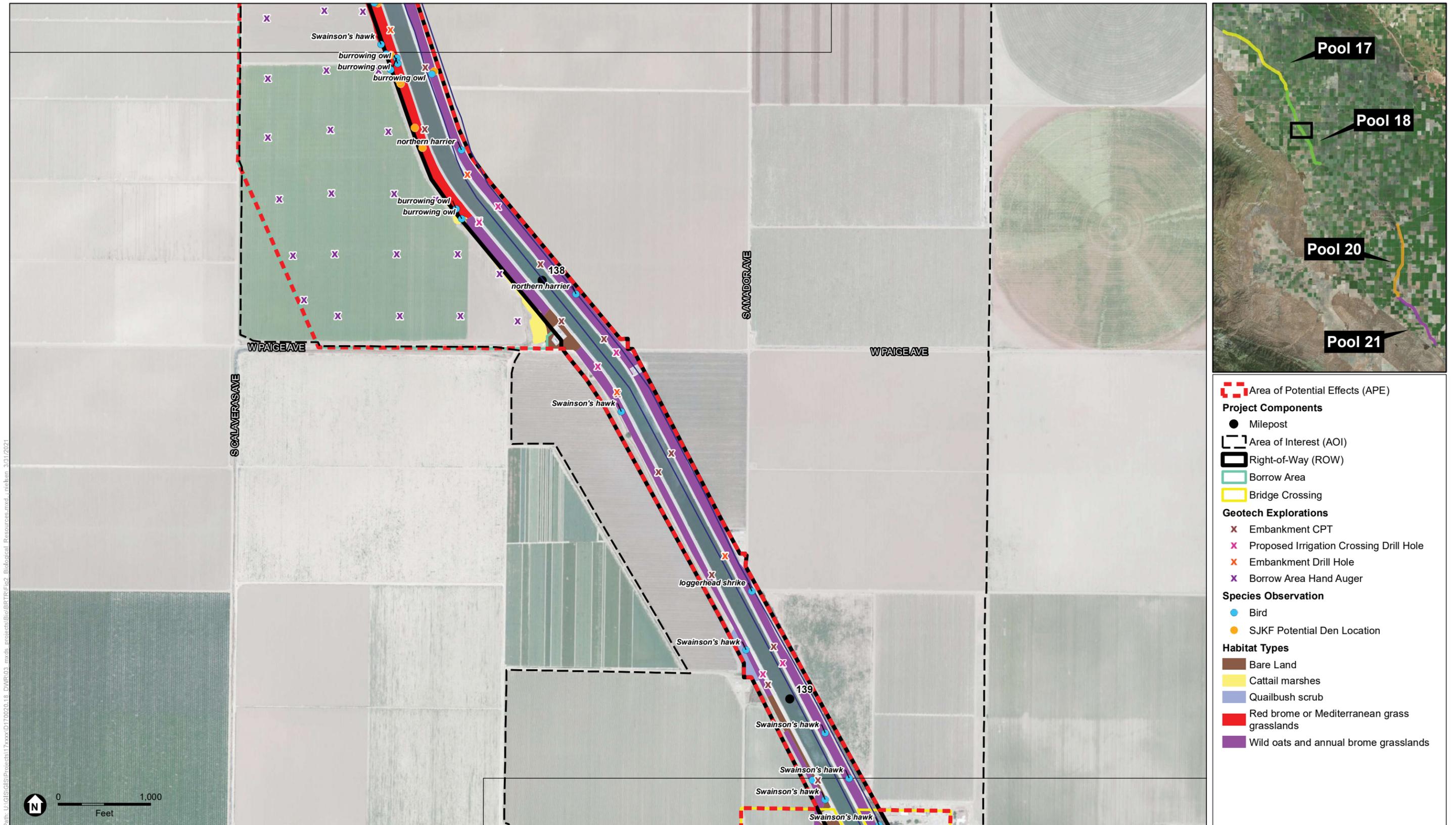


SOURCE: ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 22**  
Vegetation Alliance and Special-Status Resource Mapping from MP 136 to MP 137





SOURCE: ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 23**  
Vegetation Alliance and Special-Status Resource Mapping from MP 138 to MP 139





SOURCE: ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 24**  
 Vegetation Alliance and Special-Status Resource Mapping from MP 140 to MP 141



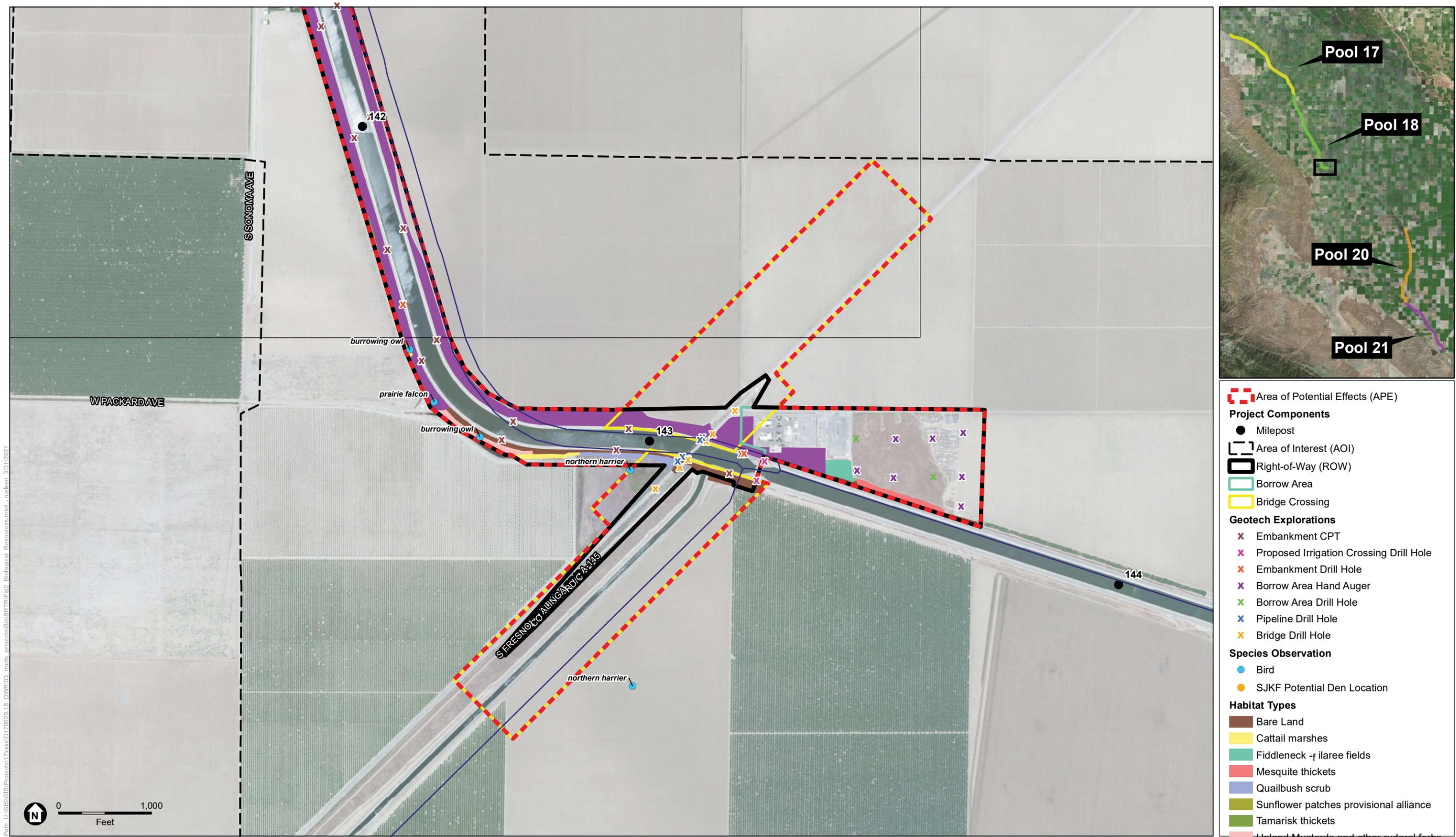


SOURCE: ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 25**  
Vegetation Alliance and Special-Status Resource Mapping from MP 141 to MP 142





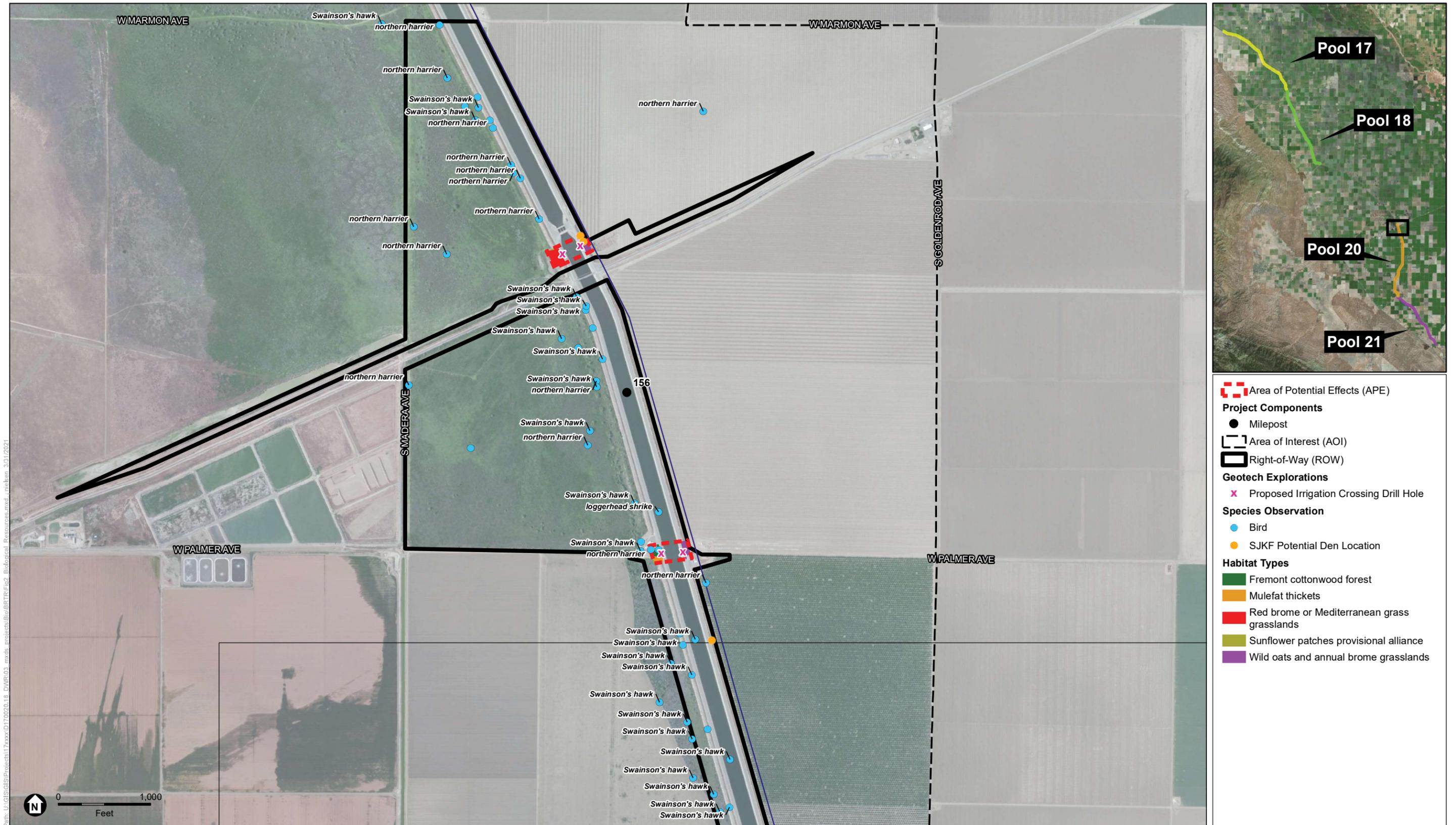
SOURCE: ESA, 2021.

San Luis Canal Geotechnical Investigations Project

**Figure 26**

Vegetation Alliance and Special-Status Resource Mapping from MP 142 to MP 144





SOURCE: ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 27**  
Vegetation Alliance and Special-Status Resource Mapping at MP 156





SOURCE: ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 28**  
Vegetation Alliance and Special-Status Resource Mapping From MP 157 to MP 158





SOURCE: ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 29**  
Vegetation Alliance and Special-Status Resource Mapping From MP 161 to MP 162





SOURCE: ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 30**  
Vegetation Alliance and Special-Status Resource Mapping From MP 163 to MP 164





SOURCE: ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 32**  
 Vegetation Alliance and Special-Status Resource Mapping From MP 166 to MP 168

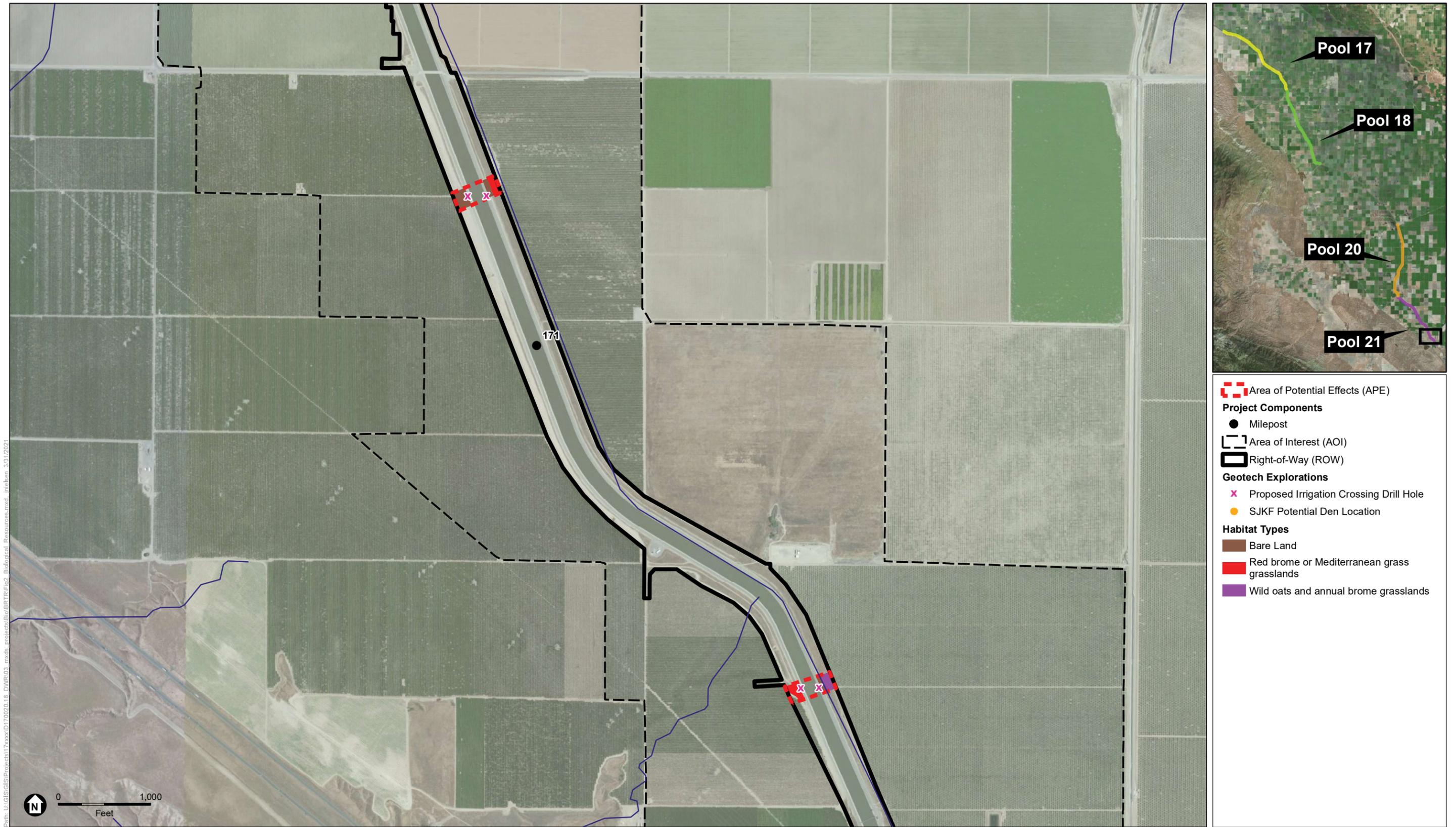




SOURCE: ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 33**  
Vegetation Alliance and Special-Status Resource Mapping From MP 168 to MP 169

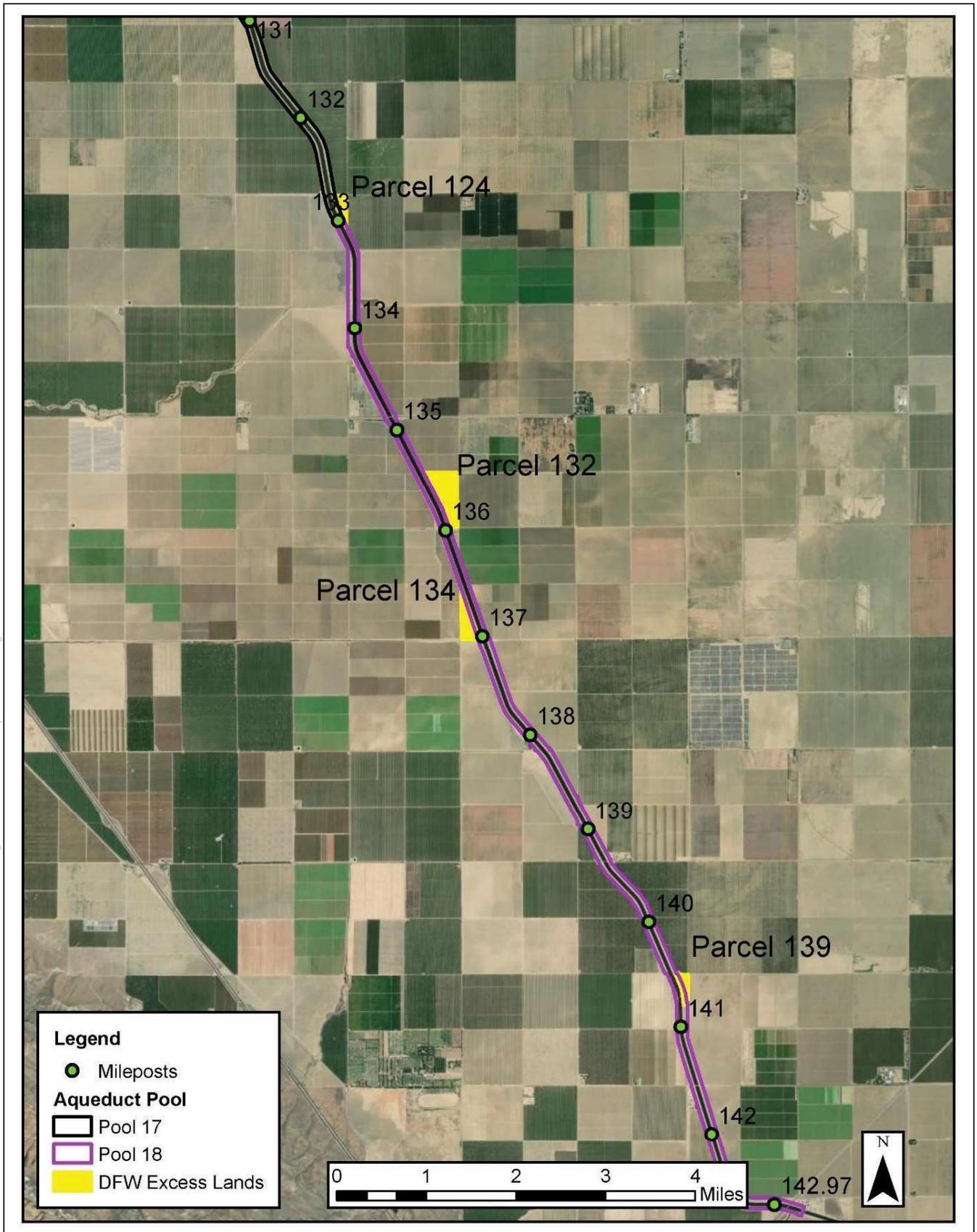


SOURCE: ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 34**  
Vegetation Alliance and Special-Status Resource Mapping At MP 171

D:\70020.00 - DWIR SoCal On-Call for Env Services\01 Active Contract Tasks\170020.24 - Subsidence Geotech\05 Graphics-GIS-Modeling\3 BRTR



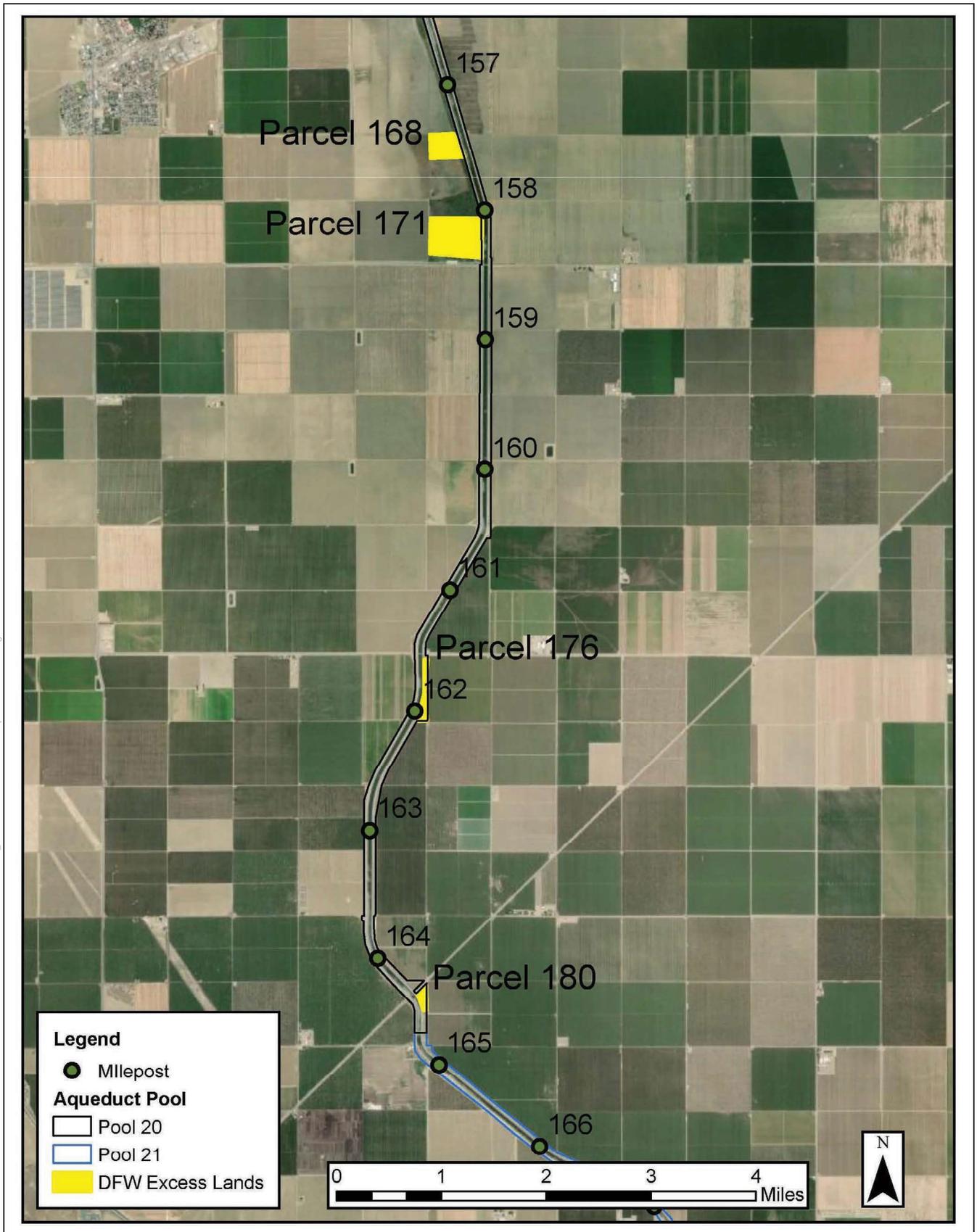
SOURCE: DWR, 2021; ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 35**  
Pools 17 and 18 CDFW Excess Lands Locations



DT70020.00 - DWIR SoCal On-Call for Env. Services/OT Active Contract Tasks/DT70020.24 - Subsidence Geotech/05 Graphics-GIS-Modeling/3 BRTR



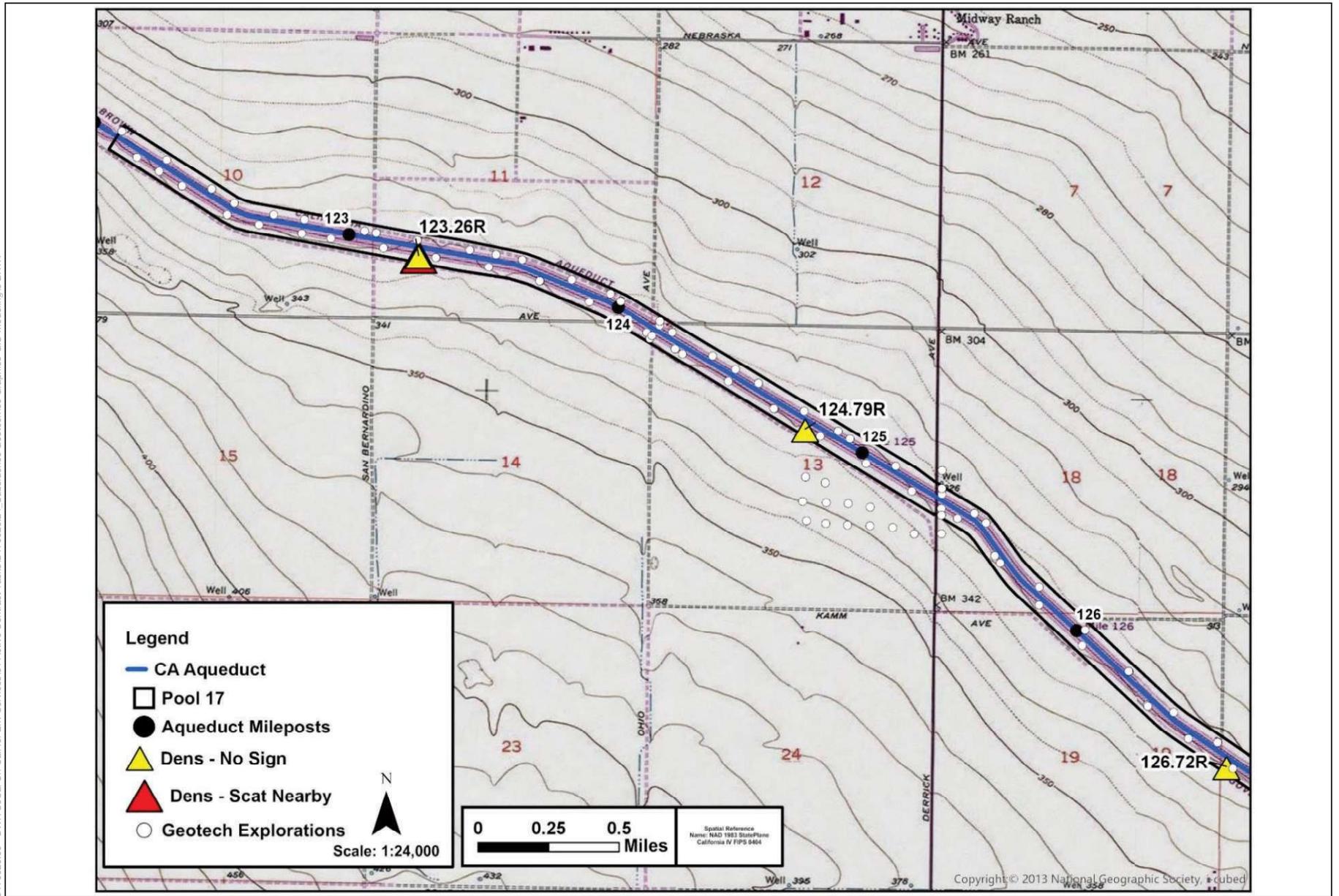
SOURCE: DWR, 2021; ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 36**  
Pools 20 and 21 CDFW Excess Lands Locations



D:\770020.00 - DWR SoCal On-Call for Env. Services\01 Active Contract Tasks\770020.24 - Subsidence Geotech\05 Graphics-GIS-Modeling\3 BRTR



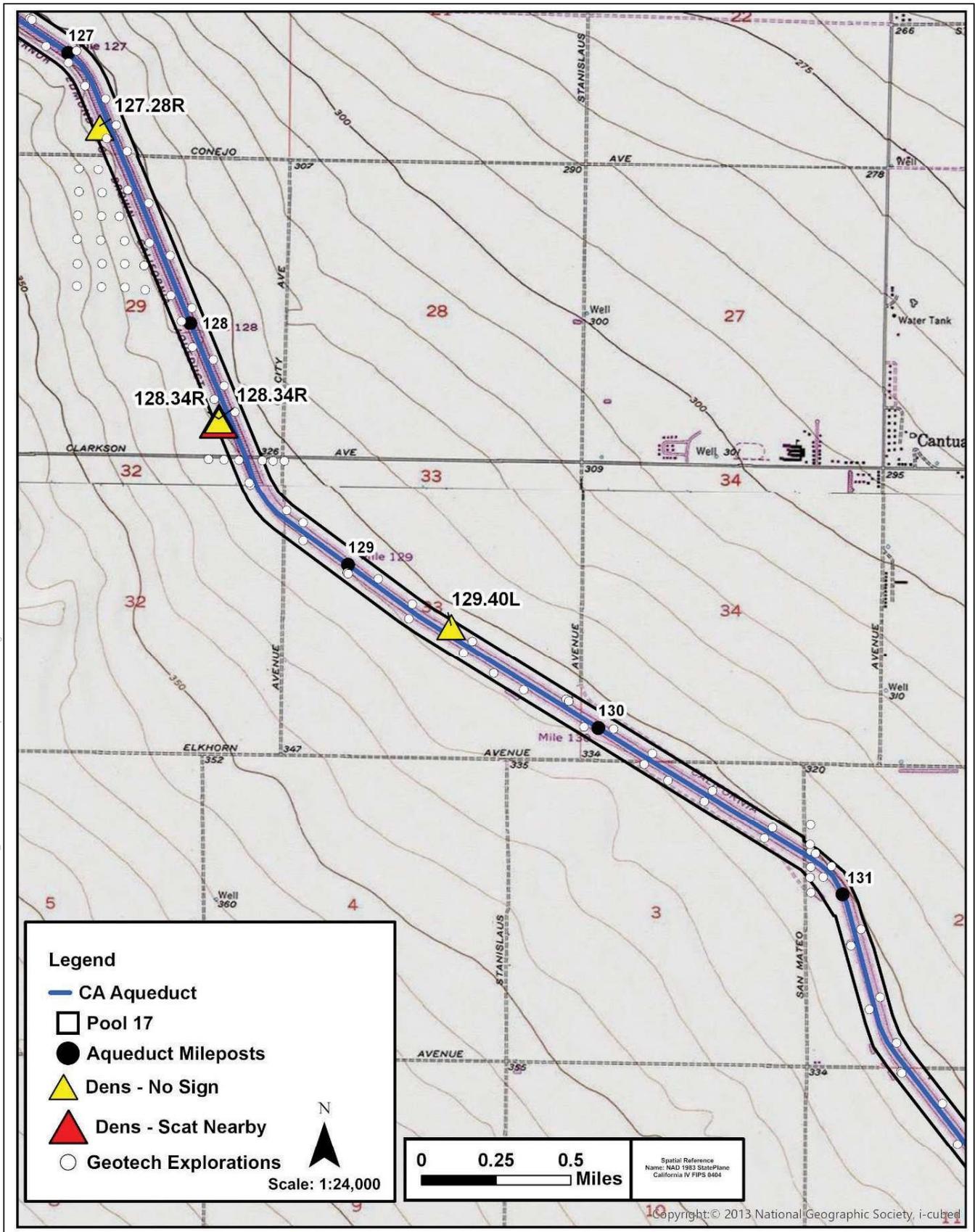
SOURCE: DWR, 2021; ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 37**  
2020 Survey Results of Dens and Burrow Locations MP 122 to MP 126.72



D:\770020.00 - DWIR SoCal On-Call for Env. Services\01 Active Contract Tasks\1770020.24 - Subsidence Geotech\05 Graphics-GIS-Modeling\3 BRTR



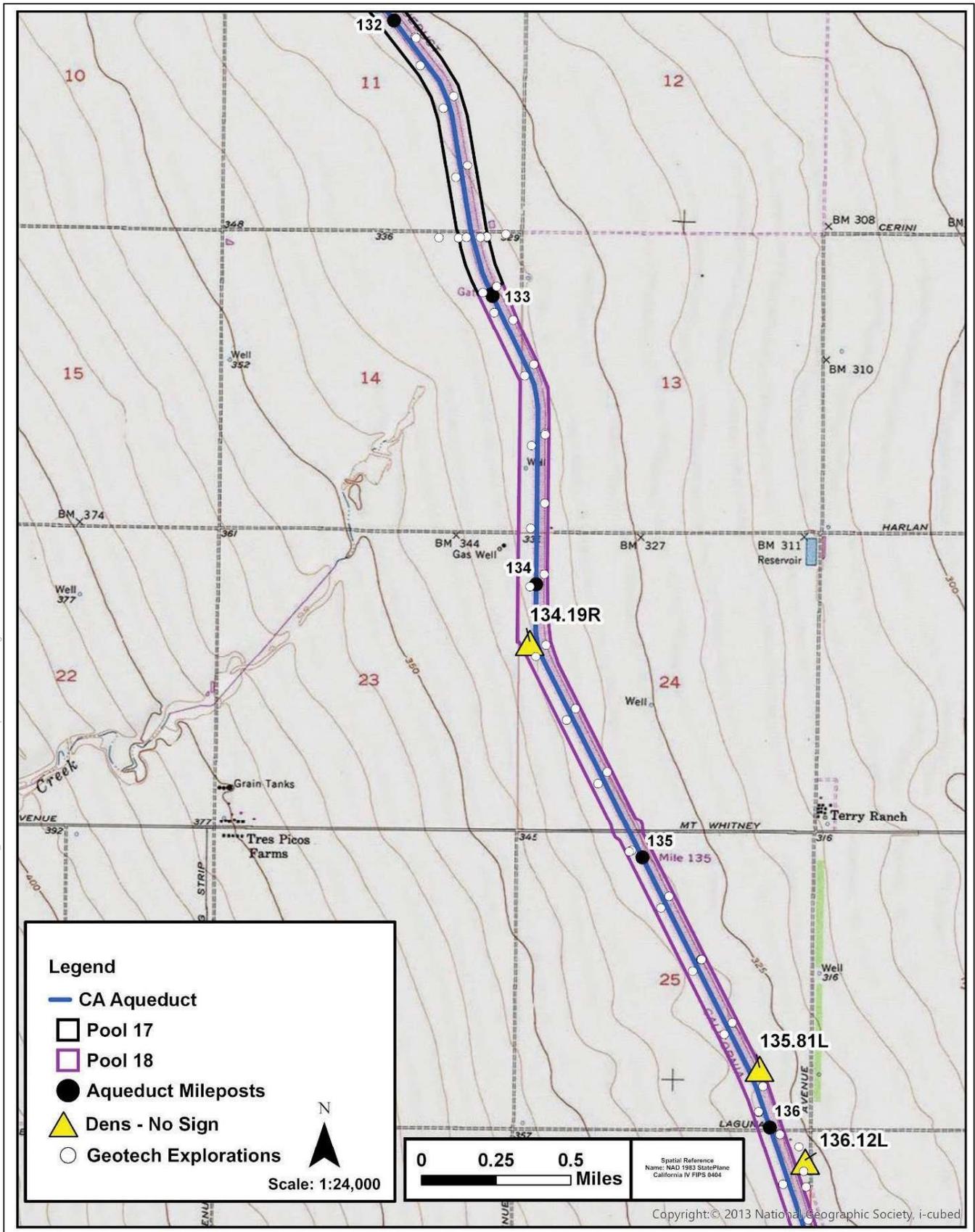
SOURCE: DWR, 2021; ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 38**  
2020 Survey Results of Dens and Burrow Locations MP 126.72 to MP 132



D:\770020.00 - DWI SoCal On-Call for Env Services\01 Active Contract Tasks\1770020.24 - Subsidence Geotech\05 Graphics-GIS-Modeling\3 BRTR



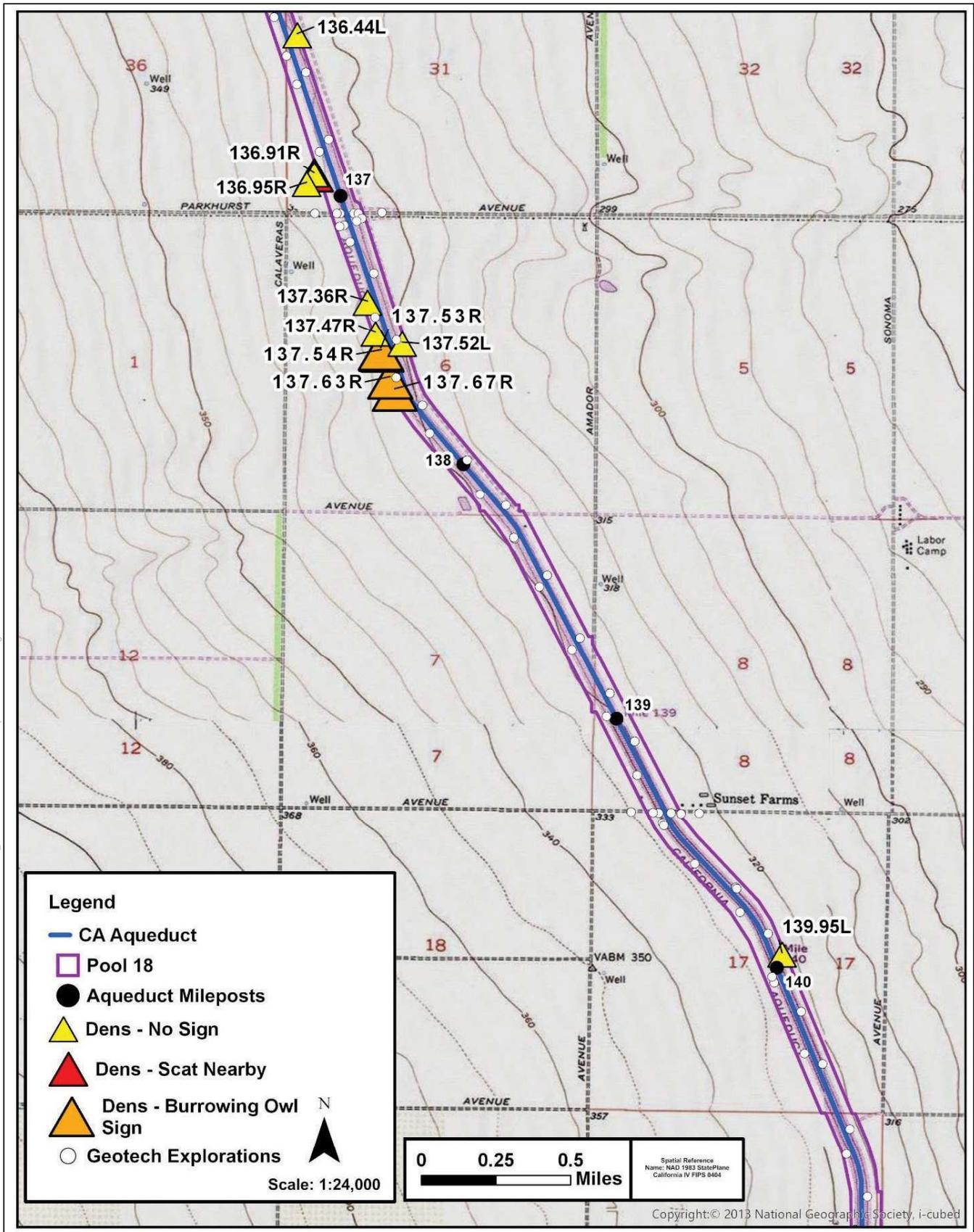
SOURCE: DWR, 2021; ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 39**  
2020 Survey Results of Dens and Burrow Locations MP 132 to MP 136



D:\770020.00 - DWIR SoCal On-Call for Env. Services\01 Active Contract Tasks\1770020.24 - Subsidence Geotech\05 Graphics-GIS-Modeling\3 BRTR



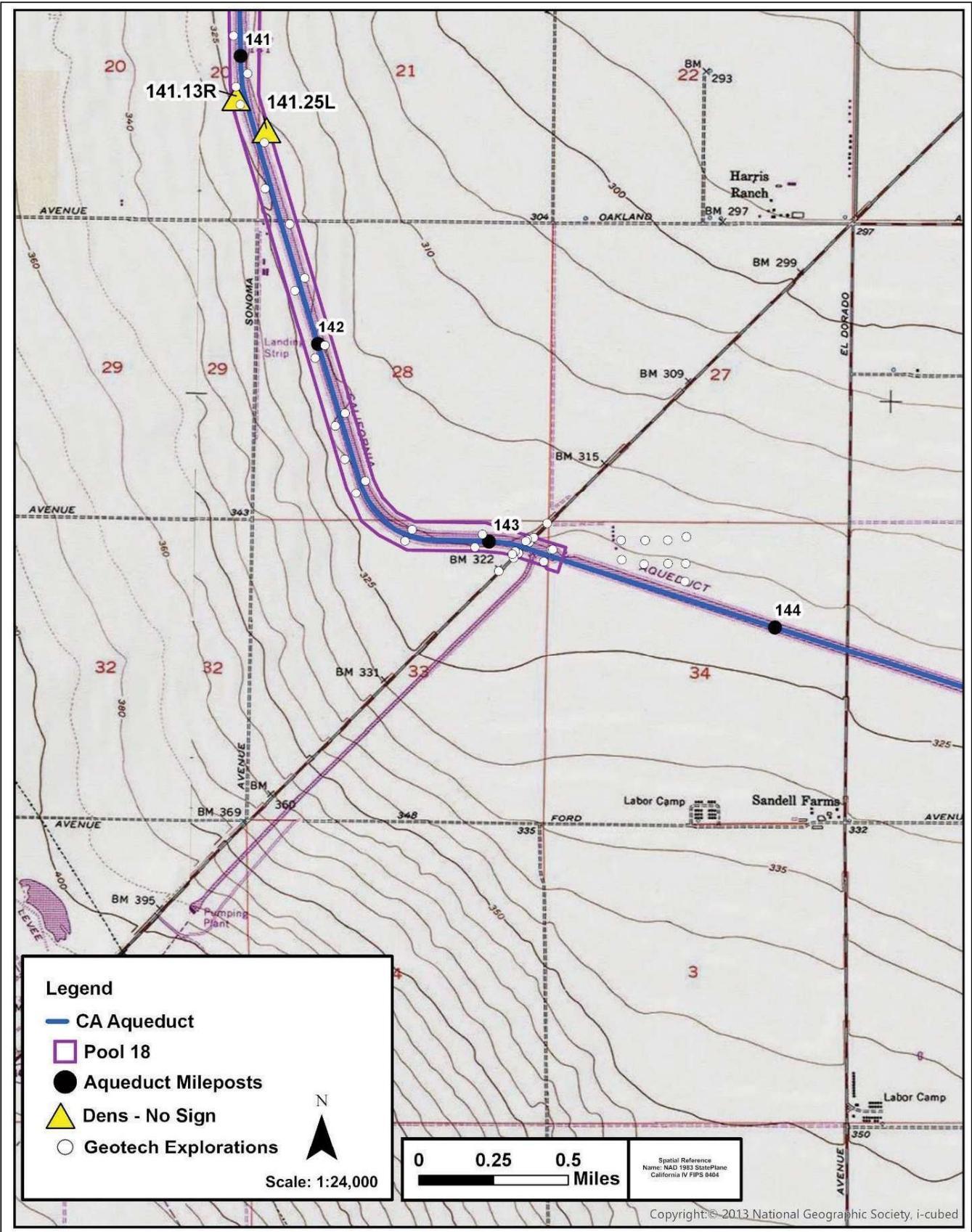
SOURCE: DWR, 2021; ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 40**  
2020 Survey Results of Dens and Burrow Locations MP 136.44 to MP 141



D:\770020.00 - DWI SoCal On-Call for Env Services\01 Active Contract Tasks\1770020.24 - Subsidence Geotech\05 Graphics-GIS-Modeling\3 BRTR

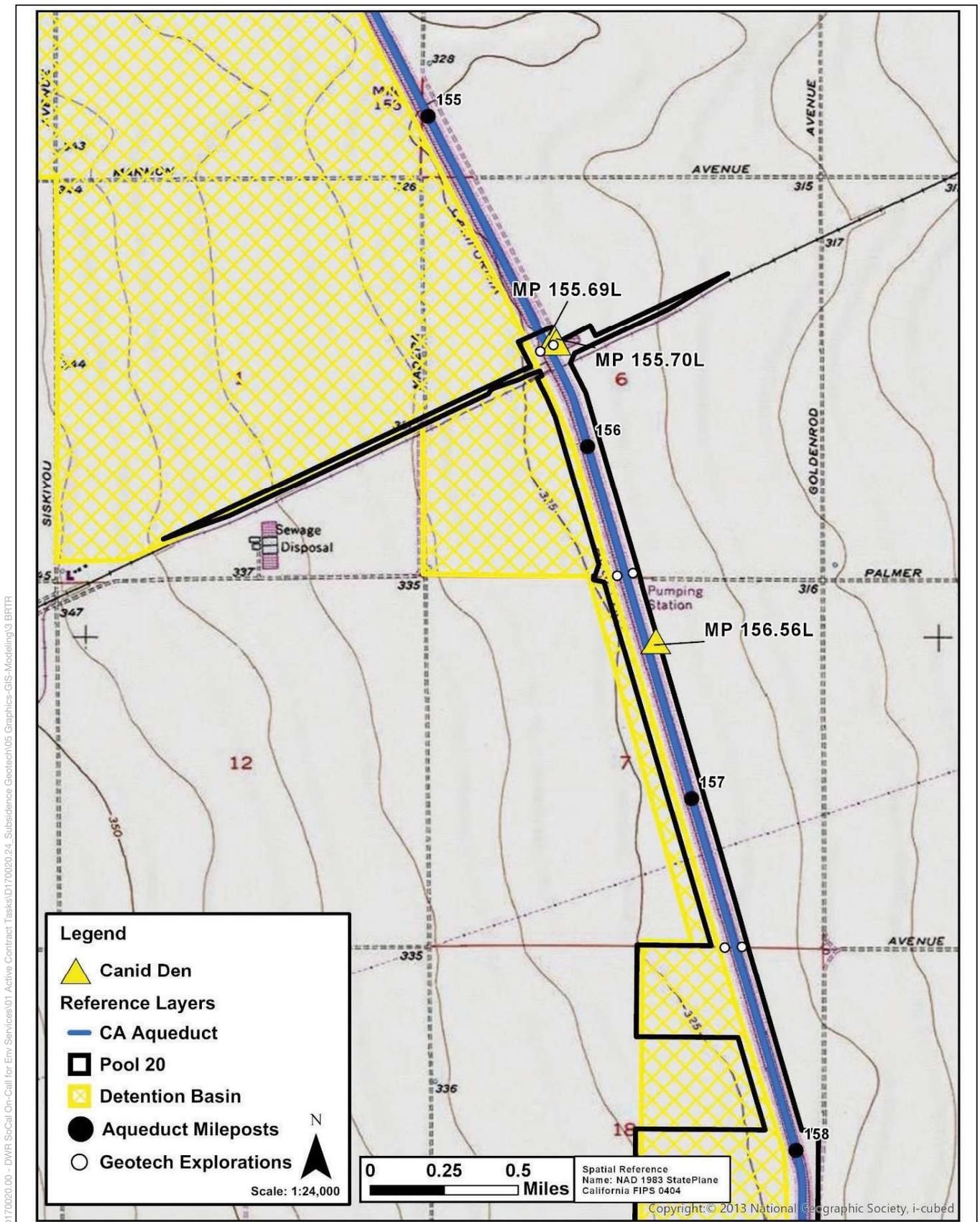


SOURCE: DWR, 2021; ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 41**  
2020 Survey Results of Dens and Burrow Locations MP 141 to MP 144





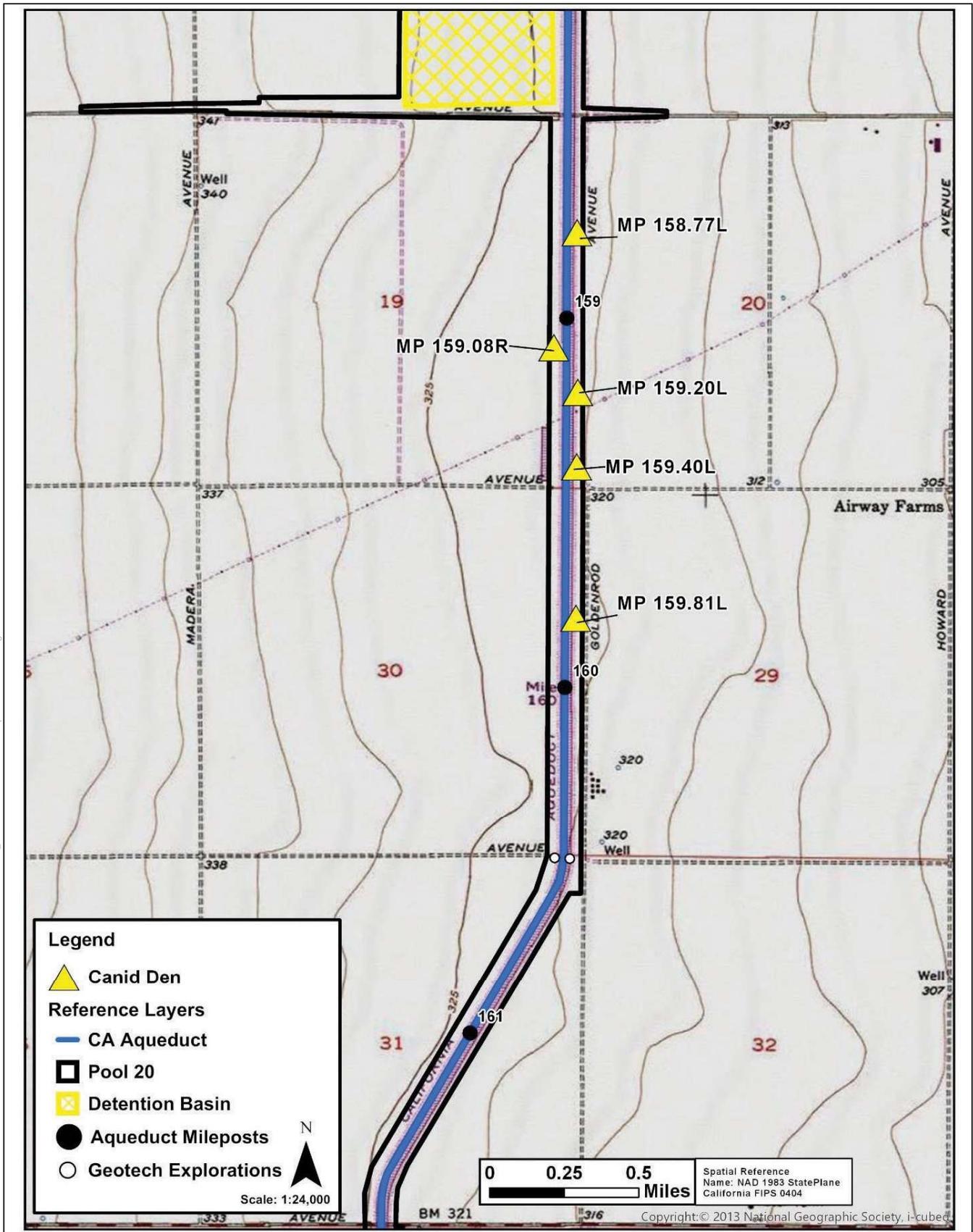
SOURCE: DWR, 2021; ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 42**  
2019 Survey Results of Dens and Burrow Locations MP 154.69 to MP 158.18



D:\70020.00 - DWI SoCal On-Call for Env Services\01 Active Contract Tasks\170020.24 - Subsidence Geotech\05 Graphics-GIS-Modeling\3 BRTR



SOURCE: DWR, 2021; ESA, 2021

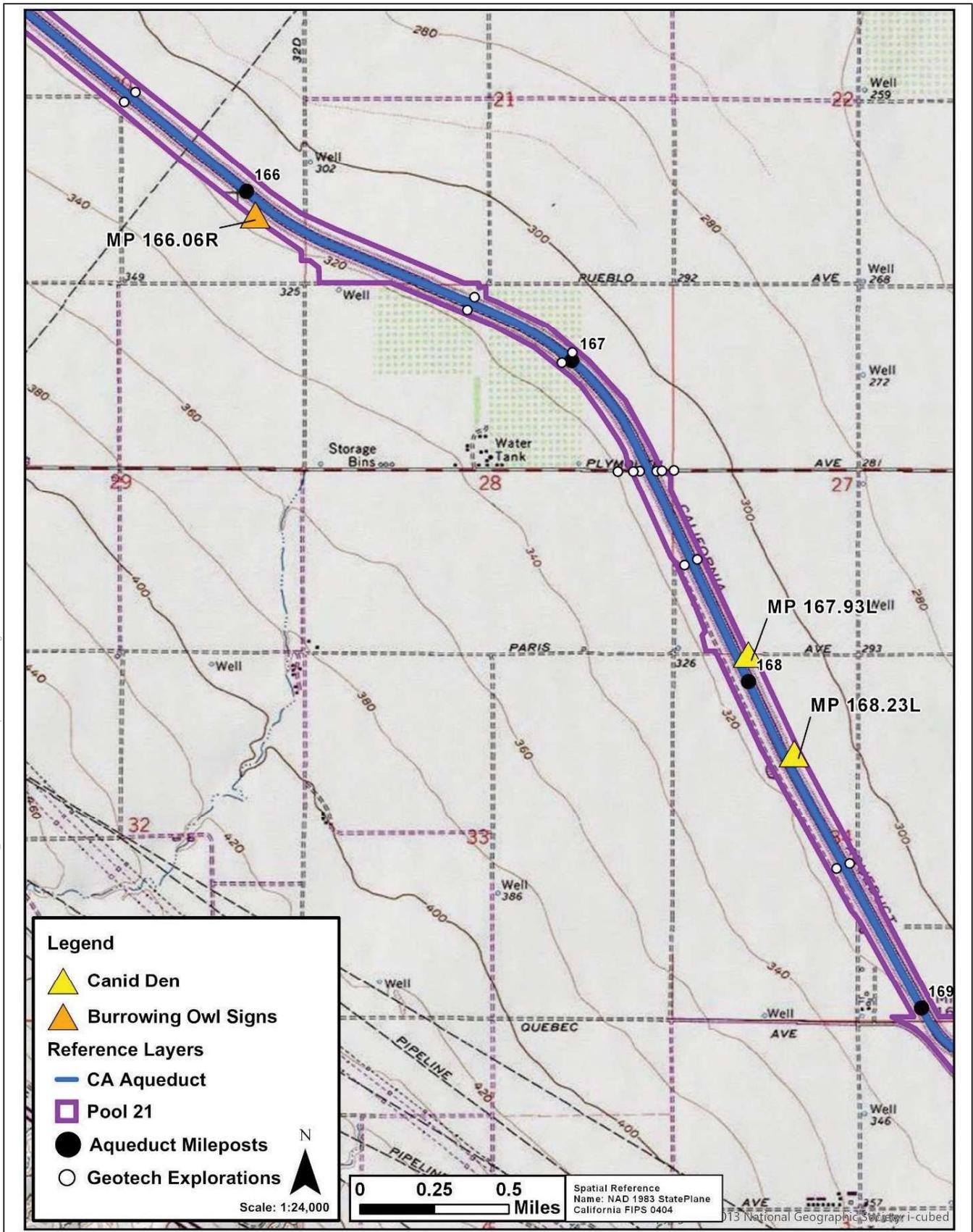
San Luis Canal Geotechnical Investigations Project

**Figure 43**  
2019 Survey Results of Dens and Burrow Locations MP 158.18 to MP 161.60





D:\770020.00 - DWIR SoCal On-Call for Env. Services\01 Active Contract Tasks\1770020.24 - Subsidence Geotech\05 Graphics-GIS-Modeling\3 BRTR

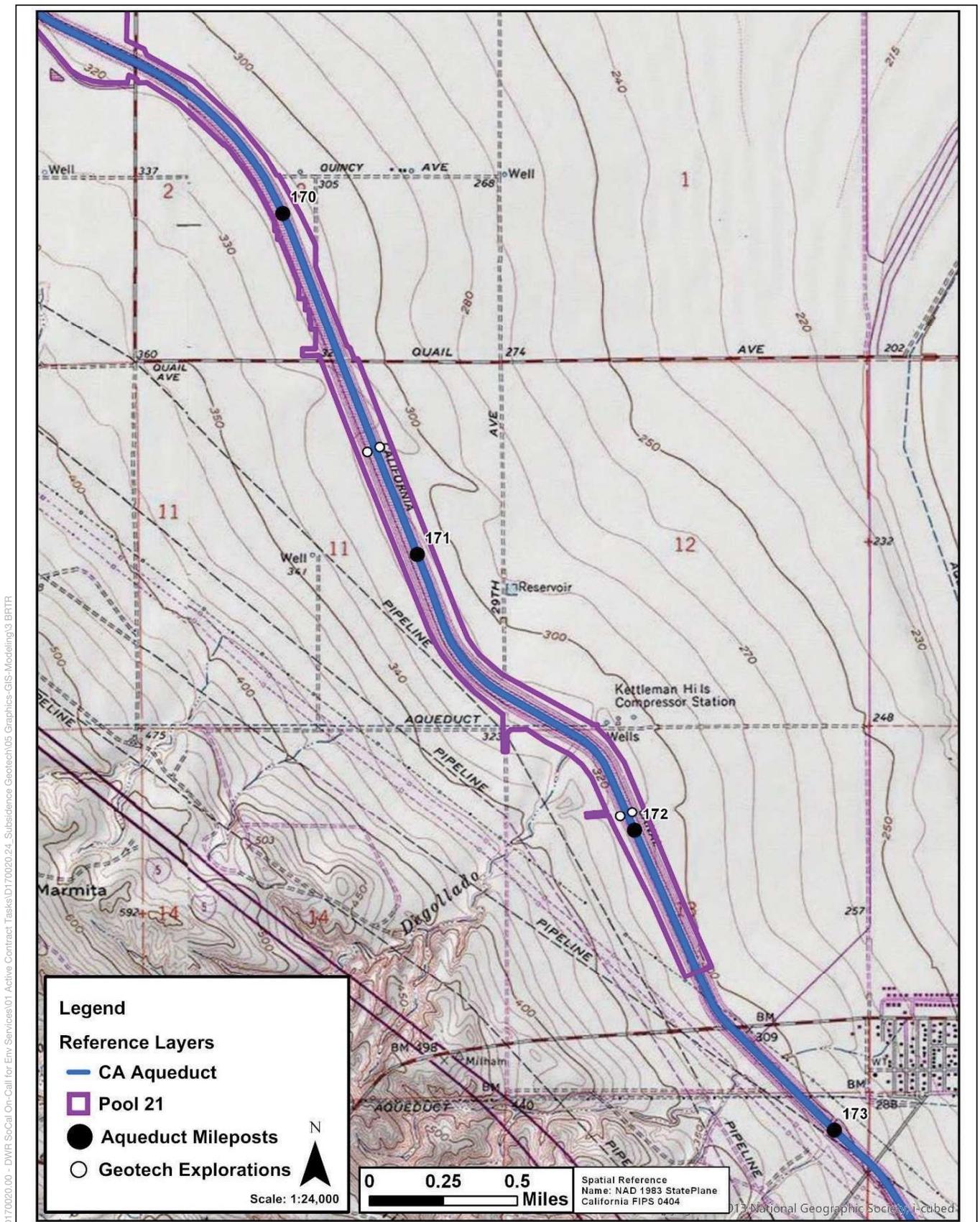


SOURCE: DWR, 2021; ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 45**  
2020 Survey Results of Dens and Burrow Locations MP 165.25 to MP 169.13





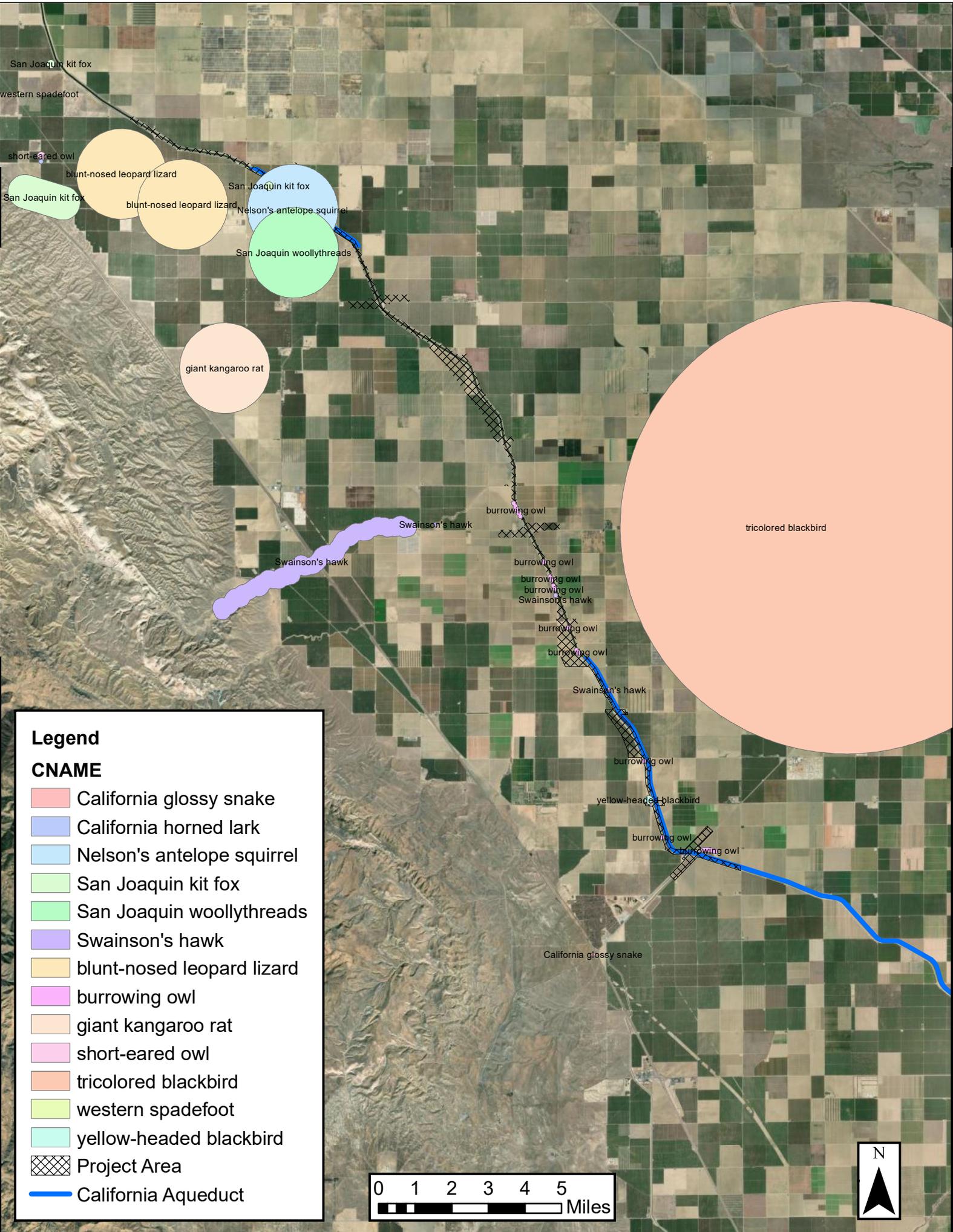
SOURCE: DWR, 2021; ESA, 2021

San Luis Canal Geotechnical Investigations Project

**Figure 46**  
2020 Survey Results of Dens and Burrow Locations MP 169.13 to MP 173.30



Appendix B  
**CNDDDB Records Within 3 Miles  
of the AOI**

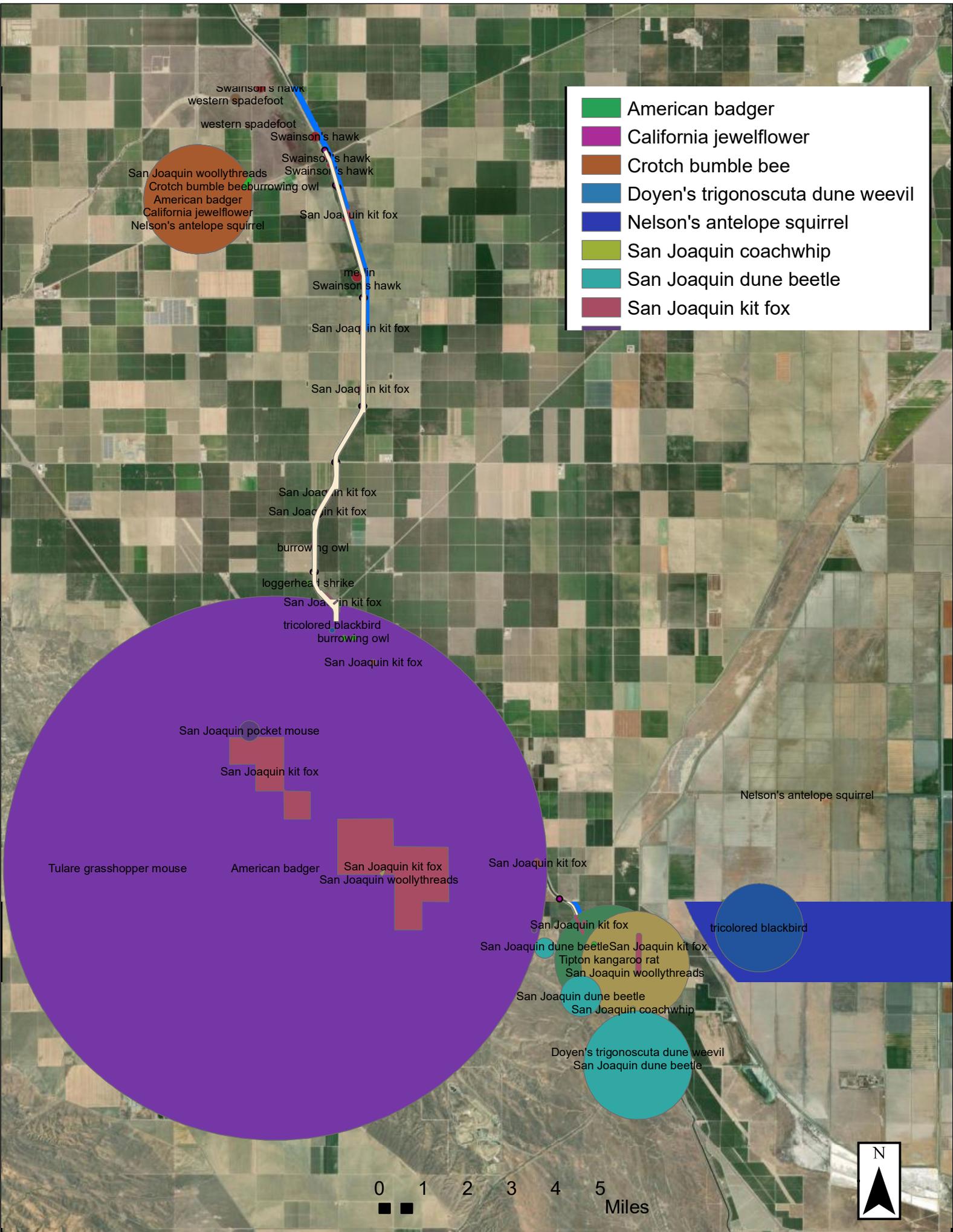


**Legend**

**CNAME**

- California glossy snake
- California horned lark
- Nelson's antelope squirrel
- San Joaquin kit fox
- San Joaquin woollythreads
- Swainson's hawk
- blunt-nosed leopard lizard
- burrowing owl
- giant kangaroo rat
- short-eared owl
- tricolored blackbird
- western spadefoot
- yellow-headed blackbird
- Project Area
- California Aqueduct





- American badger
- California jewelflower
- Crotch bumble bee
- Doyen's trigonoscuta dune weevil
- Nelson's antelope squirrel
- San Joaquin coachwhip
- San Joaquin dune beetle
- San Joaquin kit fox

Swainson's hawk  
western spadefoot  
western spadefoot  
Swainson's hawk  
Swainson's hawk  
Swainson's hawk  
San Joaquin woollythreads  
Crotch bumble bee  
American badger  
California jewelflower  
Nelson's antelope squirrel  
San Joaquin kit fox

Swainson's hawk  
Swainson's hawk  
San Joaquin kit fox  
San Joaquin kit fox

San Joaquin kit fox  
San Joaquin kit fox  
burrowing owl  
loggerhead shrike  
San Joaquin kit fox  
tricolored blackbird  
burrowing owl  
San Joaquin kit fox

San Joaquin pocket mouse  
San Joaquin kit fox  
Tulare grasshopper mouse  
American badger  
San Joaquin kit fox  
San Joaquin woollythreads

Nelson's antelope squirrel  
San Joaquin kit fox  
San Joaquin kit fox  
San Joaquin dune beetle  
San Joaquin kit fox  
Tipton kangaroo rat  
San Joaquin woollythreads  
San Joaquin dune beetle  
San Joaquin coachwhip  
Doyen's trigonoscuta dune weevil  
San Joaquin dune beetle

tricolored blackbird



Appendix C  
**USFWS Listed Species and  
Sensitive Resources of  
Considered for Potential Impact**

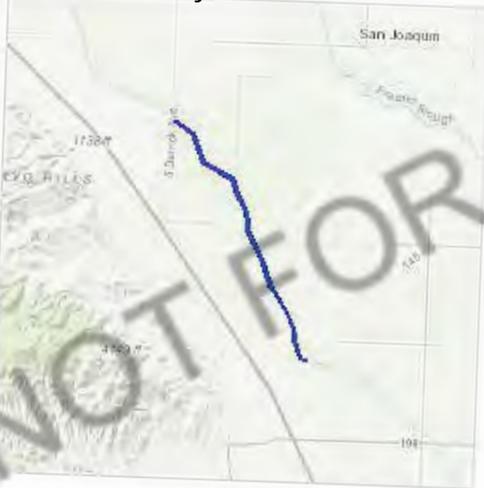
# IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

## Location

Fresno County, California



## Local office

Sacramento Fish And Wildlife Office

☎ (916) 414-6600

📠 (916) 414-6713

Federal Building  
2800 Cottage Way, Room W-2605  
Sacramento, CA 95825-1846

# Endangered species

**This resource list is for informational purposes only and does not constitute an analysis of project level impacts.**

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species<sup>1</sup> and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries<sup>2</sup>).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information.
2. [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.

The following species are potentially affected by activities in this location:

## Mammals

NAME

STATUS

Fresno Kangaroo Rat <i>Dipodomys nitratoides exilis</i>	Endangered
There is <b>final</b> critical habitat for this species. Your location is outside the critical habitat. <a href="https://ecos.fws.gov/ecp/species/5150">https://ecos.fws.gov/ecp/species/5150</a>	
Giant Kangaroo Rat <i>Dipodomys ingens</i>	Endangered
No critical habitat has been designated for this species. <a href="https://ecos.fws.gov/ecp/species/6051">https://ecos.fws.gov/ecp/species/6051</a>	
San Joaquin Kit Fox <i>Vulpes macrotis mutica</i>	Endangered
No critical habitat has been designated for this species. <a href="https://ecos.fws.gov/ecp/species/2873">https://ecos.fws.gov/ecp/species/2873</a>	

## Birds

NAME	STATUS
California Condor <i>Gymnogyps californianus</i>	Endangered
There is <b>final</b> critical habitat for this species. Your location is outside the critical habitat. <a href="https://ecos.fws.gov/ecp/species/8193">https://ecos.fws.gov/ecp/species/8193</a>	

## Reptiles

NAME	STATUS
Blunt-nosed Leopard Lizard <i>Gambelia silus</i>	Endangered
No critical habitat has been designated for this species. <a href="https://ecos.fws.gov/ecp/species/625">https://ecos.fws.gov/ecp/species/625</a>	
Giant Garter Snake <i>Thamnophis gigas</i>	Threatened
No critical habitat has been designated for this species. <a href="https://ecos.fws.gov/ecp/species/4482">https://ecos.fws.gov/ecp/species/4482</a>	

## Amphibians

NAME	STATUS
California Red-legged Frog <i>Rana draytonii</i>	Threatened
There is <b>final</b> critical habitat for this species. Your location is outside the critical habitat. <a href="https://ecos.fws.gov/ecp/species/2891">https://ecos.fws.gov/ecp/species/2891</a>	
California Tiger Salamander <i>Ambystoma californiense</i>	Threatened
There is <b>final</b> critical habitat for this species. Your location is outside the critical habitat. <a href="https://ecos.fws.gov/ecp/species/2076">https://ecos.fws.gov/ecp/species/2076</a>	

## Fishes

NAME	STATUS
Delta Smelt <i>Hypomesus transpacificus</i> There is <b>final</b> critical habitat for this species. Your location is outside the critical habitat. <a href="https://ecos.fws.gov/ecp/species/321">https://ecos.fws.gov/ecp/species/321</a>	Threatened

## Crustaceans

NAME	STATUS
Vernal Pool Fairy Shrimp <i>Branchinecta lynchi</i> There is <b>final</b> critical habitat for this species. Your location is outside the critical habitat. <a href="https://ecos.fws.gov/ecp/species/498">https://ecos.fws.gov/ecp/species/498</a>	Threatened

## Flowering Plants

NAME	STATUS
San Joaquin Woolly-threads <i>Monolopia (=Lembertia) congdonii</i> No critical habitat has been designated for this species. <a href="https://ecos.fws.gov/ecp/species/3746">https://ecos.fws.gov/ecp/species/3746</a>	Endangered

## Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

## Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act<sup>1</sup> and the Bald and Golden Eagle Protection Act<sup>2</sup>.

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Measures for avoiding and minimizing impacts to birds <http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Nationwide conservation measures for birds <http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf>

MIGRATORY BIRD INFORMATION IS NOT AVAILABLE AT THIS TIME

### **Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.**

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) and/or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

### **What does IPaC use to generate the migratory birds potentially occurring in my specified location?**

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [AKN Phenology Tool](#).

### **What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?**

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

### **How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?**

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds](#)

[guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

### What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

### Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

### What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

### Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize

potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

## Facilities

### National Wildlife Refuge lands

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

### Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

### Wetlands in the National Wetlands Inventory

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

#### FRESHWATER EMERGENT WETLAND

[PEM1Kx](#)

[PEM1C](#)

[PEM1Ch](#)

[PEM1Ax](#)

#### FRESHWATER POND

[PUBFx](#)

[PUSAx](#)

[PUSCh](#)

RIVERINE

[R2UBHx](#)[R2UBF](#)[R4SBCx](#)

A full description for each wetland code can be found at the [National Wetlands Inventory website](#)

### Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

### Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

### Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

# IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

## Location

Fresno and Kings counties, California



## Local office

Sacramento Fish And Wildlife Office

☎ (916) 414-6600

📠 (916) 414-6713

Federal Building  
2800 Cottage Way, Room W-2605  
Sacramento, CA 95825-1846

# Endangered species

**This resource list is for informational purposes only and does not constitute an analysis of project level impacts.**

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species<sup>1</sup> and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries<sup>2</sup>).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. [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.

The following species are potentially affected by activities in this location:

## Mammals

NAME

STATUS

Giant Kangaroo Rat *Dipodomys ingens* Endangered

Wherever found

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/6051>

San Joaquin Kit Fox *Vulpes macrotis mutica* Endangered

Wherever found

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/2873>

Tipton Kangaroo Rat *Dipodomys nitratoide nitratoide* Endangered

Wherever found

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/7247>

## Reptiles

NAME

STATUS

Blunt-nosed Leopard Lizard *Gambelia silus* Endangered

Wherever found

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/625>

Giant Garter Snake *Thamnophis gigas* Threatened

Wherever found

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/4482>

## Amphibians

NAME

STATUS

California Red-legged Frog *Rana draytonii* Threatened

Wherever found

There is **final** critical habitat for this species. The location of the critical habitat is not available.

<https://ecos.fws.gov/ecp/species/2891>

California Tiger Salamander *Ambystoma californiense* Threatened

There is **final** critical habitat for this species. The location of the critical habitat is not available.

<https://ecos.fws.gov/ecp/species/2076>

## Fishes

NAME

STATUS

**Delta Smelt** *Hypomesus transpacificus*

Threatened

Wherever found

There is **final** critical habitat for this species. The location of the critical habitat is not available.

<https://ecos.fws.gov/ecp/species/321>

## Crustaceans

NAME

STATUS

**Vernal Pool Fairy Shrimp** *Branchinecta lynchi*

Threatened

Wherever found

There is **final** critical habitat for this species. The location of the critical habitat is not available.

<https://ecos.fws.gov/ecp/species/498>

## Flowering Plants

NAME

STATUS

**California Jewelflower** *Caulanthus californicus*

Endangered

Wherever found

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/4599>

**San Joaquin Woolly-threads** *Monolopia (=Lembertia) congdonii*

Endangered

Wherever found

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/3746>

## Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

## Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act<sup>1</sup> and the Bald and Golden Eagle Protection Act<sup>2</sup>.

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Measures for avoiding and minimizing impacts to birds <http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Nationwide conservation measures for birds <http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf>

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the [FAQ below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME

BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

Golden Eagle *Aquila chrysaetos*

Breeds Jan 1 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

<https://ecos.fws.gov/ecp/species/1680>

**Lawrence's Goldfinch** *Carduelis lawrencei*

Breeds Mar 20 to Sep 20

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9464>

**Mountain Plover** *Charadrius montanus*

Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/3638>

**Tricolored Blackbird** *Agelaius tricolor*

Breeds Mar 15 to Aug 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/3910>

## Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

### Probability of Presence ( )

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is  $0.25/0.25 = 1$ ; at week 20 it is  $0.05/0.25 = 0.2$ .
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

### Breeding Season ( )

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

### Survey Effort (↑)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

### No Data (→)

A week is marked as having no data if there were no survey events for that week.

### Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

**Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.**

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

**What does IPaC use to generate the migratory birds potentially occurring in my specified location?**

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [AKN Phenology Tool](#).

**What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?**

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

## How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

## What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

## Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

## What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

## Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting

point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

## Facilities

### National Wildlife Refuge lands

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

### Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

### Wetlands in the National Wetlands Inventory

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND

[PEM1Cx](#)

FRESHWATER POND

[PUBKx](#)

RIVERINE

[R2UBHx](#)

[R4SBCx](#)[R5UBF](#)[R4SBC](#)

A full description for each wetland code can be found at the [National Wetlands Inventory website](#).

### Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

### Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

### Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

# Appendix D

## **Focused Survey Results**

**Western Burrowing Owl Survey Report**  
**for the**  
**Cantua Creek Stream Group Improvements Project**  
**Cantua Creek Sediment Removal Project—**  
**Notification No. 1600-2015-0069-R4**

August 2016



## **Project Description**

The California Department of Water Resources' (DWR) proposed Cantua Creek Stream Group Improvements Project (Project) is located on the west side of the California Aqueduct (Aqueduct) along an approximate 13-mile stretch in western Fresno County between Clarkson Avenue and Oakland Avenue. It is approximately 18 miles north of the City of Coalinga and 36 miles southwest of Fresno (Figure 1). The Project area consists of 165 acres that are divided into four floodwater basins between Aqueduct mileposts (MP) 128.48 and 141.60. Project features include flood easement acquisition and raising portions of the Aqueduct embankment and raising some roads; the construction features proposed in each basin are depicted in Figure 2 through Figure 5. Most of the work will be done in approximately eight miles of the southern portion of the Project area.

Project details are described in the *Cantua Creek Stream Group Improvements Project Final Initial Study/Mitigated Negative Declaration* (MND) (State Clearinghouse Number 2014091063) and in the September 8, 2015 Stream Alteration Agreement for the Cantua Creek Sediment Removal Project (SAA) (Notification No. 1600-2015-0069-R4).

The Project will begin in September 2016 and is expected to be completed by the end of January 2017. All work will take place during daylight hours, beginning after 0600 and ending by 1730 each day.

## **Vegetation**

According to *A Manual of California Vegetation* (Sawyer et al. 2009), the overall Project area can most closely be described as California annual grassland. This classification is dominated by annual grasses and herbs. According to the description, this series is composed of many non-native and native annual species, and composition varies among stands. Photos of typical habitat in the Project area are in Appendix A.

Habitat within the narrow Aqueduct right-of-way in the Project area has disturbed soils and is mostly ruderal with scattered areas containing non-native grasses, barren areas, or marginal quail bush scrub habitat. The ruderal habitat present on the western Aqueduct embankment is composed primarily of foxtail brome (*Bromus madritensis*), ripgut (*Bromus diandrus*), Russian thistle (*Salsola tragus*), fiddleneck (*Amsinckia sp.*), and heron's bill (*Erodium spp.*), with localized, dense thickets of quail bush (*Atriplex lentiformis*) (dead and alive) and mulefat (*Baccharis salicifolia*). Thickets of cattails (*Typha spp.*) are present where adjacent farmland ponds have encroached.

In areas where California annual grassland is present on the embankments, vegetation is typically 0 to 12 inches in height. Mowing, grading, and herbicide application occur annually on the embankments.

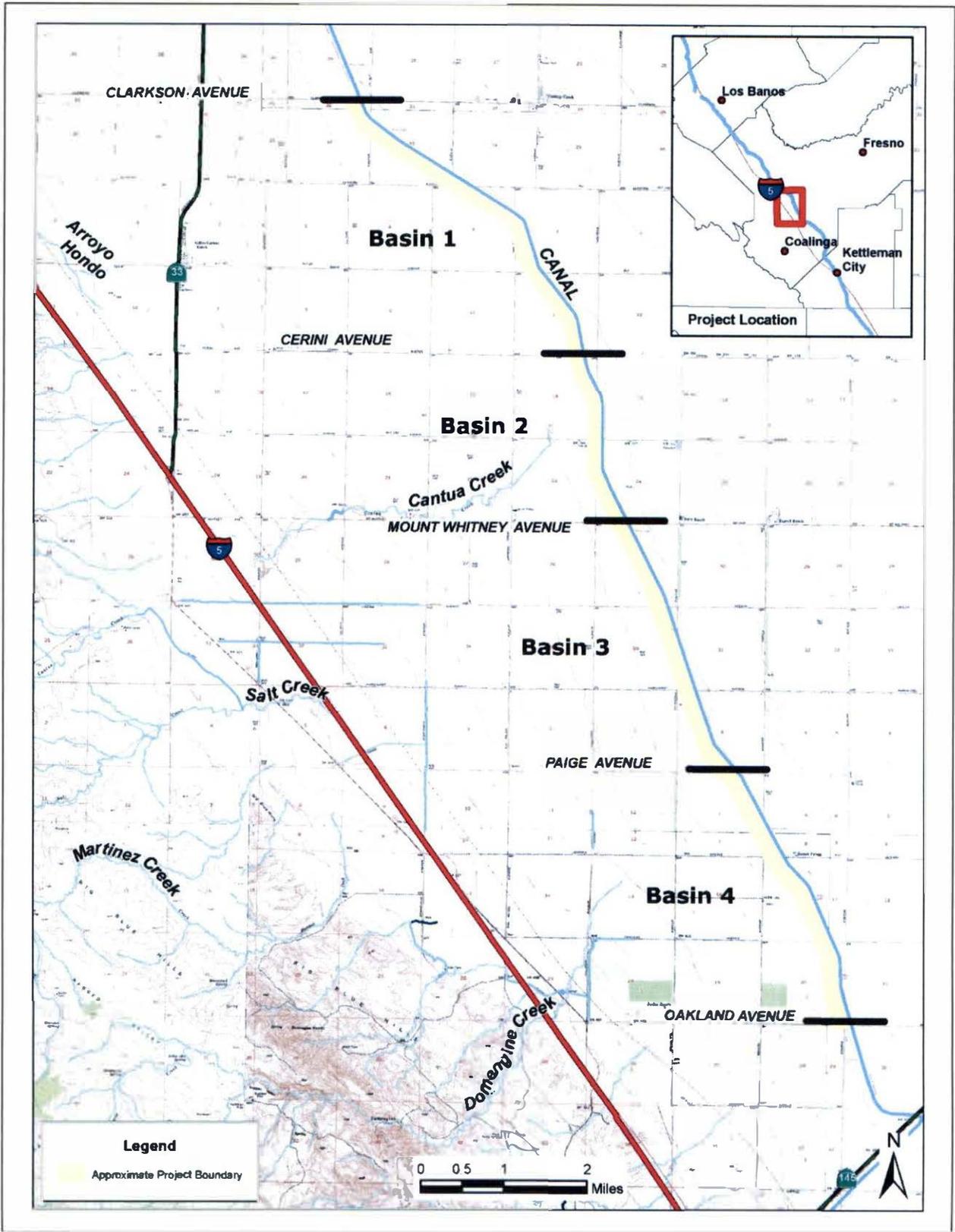


Figure 1. Project Location and Basins

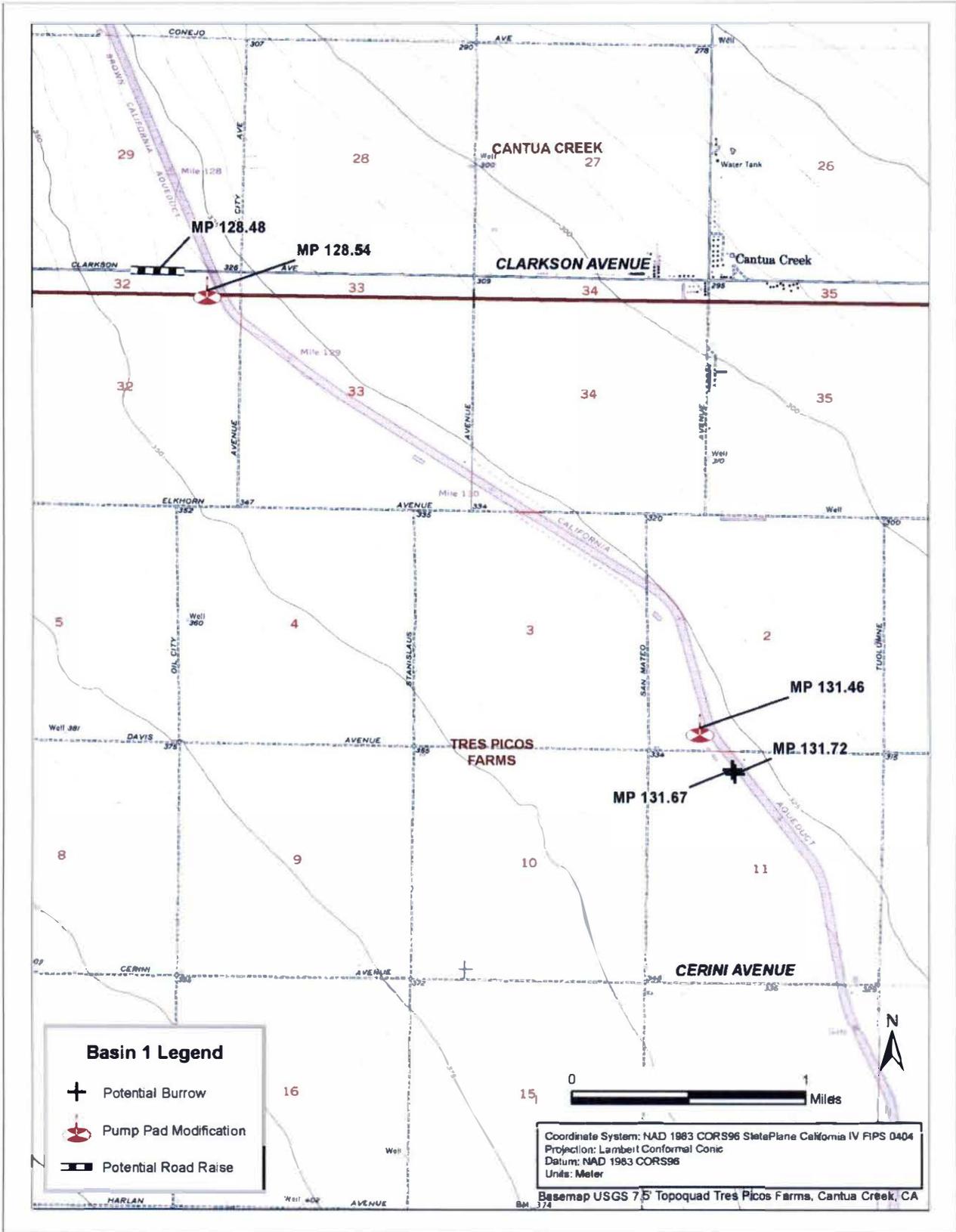


Figure 2. 2016 Basin 1 Burrowing Owl Observations and Project Details

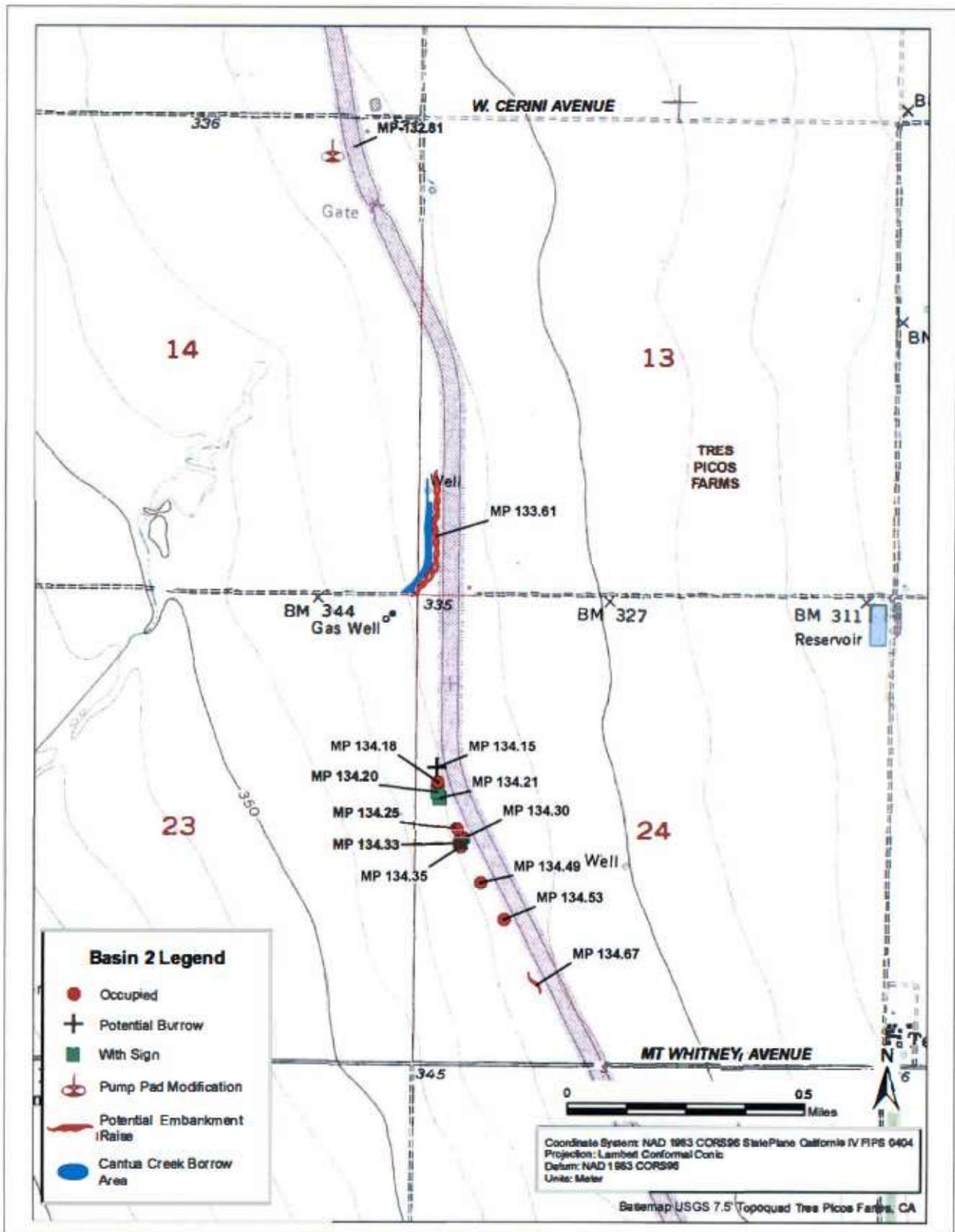


Figure 3. 2016 Basin 2 Burrowing Owl Observations and Project Details

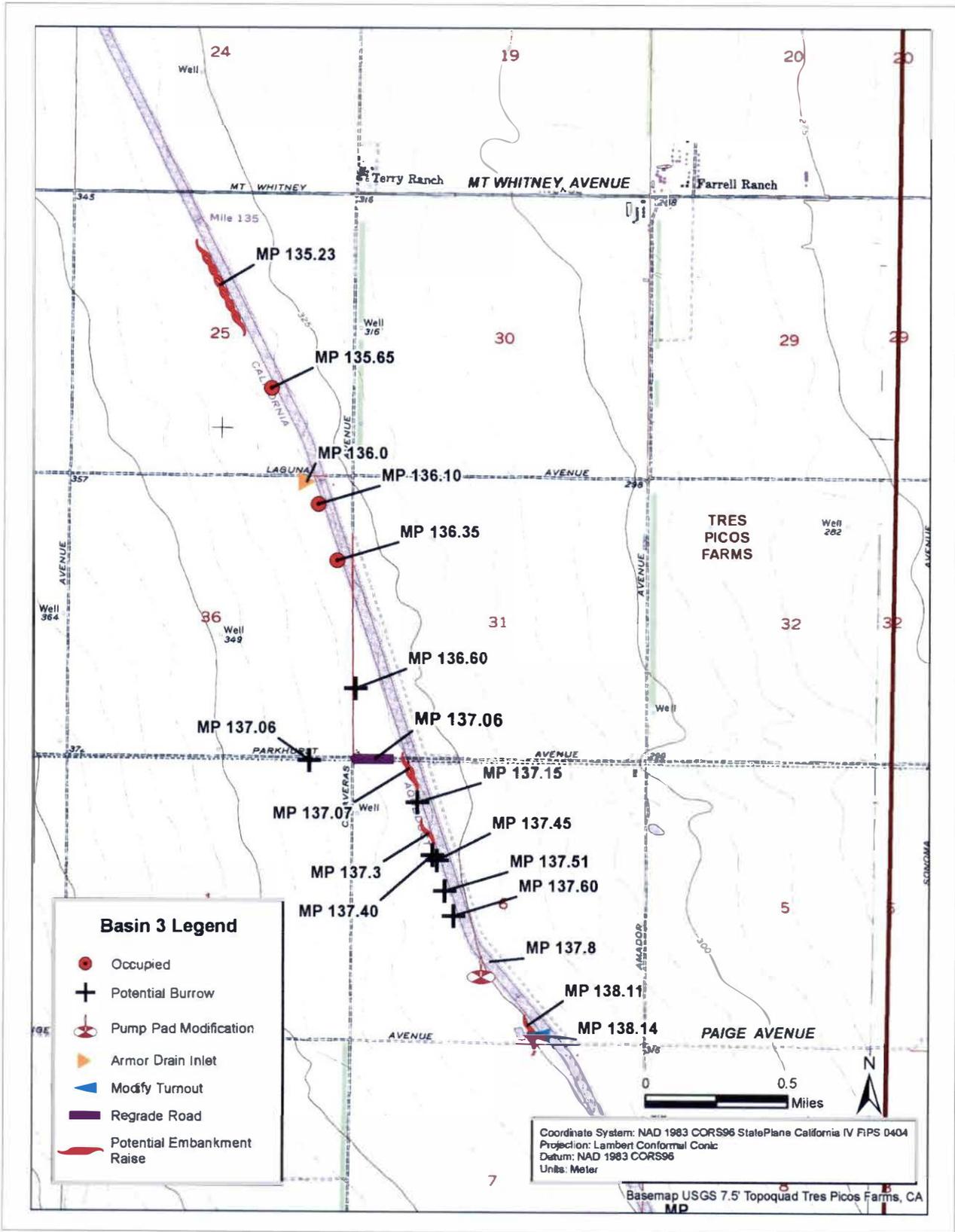


Figure 4. 2016 Basin 3 Burrowing Owl Observations and Project Details

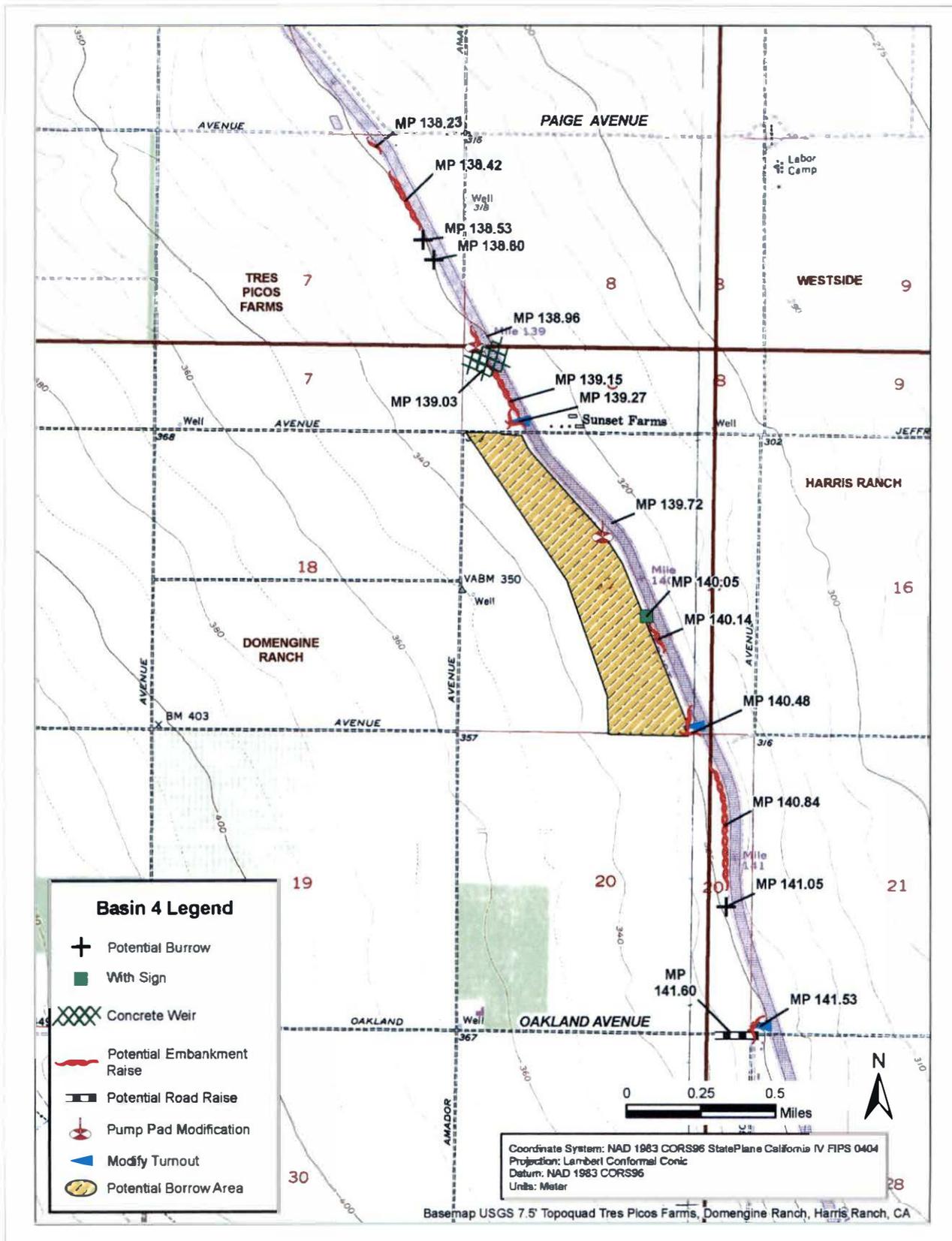


Figure 5. 2016 Basin 4 Burrowing Owl Observations and Project Details

## **Wildlife**

Wildlife species observed in this area include Western burrowing owl (*Athene cunicularia*: BUOW), California ground squirrel (*Spermophilus beecheyi*), desert cottontail (*Sylvilagus audubonii*), coyote (*Canis latrans*), Swainson's hawk (*Buteo swainsoni*), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), great horned owl (*Bubo virginianus*), barn owl (*Tyto alba*), black necked stilts (*Himantopus mexicanus*), killdeer (*Charadrius vociferous*), corvids (*Corvus sp.*), multiple species of songbirds (*Passeriformes*), garter snake (*Thamnophis sp.*), as well as evidence of pocket gophers (*Geomyidae*) and other small mammal species.

Of these species, the hawks, owls, coyotes, and snakes are considered natural predators of the BUOW. The greatest threats to the owls are likely agricultural pesticides, herbicides, and potential strike from passing vehicles and equipment.

### Historical Use and Occupancy of BUOW in the Project Area

Adjacent agricultural fields provide cover and food for small mammals and a food source for BUOW. Large ground squirrel burrows are present on the Aqueduct embankments, creating potential shelter for BUOW. Ground squirrel burrows, badger burrows, and canid dens are generally less abundant in the northern portion of the Project area.

Roads along the Aqueduct and on top of the embankments are frequently used by an assortment of entities including public agencies, private land owners, fishermen, and trespassers. Even though burrows may be located within 5 to 15 feet of the roads, BUOW have adapted to daily vehicle traffic on them.

According to the DFW California Natural Communities Database (CNDDDB, June 2016), BUOW have been observed using various burrows in the embankments on the west side of the Aqueduct between W. Mount Whitney Avenue and W. Oakland Avenue. One BUOW was observed in this area in January 2001, seven were observed in September 2002, and three were observed between May and June of 2005.

From 2012 to 2015, DWR Environmental Scientists (ES) observed BUOW in the Project area along the west side of the Aqueduct during informal BUOW surveys and during site visits to the area for unrelated projects (Table 1). For the purposes of this report, informal observations are defined as observations that occurred on days when protocol level BUOW surveys were not being performed. The CNDDDB Field Survey Forms have been submitted to DFW, and are included in Appendix B.

**Table 1. 2012 to 2015 Informal BUOW Observations**

Date	BUOW Individuals	BUOW Adult Pair	Basin (Figure 1)
November 2, 2012	1 Adult		2
March 7, 2013	2 Adults		2
March 7, 2013	1 Adult		4
October 8, 2013	1 Adult		3
February 2, 2014	1 Adult		3
March 2, 2015		1	3
October 22, 2015	1 Adult		1 (the only sighting on east side of Aqueduct; no burrow.)
October 23, 2015	3 Adults		1
October 29, 2015	2 Adults		4
October 29, 2015	1 Adult		0.25 miles south of Basin 4*
December 15, 2015		1	3
December 15, 2015	2 Adult		3
December 16, 2015	1 Adult		1
December 16, 2015	2 Adults		2

\*This burrow is outside the Project area.

## 2016 BUOW Survey Methods and Results

### Methods

Surveys were conducted in accordance with the 2012 *Staff Report on Burrowing Owl Mitigation* (Staff Report) breeding season survey protocol in Appendix D (DFW 2012); this report was written in compliance with the reporting requirements. All surveys were conducted between civil morning twilight and 1000 or between two hours before sunset and civil evening twilight.

On March 8, 2016, a reconnaissance survey was performed prior to conducting the breeding season surveys to assist in identifying occupied burrows, potential burrows, and any signs associated with them. When potential burrows were found, a stake was placed on the top of the embankment where it could easily be detected from the main road. An approximate milepost location was written on the stakes to keep location identification consistent for data collection; each burrow location was recorded with a Trimble® Juno® Global Positioning System unit.

Surveys were conducted from March 10 to June 23; four protocol level BUOW surveys were conducted in the Project area (Table 2). All surveys were limited to the west side of the Aqueduct embankments and toe roads where construction and site access will occur (between MP127.83 and MP 143.12). Surveys also occurred along Clarkson, Parkhurst, and Oakland Avenues where road raises or grading would occur (see Figure 2 through Figure 5). A survey of the entire Project area took 3 to 5 days to complete (Table 2).

**Table 2. Survey Distribution**

Date	Survey No.	Time	Basin Surveyed	Surveyor
March 10, 2016	1	0610 - 0957	Part of 4	DWR ES Christa Collin and DWR Scientific Aid Jennifer Bohling
March 21, 2016	1	1711 - 1934	Part of 3 and Remainder of 4	DWR ES Laura Castro and DWR Senior ES Terry Ely
March 22, 2016	1	1714 - 1937	Part of 2 and Remainder of 3	DWR ES Laura Castro and DWR Senior ES Terry Ely
March 23, 2016	1	1739 - 1918	Part of 1 and Remainder of 2	DWR ES Laura Castro and DWR Senior ES Terry Ely
March 24, 2016	1	1758 - 1840	Remainder of 1	DWR ES Laura Castro and DWR Senior ES Terry Ely
April 25, 2016	2	1740 - 2008	All of 1	DWR ES Laura Castro and DWR Senior ES Terry Ely
April 26, 2016	2	0630 - 1004	All of 2 and Part of 3	DWR ES Laura Castro and DWR Senior ES Terry Ely
April 26, 2016	2	1756 - 1957	Remainder of 3	DWR ES Laura Castro and DWR Senior ES Terry Ely
April 27, 2016	2	0658 - 1000	All of 4	DWR ES Laura Castro and DWR Senior ES Terry Ely
May 23, 2016	3	1819 - 2005	Part of 4	DWR ES Laura Castro and DWR Senior ES Terry Ely
May 24, 2016	3	0659 - 0956	Part of 3 and Remainder of 4	DWR ES Laura Castro and DWR Senior ES Terry Ely
May 24, 2016	3	1810 - 2018	Part of 2 and Remainder of 3	DWR ES Laura Castro and DWR Senior ES Terry Ely
May 25, 2016	3	0732 - 0925	All of 1 and Remainder of 2	DWR ES Laura Castro and DWR Senior ES Terry Ely
June 21, 2016	4	1838 - 2036	All of 1 and Part of 2	DWR ES Laura Castro and DWR Senior ES Terry Ely
June 22, 2016	4	0738 - 0959	Remainder of 2 and Part of 3	DWR ES Laura Castro and DWR Senior ES Terry Ely
June 22, 2016	4	1839 - 2039	Remainder of 3 and Part of 4	DWR ES Laura Castro and DWR Senior ES Terry Ely
June 23, 2016	4	0737 - 0949	Remainder of 4	DWR ES Laura Castro and DWR Senior ES Terry Ely

Windshield surveys were primarily conducted; however, windshield surveys were only done in areas where the surrounding area was clearly visible from the vehicle. Transects were performed where windshield surveys were not adequate to determine presence of BUOW or burrows; transects were spaced 25 to 60 feet apart, depending on topography and vegetation height and density.

The MP, signs of BUOW heard or observed, number of BUOW present, life stage, behavior, description of habitat, vegetation height, surrounding land use, position of burrow on the embankment, transect spacing, predators observed, and any notes were recorded on data sheets (Appendix C).

## Results

In 2016, several informal observations of BUOW were documented during protocol level Swainson's hawk (SWHA) surveys. Observations were also documented during the reconnaissance survey on March 8, 2016 and during other site visits (Table 3). During the reconnaissance survey, BUOW were observed at two locations, both in Basin 3 (Table 3, Figure 4). BUOW were perched at the burrow entrance.

Four informal BUOW observations occurred in early April 2016 during SWHA surveys. One observation was in Basin 1, the second was in Basin 2, and the two others were in Basin 3 (Table 3, Figures 2, 3, and 4). Most BUOW were either perched on a stake or perched at the burrow; however, on April 5, 2016, a BUOW was observed standing on the ground on the east side of the Aqueduct at MP 132.51. This BUOW was on an embankment where no burrow was present. The BUOW was observed from a distance and it was difficult to tell if it was an adult or juvenile. It possibly had downy feathers.

**Table 3. 2016 Informal BUOW Observations**

Date	BUOW Individuals	BUOW Adult Pair	Basin (Figure 1)	MP	Activity
March 8, 2016	1		3	135.65	reconnaissance
	1		3	136.10	reconnaissance
April 5, 2016	1 Juvenile(?)*		1	132.51	SWHA survey
April 6, 2016	1 Adult		2	134.30	SWHA survey
April 12, 2016	1 Adult		3	135.65	SWHA survey
	1 Adult		3	136.35	SWHA survey
May 5, 2016	1 Adult		3	136.10	SWHA survey
May 10, 2016	1 Adult		3	136.10	SWHA survey
June 1, 2016		1	3	136.10	site visit
June 6, 2016	1 Adult		3	136.10	SWHA survey
July 7, 2016	2 Nestlings	1	3	135.65	SWHA survey
July 19, 2016	3 Nestlings	1	3	135.65	SWHA survey
July 22, 2016	3 Nestlings	1	3	135.65	SWHA survey
August 2, 2016	1 Adult, 3 Nestlings		3	135.65	SWHA survey
August 17 and 18, 2016	1 Adult, 2 Juveniles		3	135.65	preconstruction survey
August 17 and 18, 2016	1 Adult, 1 Juvenile		3	136.10	preconstruction survey

\*BUOW was observed from a distance and possibly had downy feathers.

During 2016 protocol surveys, BUOW were observed in Basin 2 and Basin 3. Table 4 summarizes BUOW data gathered in Basin 2 during the 2016 breeding season protocol level surveys. Observations that occurred on the day of a survey, but occurred before the recorded start time or after the recorded survey end time, are noted. No BUOW were observed in Basin 2 during surveys 2, 3, and 4. Table 5 summarizes BUOW data gathered in Basin 3. No BUOW were observed in Basin 3 during survey 1.

**Table 4. 2016 BUOW Protocol Survey Basin 2 Results**

Burrow Location (MP)	Survey No. and Date	Time of Observation (morning/evening)
134.18	Survey No.1	
	March 22, 2016	morning**
	March 22, 2016	evening
	March 23, 2016	evening**
	March 24, 2016	evening**
134.25	Survey No.1	
	March 22, 2016	morning**
	March 24, 2016	evening**
134.35	Survey No.1	
	March 22, 2016	evening
	March 23, 2016	evening**
134.49	Survey No.1	
	March 22, 2016	evening
134.53	Survey No.1	
	March 22, 2016	morning**
	March 23, 2016	evening**
	March 24, 2016	evening**

\*\* BUOW observed outside of the designated survey period.

**Table 5. 2016 BUOW Protocol Survey Basin 3 Results**

Burrow Location (MP)	Survey No. and Date	Time of Observation (morning/evening)
136.10	<b>Survey No.2</b>	
	April 26, 2016	morning
	<b>Survey No.3</b>	
	May 24, 2016	evening
	<b>Survey No.4</b>	
	June 22, 2016	morning
	June 22, 2016	evening**

\*\* BUOW observed outside of the designated survey period.

Protocol level BUOW breeding season surveys and informal observations in 2016 resulted in the detection of 13 potential burrows that had no signs of BUOW use, 4 burrows with signs of use but with no BUOW, and 9 burrow locations where BUOW were observed or were within 115 feet of a burrow. Twenty-six locations had burrows that could have provided suitable shelter for BUOW.

No evidence of predation or vehicle strikes of BUOW was observed during informal observations or during protocol level surveys; however two burrows, located at MP 134.33 and MP 138.53, were found completely caved in during the fourth survey. A burrow at MP 131.95 that was occupied in spring of 2015 could no longer be found in the winter of 2015. Project area burrow observation results are depicted in Table 6. The 2016 protocol level survey results are depicted on Figure 2 through Figure 5.

During Survey 1, BUOW were observed at five different locations all in Basin 2 (Table 4, Figure 3). BUOWs were typically perched at the burrow entrance. At 4 of the locations, a BUOW fled from the burrow entrance when we approached. One BUOW was observed perched on the embankment approximately 105 feet from its burrow.

One sighting occurred during Survey 2; the observation was in Basin 3 (Table 5, Figure 4). This BUOW was perched on the stake above the burrow.

BUOW were observed once during Survey 3. The BUOW was at MP 136.10 (Table 5, Figure 4). However, informal observations of a single owl occurred at MP 136.10 on two other occasions in May 2016 during SWHA surveys (Table 3). During these observations, the BUOW was perched on the stake above the burrow. Although one bird was seen at a time, a pair was suspected since separate individual sightings at the same location indicated a dark colored BUOW and a light colored BUOW.

**Table 6. Project Area Burrow Observation Results**

Burrow Location (MP)	Potential Burrow	Burrow with Sign	Burrow Occupied by BUOW	Occupied at least once from 2013-2015
131.67	X			X
131.72	X			X
131.95				X*
134.15	X			
134.18			X	X
134.20		X		
134.21		X		X
134.25			X	
134.30			X	
134.33		X†		X
134.35			X	X
134.49			X	X
134.53			X	X
135.65			X	X
136.10			X	X
136.35			X	
136.60	X			
137.06	X			
137.15	X			
137.40	X			X
137.45	X			
137.51	X			
137.60	X			
138.53	X†			
138.60	X			
140.05		X		X
141.05	X			
<b>TOTAL</b>	<b>13</b>	<b>4</b>	<b>9</b>	<b>13</b>

\*Burrow was no longer present in winter 2015.

†Burrow found caved in during the June 2016 survey; burrow no longer supports BUOW occupancy.

Confirmation of the adult pair at MP 136.10 occurred on June 1, 2016 at 1515. Neither BUOW nor SWHA surveys were conducted on that date. An informal observation was also made on June 6 at this site of a single BUOW during SWHA surveys (Table 3).

On June 22, during Survey 4, a second sighting of the pair at MP 136.10 occurred at approximately 1830 while driving on the east side of the Aqueduct en route to the BUOW survey start point; however, this observation was made outside the designated survey period. Only one owl was observed on that day during the recorded protocol survey period. BUOW were not observed at any other location in June (Table 3 and 5, Figure 4).

On July 7, 2016 during a SWHA survey, DWR Environmental Scientists noticed that the BUOW pair at MP 136.10 had moved to a burrow north at MP 135.65. Two nestlings were observed at the burrow entrance between the hours of 1130 and 1230. Although nestlings were not observed at MP 136.10, the size of the nestlings and the mere two week lapse in time indicate that the adults moved to MP 135.65 with their young (Tables 3 and 5). The burrow at MP 135.65 was unoccupied in May and June. The move to a different burrow may have been triggered by non-DWR work that was occurring in the DWR right-of-way approximately 328 feet from the original burrow.

The BUOW were observed again at MP 135.65 during SWHA surveys on July 19, and 22, 2016 and on August 2, 2016 (Table 3). On July 19, a third nestling was observed. The pair and the three nestlings were observed between 0830 and 1000; one of the nestlings hopped on top of the embankment with its wings fluttering. On July 22, the three nestlings and one adult were observed at approximately 0905 from the east side of the Aqueduct. A second adult flew to the burrow from the agricultural field approximately 5 minutes later. Adults were sounding alarm calls because farm and other vehicles were consistently driving on top of the embankment above the burrow. The upper embankment road was subsequently closed off to equipment and vehicles by DWR San Luis Field Division staff because the vehicles were not supposed to use that road. On August 2, the three nestlings and one adult were observed at approximately 0905 while the Environmental Scientists were driving past the burrow. The adult was perched on the stake, one nestling was perched below the stake and the other two were on the back slope of the embankment, hiding with only their heads visible. The nestlings later hopped around and went in and out of the burrow. No calls were heard. At this point, nestlings were nearing adult size and downy feathers were not observed.

A preconstruction survey was conducted on August 17 and 18, 2016. BUOW were observed on both days at MP 135.65 and at MP 136.10 (Table 3). One adult and two juveniles were at the top of the embankment by the stake, on the stake, or at the burrow entrance at MP 135.65 on both days. One adult and one juvenile were observed at MP 136.10. No other BUOW were observed within the Project area during the preconstruction survey. No construction is expected to occur within 500 feet of the burrow at MP 135.65. Construction is expected to occur approximately 450 feet north of MP 136.10.

Photos of BUOW locations are located in Appendix A and copies of the Protocol Survey Data Sheets are in Appendix C.

Sixteen burrows that have been occupied at least once in the last three years are located in the Project area. None of the burrows recorded in the Project area are located within 150 feet of proposed construction activities; in accordance with the Staff Report, all burrows that have been occupied within the last three years must be presumed occupied. All of the burrows are near frequently used roads.

### **Minimization Measures**

Project construction has been scheduled to occur after the beginning of September 2016 and will be completed by the end of January 2017. This construction schedule was selected to reduce potential impacts to sensitive species, including BUOW.

To avoid potential impacts to BUOW and burrows, the following measures will be implemented:

- Preconstruction surveys will be conducted to determine if nesting BUOWs are still present.
- All work will take place during daylight hours, beginning after 0600 and ending by 1730 each day. Work at night will not be allowed unless DFW concurs.
- Environmental tailgates will be given to all construction personnel before the start of their first work day. The tailgate will cover identification of sensitive species and its habitat, conditions to minimize impacts, and the phone numbers of Environmental Scientists to call in the event sensitive species are seen or impacted.
- Vehicles and equipment will remain on existing roads.
- Between MP 135.63 and MP 136.13 where there are known occupied burrows, the speed limit will be restricted to 15 miles per hour. This area will be clearly marked. In all other areas, the speed limit will be restricted to 25 miles per hour.
- In compliance with the SAA, a minimum 150-foot radius buffer will be staked and maintained around all occupied burrows. Monitoring of BUOW burrows will occur during construction by a qualified biologist to determine the status of the BUOW at those locations. If other BUOW move into the project area, buffers will also be maintained around those burrows.
- Since work will occur during the non-breeding season and the Aqueduct is approximately 246 feet wide, the Aqueduct will provide an adequate disturbance buffer for any burrows located on the east side.
- If a qualified biologist determines that the established 150-foot radius buffer is not effective, or if construction requires a reduction in the buffer, a shelter-in-place will be

used if required by DFW to minimize impacts to BUOW. Installation would occur only from August through January.

- Shelter-in-place would consist of stacking hay bales, or another type of material such as fencing slats, at least 5 feet from the occupied burrow to create a visual and auditory barrier between construction and the burrow.
- Hay bales, if used, will be certified as weed-free and installation will be monitored by a qualified biologist.
- Increased monitoring will occur in areas where a shelter-in-place is used to determine its effectiveness. If impacts to the BUOW continue, adjustments would be made by a qualified biologist at the direction of DFW to further reduce impacts to the BUOW.
- Photographs of the shelter-in-place locations and construction occurring in the vicinity will be taken and submitted to DFW.
- The Environmental Scientist will be immediately notified if any burrow is damaged or destroyed.
- If avoidance of occupied burrows is infeasible during construction, DWR will immediately contact DFW. No burrows will be disturbed until DFW recommendations are in place.

**APPENDIX A**  
**Environmental Training Booklet**

Department of Water Resources

Cantua Creek Stream Group  
Improvements Project  
Environmental Training

September 2016

**Cantua Creek Stream Group Improvements  
Project Environmental Training**

California Department of Water Resources

**Contact info: Environmental Scientist  
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Prepared by DWR South Central Region Office

**September 2016**

## ENVIRONMENTAL TRAINING MEETING

### Biological Resources

Section 2080 of the California Fish and Game Code prohibits “take” of any State endangered or threatened species.

- ❖ The State definition of “take” under the California Endangered Species Act is to “hunt, pursue, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill” an endangered or threatened species. State penalties include up to \$10,000 and up to 1 year in prison, and civil penalties which include full restitution of damages.

Section 9 of the Federal Endangered Species Act prohibits the “take” of any federally listed endangered species by any person.

- ❖ The federal definition of “take” is to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct, including actions that damage or destroy endangered species habitat. Federal penalties include up to \$50,000 and up to 1 year in prison, and civil penalties which include full restitution of damages.

The Cantua Creek Stream Group Improvements Project has no permit for “take” of any federal- or State-listed threatened or endangered species, or State fully protected species. Therefore, restrictions to prevent “take” and other impacts are required.

There will be no “take” or other environmental impacts, if personnel follow these restrictions:

- All personnel on site will participate in an environmental education tailgate prior to commencing their work, including those participating in mobilization and demobilization, and will keep this pamphlet with them while working in the project area.
- Personnel, equipment, and vehicles will remain off the embankments, except where work is required.
- A 15 mile per hour speed limit will be maintained between MP 135.64 and 136.20 and on all unpaved roads.
- A 25 mile per hour speed limit will be maintained in all areas of the project, including haul routes and project access routes, except where slower speeds are required.
- Because of sensitive resources, staging and parking will not occur within the Cantua or Salt Creek channels or on top of any embankment.
- Turn around and park only in existing paved or graveled areas.
- Open pits or holes deeper than 2 feet must have an escape ramp (slope 2:1 or less) constructed of earthen fill or sandbags every 150 feet to allow animals to escape. These must be checked by the Inspector and in place at the end of each work day. Otherwise, the open areas must be completely covered before nightfall.
- All open pipes have to be capped or covered by the end of the day to avoid entrapping wildlife.
- Check for wildlife under vehicles and equipment before use.

- Concrete and grout can only be used in specified locations away from habitat and waterways (coordinate with the Environmental Scientist).
- Other than what is in the specifications, do not remove or damage any vegetation without environmental approval.
- A 150-foot buffer will be maintained around burrowing owl burrows, which are marked with yellow painted stakes (see photo).
- A 50-foot buffer will be maintained around burrows marked with blue painted stakes (see photo).
- Do not remove any stakes or other exclusion markers.
- Work will only occur during daylight hours.
- Employees are not allowed at the project site during nonworking hours.
- No pets, camping, firearms, or any other use of the right of way area is allowed.
- All trash will be contained and covered.
- Food-related trash, such as wrappers, cans, bottles, and scraps will be placed in closed containers and removed daily from work sites.
- If wildlife is encountered during work activity, it will be allowed to leave the area unharmed.
- An Environmental Scientist will be contacted immediately if a special status species is seen, trapped, injured, or killed. (see the following Species Photos and Accounts).

## Species Photos and Accounts

### Western Burrowing Owl (*Athene cunicularia*)



Santa Cruz Predatory Bird Research Group

Status: Federal Bird of Conservation Concern and State Species of Special Concern

Identifying Characteristics:

They are approximately 7 to 9 inches in height, and are often seen in the daytime, standing on the ground or on a post.

They have distinguishable white eyebrows and a white chin.

Habitat: Habitat typically includes low-growing vegetation.

Burrowing owls typically use old ground squirrel or other small mammal burrows, although they may excavate burrows in areas of soft soil. In locations where burrows are scarce, burrowing owls may also use man-made structures such as culverts.

They may use several burrows in an area for cover and nesting. Burrowing owls are known to move to different burrows or in and out of an area.

## San Joaquin kit fox (*Vulpes macrotis mutica*)



ESRP, CSU Stanislaus

CDFW

Status: Federally Endangered and State Threatened

Identifying Characteristics:

They weigh an average of 5 pounds and are similar in size to a small dog or large cat, and are distinguished from other members of the canid (dog) family by their large ears, long legs, and long bushy tail.

San Joaquin kit fox are primarily nocturnal, but they are sometimes seen during the day.

Habitat: Kit fox were historically found in semi-arid regions of California's Central Valley and adjacent foothills. Due to reductions in available habitat, they are now primarily found in the southern San Joaquin Valley.

A mated kit fox pair may use up to 39 dens within a year. Kit fox either dig these dens themselves or enlarge existing squirrel or badger dens.

Natal (pupping) dens are generally the largest and most complex type of den and may be constructed over a period of several years. Kit fox are also known to use manmade structures such as small-diameter culverts.

## Giant Kangaroo Rat (*Dipodomys ingens*)



Mark A. Chappell

Status: Federally and California Endangered

Identifying Characteristics:

The giant kangaroo rat is the largest of the kangaroo rats, measuring about 15 cm (6 in.) in length, not including its long, tufted tail.

They are tan or brown in color. They have a large head and large eyes, and long, strong hind legs with which it can hop at high speeds. Giant kangaroo rats have 5 toes.

Habitat: The giant kangaroo rat lives on dry, sandy grasslands and digs burrows in loose soil.

Only two percent of the original range remains. They can now only be found in isolated areas typically west of the San Joaquin Valley.

**Short-nosed Kangaroo Rat (*Dipodomys nitratoides brevinasus*)**



unknown photographer

Status: State Species of Special Concern

Identifying Characteristics:

The short-nosed kangaroo rat has a body length of 10-11 centimeters (4 in.), not including its long tufted tail.

The coat is buff-colored with a white belly, white hip stripe, and white stripe along each side of the tail. Short-nosed kangaroo rats only have 4 toes.

Habitat: Short-nosed kangaroo rats can be found on flat or gently rolling terrain in grassland and desert-shrub vegetation, and it digs burrows in loose soil.

### Swainson's Hawk (*Buteo swainsoni*)



Audubon



John C. Avise

Status: Federal Bird of Conservation Concern and State Threatened

Identifying Characteristics:

They are slimmer and slightly smaller than most other large hawks, such as red-tailed hawk, but have longer wings.

Most have light colored bellies with a dark reddish or dark brown chest. They have white wing linings with blackish flight feathers (see picture above).

Habitat: They tend to nest in tall trees that are in grasslands or near agriculture fields.

## Northern Harrier (*Circus cyaneus*)



Jan Sevcik

*Female*

*Male*

Status: State Species of Special Concern

Identifying Characteristics:

The northern harrier is slim, has long wings, and has a long tail with a noticeable white patch on the rump.

Up close they have an almost owl-like face. Adult males are typically grey and white with black wing tips, while females are larger and brown.

Habitat: Harriers nest on the ground. They are usually observed flying low over grassland, marshes, and agricultural fields.

**San Joaquin coachwhip (*Coluber flagellum ruddocki*)**



© Gary Nafis  
California Herps

Status: State Species of Special Concern

Identifying Characteristics:

San Joaquin coachwhips are 3-5 feet long with a large head and a thick neck.

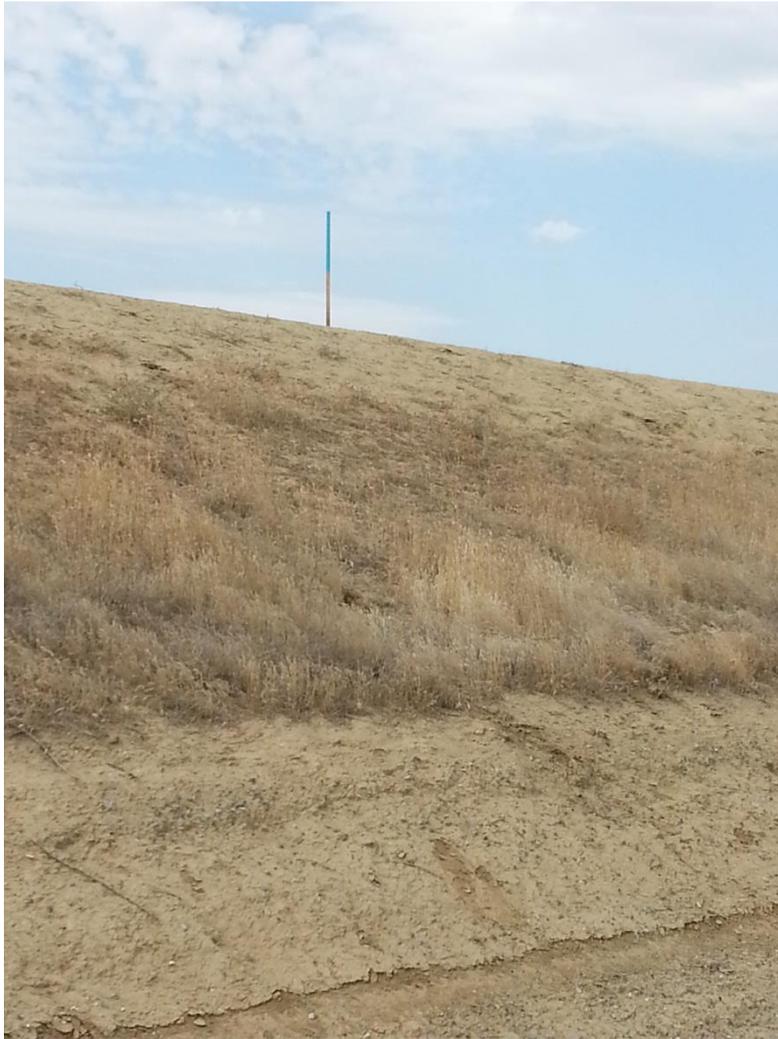
Coachwhips have a long, thin tail and large scales above the eyes. They can have coloration of tan, olive brown, or yellowish brown.

Habitat: Coachwhips can be found in open, dry, treeless areas.

They take refuge in rodent burrows in grassland or saltbush scrub. They can also be found under shaded vegetation or surface objects.



**A 150-foot radius buffer must be maintained around all stakes that are marked with yellow paint.**



**A 50-foot radius buffer must be maintained around all stakes marked with blue paint.**

## APPENDIX A

### Photographs of Habitat and BUOW Locations in the Project Area

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**Photographs of Project Activity Sites**

The Aqueduct embankments typically look similar; however, vegetation height may be sparser or denser depending on location. The following are photographs of typical embankment habitat in the Project area.



MP 137.30—Habitat facing downstream at an embankment that will be raised.



MP 139.27—Habitat facing downstream towards a turnout that will be modified.



MP 139.27—Habitat facing upstream of an embankment that will be raised.



MP 137.80—Habitat facing downstream west towards a pump pad modification site.



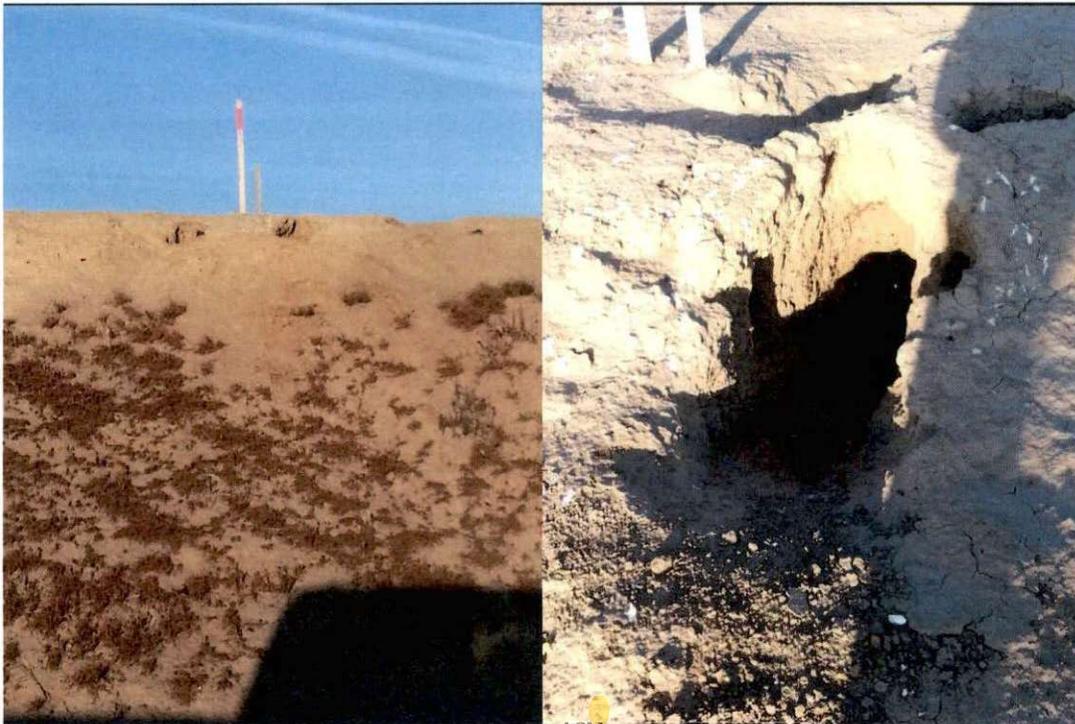
MP 133.61—Habitat facing downstream at the terminus of Cantua Creek where a borrow site will be located.

### Photographs of 2016 BUOW Locations

Not all burrow locations are depicted in the following photographs. These are photos of some of the observed burrows.



MP 134.18—A single BUOW was observed at this location only in March 2016. The burrow is located on the east side of the Aqueduct embankment. Photo A was taken facing west toward an agricultural field at a location close to the top of embankment, and shows whitewash and a pellet. Photo B is an example of the stakes at the top of the embankments that mark each burrow. Photo C shows the burrow entrance with whitewash, pellets, and a feather.



MP 134.25—A single BUOW was observed at this location only in March 2016. The burrow is located on the Aqueduct side of the embankment.



MP 134.35—A single BUOW was observed at this location only in March 2016. The burrow is located on the west side of the Aqueduct embankment.



MP 136.10—A single BUOW was observed at this location from April through May, 2016. A color difference was noticed during the individual observations of the single owls. On some occasions the adult was light colored and on other occasions a darker colored adult was seen, but a BUOW pair was observed at this location on June 1, 2016. This pair relocated its nestlings to MP 135.65 (see below). Photo A shows the lighter colored adult BUOW. The photo was taken facing in a westerly direction from a vehicle while passing the burrow. Photo B is the same burrow. The photo was taken facing upstream on the Aqueduct side of the embankment.



MP 135.65—A BUOW pair was observed at this location on July 7, 2016. The adult pair moved to this location from MP 136.10; three nestlings were present. The burrow is located on the Aqueduct side of the embankment. The photo was taken facing west.

Remaining document appendices available upon request.

**Post-Construction  
Western Burrowing Owl Report**

**for the**

**Cantua Creek Stream Group Improvements Project  
and Cantua Creek Sediment Removal Project**

**August 2019**



## **Project Description and Location**

The California Department of Water Resources' (DWR) Cantua Creek Stream Group Improvements Project (Project) began on September 16, 2016 and was completed on May 11, 2017. Project features included flood easement acquisition; raising portions of the California Aqueduct (Aqueduct) embankment; creating a channel to direct flood flows; raising pump pads, turnouts, and sections of asphalt and dirt roads; constructing a new weir; and removing sediment from Cantua Creek. Additional work, such as maintenance to an existing weir and an asphalt road repair along the Aqueduct, was later added to the Project scope.

The *Cantua Creek Stream Group Improvements Project Final Initial Study/Mitigated Negative Declaration* was filed with the State Clearinghouse (SCH) on December 12, 2014 (SCH Number 2014091063). A Lake and Streambed Alteration Agreement (SAA) was signed on September 8, 2015 (Notification No. 1600-2015-0069-R4).

In September 2016, prior to the start of construction, DWR submitted the *Western Burrowing Owl Survey Report for the Cantua Creek Stream Group Improvements Project/Cantua Creek Sediment Removal Project* (Pre-Project report) to the California Department of Fish and Wildlife (DFW). The Pre-Project report identified the locations of all known and potential burrowing owls (*Athene cunicularia*) (BUOW) and burrows in the Project area. The following report is the post-construction summary of the BUOW observations that occurred during, and at the completion of, construction.

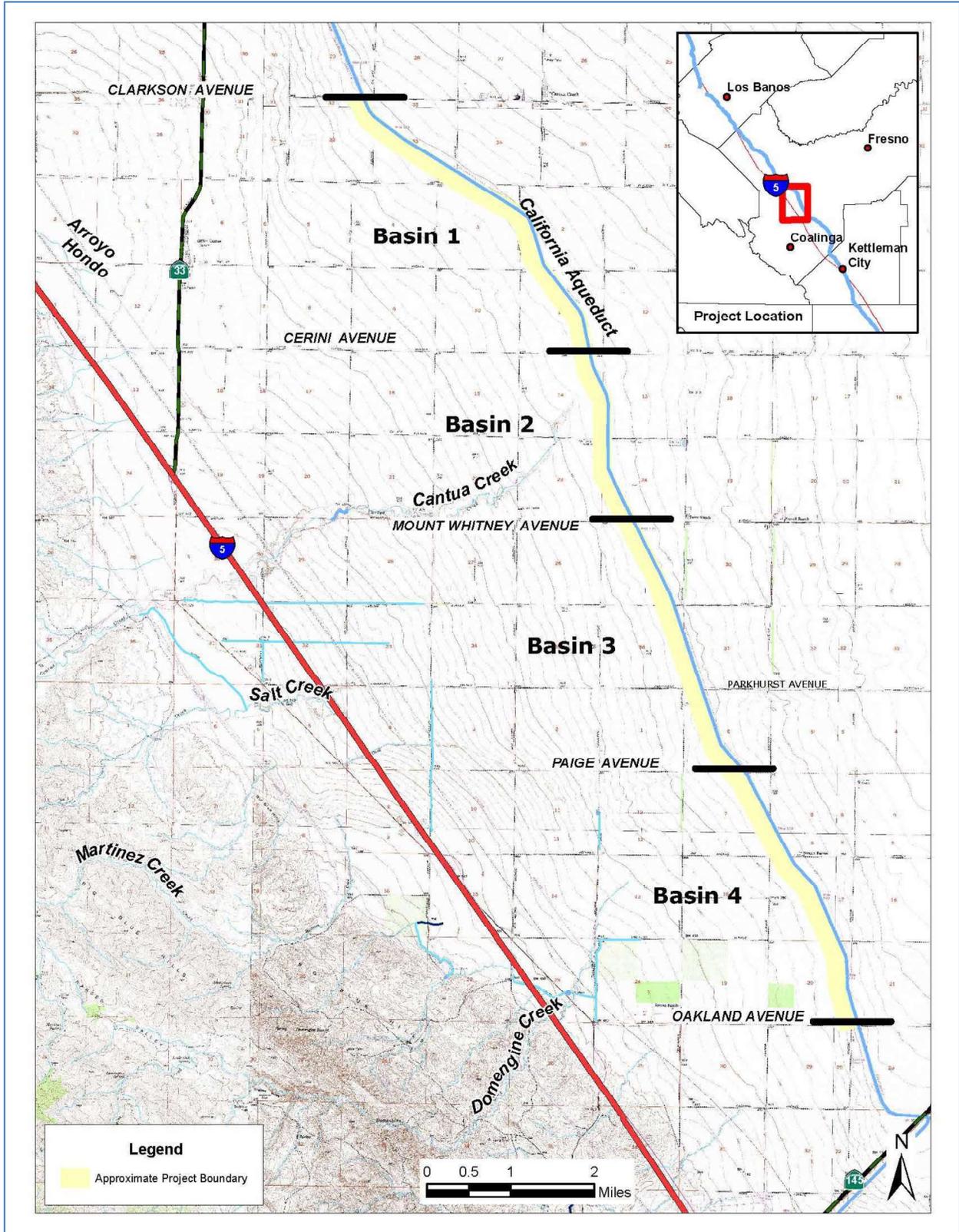
The Project was located on the west, or right (R), side of the Aqueduct along an approximate 13-mile stretch in western Fresno County between Clarkson Avenue and Oakland Avenue. The site was approximately 18 miles north of the City of Coalinga and 36 miles southwest of the City of Fresno (**Figure 1**). The Project consisted of 165 acres divided into four floodwater basins (**Figure 1**), between Aqueduct mileposts (MP) 128.48R and 141.60R. Most of the Project was in the DWR right-of-way (ROW), but work also occurred on DFW property and private property adjacent to the ROW.

## **Biological Setting**

### Habitat

Habitat in the Project area consisted of disturbed soils and was mostly ruderal with scattered non-native grasses, barren areas, or marginal quail bush scrub habitat. Vegetation was composed primarily of foxtail brome (*Bromus madritensis*), ripgut (*Bromus diandrus*), Russian thistle (*Salsola spp.*), fiddleneck (*Amsinckia sp.*), and heron's bill (*Erodium spp.*), with localized, dense thickets of quail bush (*Atriplex lentiformis*), and mulefat (*Baccharis salicifolia*). Thickets of cattails (*Typha spp.*) were in Basin 3 where adjacent landowners let farm ponds encroach on the DWR ROW.

Figure 1. Location of Project and Basins



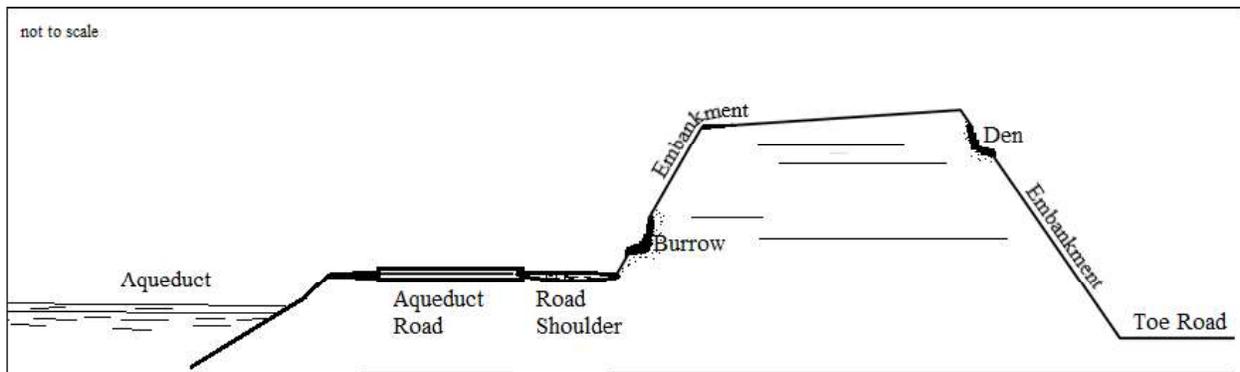
## Wildlife

Wildlife species observed during the Project are listed in **Table 1**. Evidence of pocket gophers (*Geomysidae*), kangaroo rats (*Dipodomys* sp.), and other small mammal species such as mice were also observed.

### Habitat Suitability for BUOW

Agricultural fields adjacent to the Project area provide cover and food for small mammals and a food source for BUOW. Numerous ground squirrel burrows and canid dens large enough for BUOW occupation exist on the Aqueduct embankment (**Figure 2**). Burrow and den elevation on the embankment varies.

**Figure 2.** Representative Cross Section of Aqueduct Roads, Embankment, and Location of Dens and Burrows



These burrows and dens were less abundant in the Project area north of Cantua Creek; only two burrows large enough for BUOW use were in this area. In the Project area south of Cantua Creek, at least 20 burrows large enough for BUOW were present. Conditions north and south of Cantua Creek are consistent with those described in the pre-Project report.

Agricultural vehicle traffic has been observed in the ROW on the right side of the Aqueduct since 2012 (when pre-Project site visits began), especially between Cantua Creek and Parkhurst Avenue, but BUOW continue to occupy the area.

**Table 1.** Species Observed During Construction

Scientific Name	Common Name	Federal	State
<i>Canis latrans</i>	coyote		
<i>Mus musculus</i>	house mouse		
<i>Peromyscus maniculatus</i>	deer mouse		
<i>Reithrodontomys megalotis</i>	western harvest mouse		
<i>Spermophilus beecheyi</i>	California ground squirrel		
<i>Sylvilagus audubonii</i>	desert cottontail		
<i>Agelaius phoeniceus</i>	red-winged blackbird		
<i>Athene cunicularia</i>	burrowing owl	BCC	SSC
<i>Bubo virginianus</i>	great horned owl		
<i>Buteo jamaicensis</i>	red-tailed hawk		
<i>Buteo swainsoni</i>	Swainson's hawk	BCC	T
<i>Cathartes aura</i>	turkey vulture		
<i>Charadrius vociferous</i>	killdeer		
<i>Circus cyaneus</i>	norther harrier		SSC
<i>Corvus sp.</i>	corvids		
<i>Falco sparverius</i>	American kestrel		
<i>Haemorhouse mexicanus</i>	house finch		
<i>Himantopus mexicanus</i>	black-necked stilt		
<i>Hirundo rustica</i>	barn swallow		
<i>Melospiza lincolni</i>	Lincoln's sparrow		
<i>Melospiza melodia</i>	song sparrow		
<i>Sayornis nigricans</i>	black phoebe		
<i>Passer domesticus</i>	house sparrow		
<i>Petrochelidon pyrrhonota</i>	cliff swallow		
<i>Tachycineta bicolor</i>	tree swallow		
<i>Tyto alba</i>	barn owl		
<i>Zonotrichia leucophrys</i>	white-crowned sparrow		
<i>Anaxyrus boreas</i>	western toad		
<i>Masticophis flagellum ruddocki</i>	San Joaquin coachwhip (part of carcass)		SSC
<i>Pituophis catenifer</i>	gopher snake		
<i>Uta stansburiana</i>	side-blotched lizard		

T = Threatened; BCC = Bird of Conservation Concern; SSC = Species of Special Concern

## Pre-construction Measures

Consistent with the pre-Project report, burrows were categorized using the following criteria:

- A burrow was considered a “burrow with sign” if fresh signs of BUOW activity were present at the burrow, but no BUOW had been observed during Project monitoring.
- A burrow was considered “occupied” if at any time during the monitoring period, a BUOW was observed at or near a burrow with sign.
- As defined in the 2012 DFW *Staff Report on Burrowing Owl Mitigation*, burrows were “presumed occupied” if a BUOW had been recorded at the burrow within the last three years, but no BUOW or fresh signs of BUOW use, such as whitewash, feathers, or pellets, were present at the burrow during Project monitoring.
- A burrow was considered a “potential burrow” if a BUOW, or signs of BUOW use, had never been recorded at the burrow, but the burrow was still considered large enough for a BUOW to occupy.

Only occupied burrows and burrows with sign were considered “active” burrows. Presumed occupied burrows and potential burrows were considered “inactive.”

On August 24, 2016, before mobilization, four-foot-long wooden stakes were used to mark areas where burrows were located. Stakes for burrows with sign, occupied burrows, and burrows that were presumed occupied were painted yellow; stakes associated with potential burrows were painted blue. All stakes were inserted at the top of the Aqueduct embankment where they could easily be seen from the Aqueduct road but were at least 1 foot away from the burrows. Stakes were placed where they would not interfere with BUOW flying to and from burrows. Each burrow location was recorded with a Trimble Juno Global Positioning System unit.

## Minimization Measures

The following minimization measures described in the pre-Project report were used as originally proposed, or were modified to fit Project needs:

- Preconstruction surveys were conducted on August 17–18, 2016 to determine if BUOW were present.
- Work typically took place during daylight hours, beginning after 0600 and ending by 1730 each day.
- Environmental training was given to all construction personnel before the start of their first work day. The training included identification of special-status species and their habitat, conditions to minimize impacts, and the phone numbers of Environmental Scientists in the event special-status species were seen or impacted (**Appendix A**).

- Vehicles and equipment remained on existing roads; the road shoulder was not used near BUOW burrows.
- The speed limit was restricted to 15 miles per hour (mph) where occupied burrows were present (MP 134.10R and MP 134.60R and between MP 135.63R and MP 136.13R), personnel were notified of the speed limit, and the area was monitored. In all other areas, the speed limit was restricted to 25 mph.
- In compliance with the SAA, a minimum 150-foot-radius buffer was maintained around all active burrows and all active burrows were monitored during construction by a DWR Environmental Scientist.
- If access was limited around active burrows, buffers were marked with stakes and the burrows were monitored while vehicles drove by. Instead of using hay bales or a shelter-in-place, a line of stakes with attached pink flagging was placed on the road shoulder. The flagged stakes were used because they had a smaller footprint and did not interfere with BUOW access to their burrows. The areas marked with a line of stakes were monitored when the DWR Inspector knew construction vehicles had to drive in the area. Photographs of the line of stakes and the construction occurring near them are in **Appendix B**.
- After January 31, 2017, buffers around all active burrows increased to 500 feet, in compliance with the SAA, and all active burrows were monitored by a DWR Environmental Scientist.
- When vehicles had to drive within 500 feet of the burrows, construction vehicles were escorted in and out of the area by an Environmental Scientist monitor driving another vehicle.
- The approximately 256-foot width of the Aqueduct continued to provide an adequate disturbance buffer for any burrows located on its east (or left) side.

### **Construction Monitoring Methods**

BUOW monitoring period began August 24, 2016, when a pre-construction site visit was made to check burrows before mobilization. Monitoring ended May 11, 2017, when the last piece of equipment was demobilized.

BUOW monitoring is defined as the surveillance of all active burrows, as well as the periodic check of potential burrows and those presumed occupied. Monitoring consisted of observing the burrow during all work occurring in an area, whereas periodic burrow checks consisted of only briefly checking a burrow by using binoculars or by walking to it to see if the BUOW, or BUOW signs, were still present.

The monitoring protocol consisted of the following:

- 1) Six Environmental Scientists were assigned to a monitoring schedule, assuring that a monitor would be available on all construction days. On days when multiple construction activities were expected to occur near active burrows, more than one monitor was assigned.
- 2) The DWR Inspector coordinated daily with the monitors to ensure that a monitor was present where needed. Before the end of every work day, the DWR Inspector was contacted by an Environmental Scientist to determine where work would occur the next day, where construction personnel were expected to access the work site, and the time work would start. The monitors scheduled to work the next day were then contacted and told about the next day's construction plans.
- 3) If construction was scheduled in an area with active burrows, a monitor arrived onsite to assess the area before work began. Monitors were required to park at least 150-feet away from active burrows during the non-breeding season and at least 500-feet away during the breeding season.
- 4) The date and time of observations, monitor's name, burrow location, presence or absence of a BUOW, and the behavior of any burrowing owls present were documented during monitoring and burrow checks. The datasheets and related field notes are available upon request.
- 5) The DWR Inspector was immediately told about potential impacts or violations.
- 6) From September 16, 2016 to January 31, 2017, where access was limited, active burrows were monitored when vehicles had to drive within 150 feet of them.
- 7) From February 1, 2017 to May 11, 2017, the buffer size around active burrows increased to 500 feet; work occurring within 500 feet of active burrows was monitored.
- 8) Periodic checks of both active and inactive burrows in other areas of the Project were performed in advance of scheduled work to determine whether burrow conditions had changed.
- 9) An Environmental Scientist attended weekly Project meetings to assess the status of the project, upcoming work locations, and any environmental concerns.

The number of times an active burrow was monitored depended on how long it took to complete work near it. The location of active burrows in relation to the Project features are shown in **Figure 3 through Figure 6**.

The monitoring period in each basin depended on when construction occurred there.

- In Basin 1, burrows were monitored between October 13, 2016 and May 5, 2017.
- In Basin 2, burrows were monitored between August 24, 2016 and April 24, 2017.
- In Basin 3, burrows were monitored between August 24, 2016 and May 11, 2017.
- In Basin 4, burrows were monitored between October 11, 2016 and April 28, 2017.

Monitoring was conducted at the following locations:

The burrows from MP 131.67R to MP 131.72R (Basin 1); MP 134.18R to MP 134.53R (Basin 2); and MP137.51R to MP 137.60R (Basin 3) were monitored while work was conducted on the pump pads.

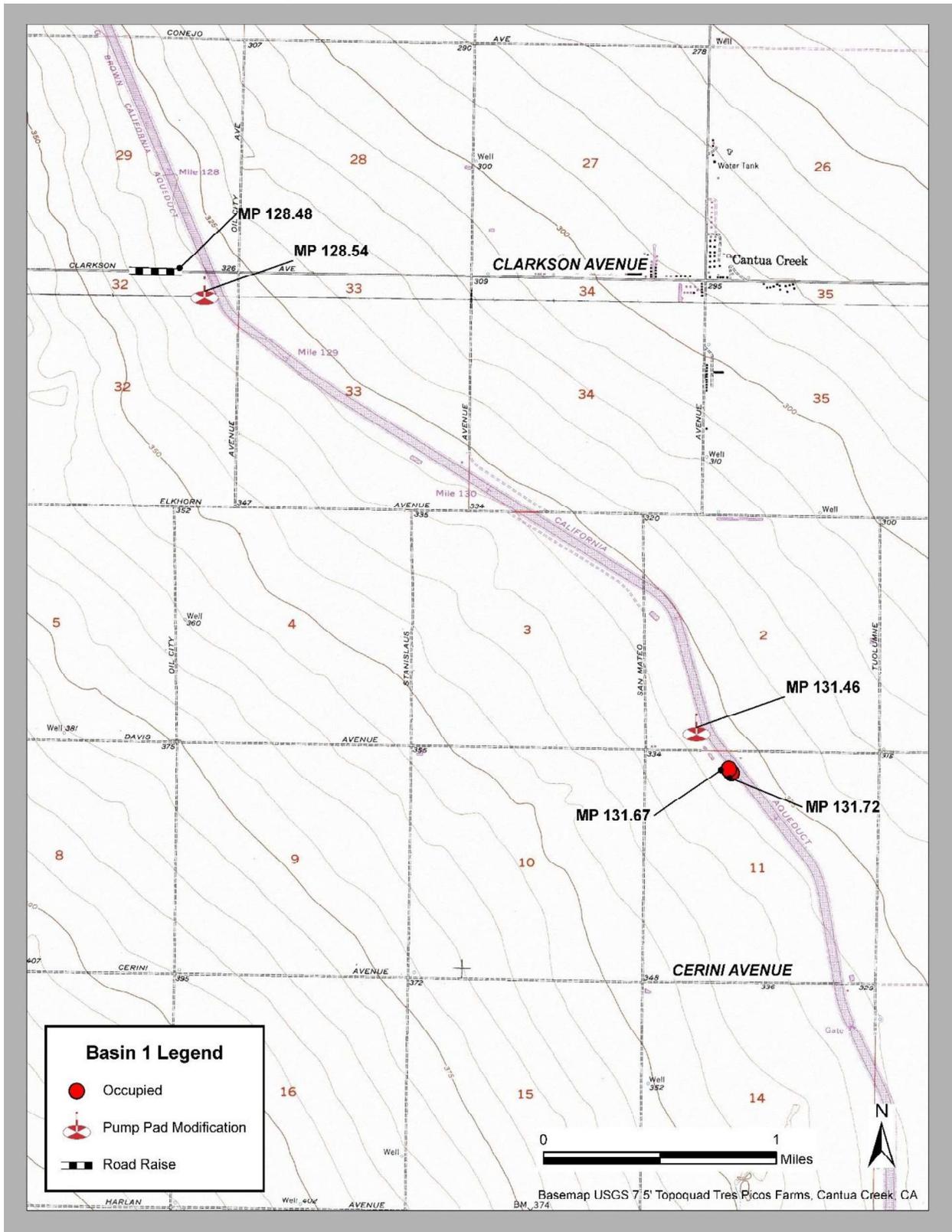
The burrows from MP 134.18R to MP 134.53R (Basin 2); MP 135.65R to MP 136.35R (Basin 3); and MP 141.01R to MP 141.02R (Basin 4) were monitored because construction traffic drove within 150 feet of them.

The burrows at MP 134.53R (Basin 2), MP 135.56R (Basin 3), and MP 140.05R (Basin 4) were monitored because embankments were raised near them.

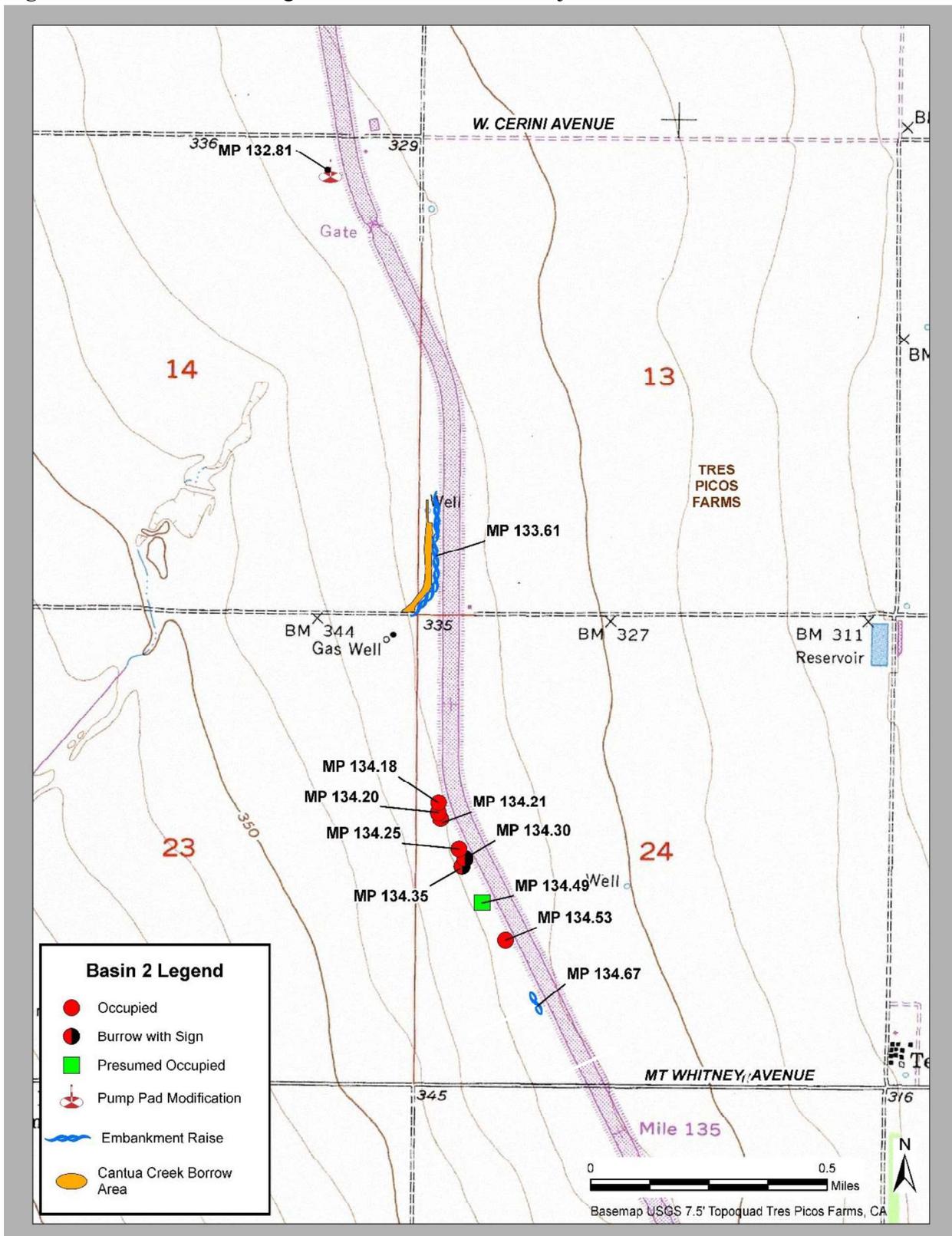
A burrow at MP 134.95R (Basin 3) was monitored while maintenance was conducted on an existing weir south of Mount Whitney Avenue.

The burrows in Basin 3 at MP 135.65R, MP 136.10R, and MP 136.35R were monitored because asphalt repairs were made on Parkhurst Avenue.

**Figure 3.** Basin 1 Burrowing Owl Observations and Project Features



**Figure 4.** Basin 2 Burrowing Owl Observations and Project Features



**Figure 5.** Basin 3 Burrowing Owl Observations and Project Features

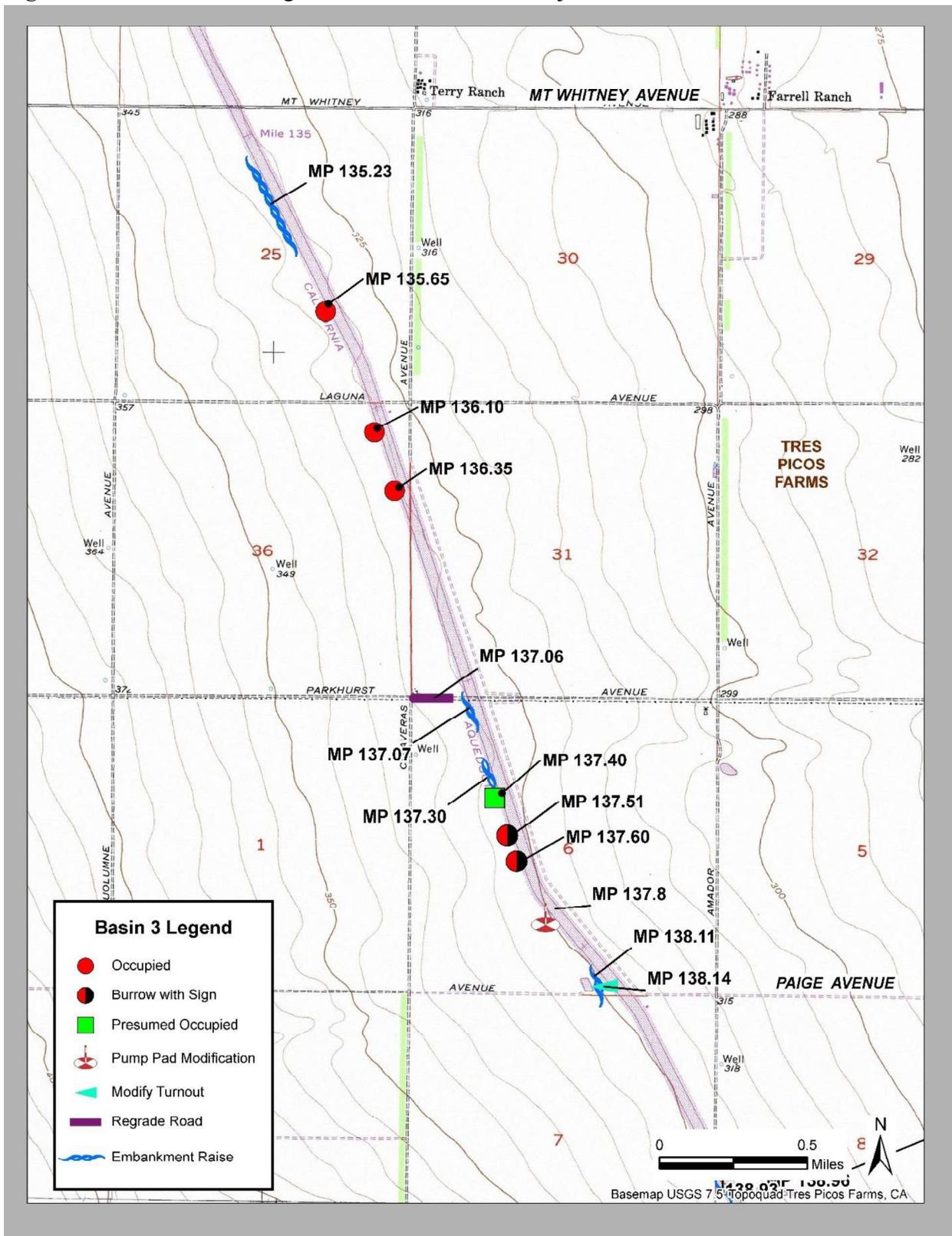
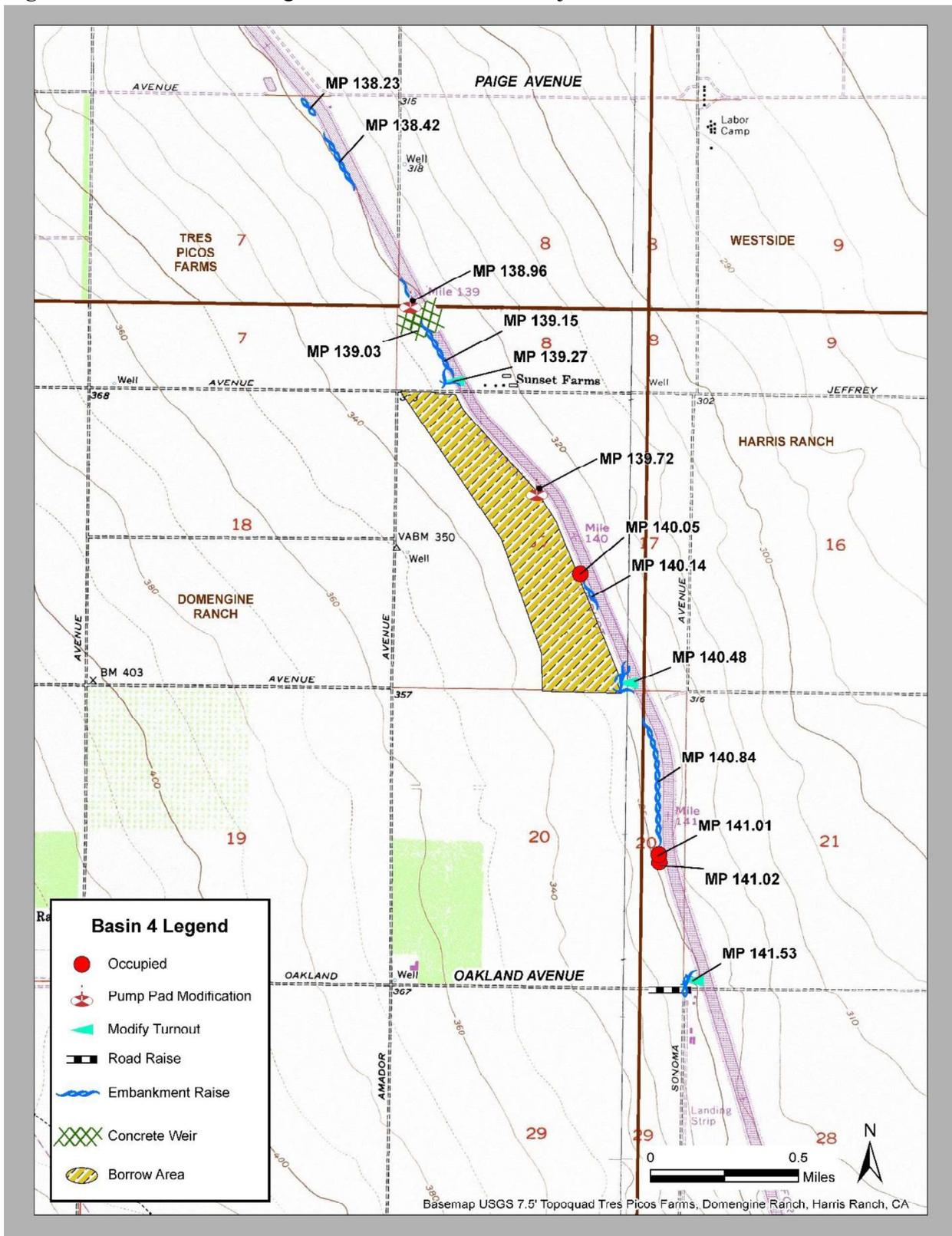


Figure 6. Basin 4 Burrowing Owl Observations and Project Features



Between January and May 2017, only intermittent construction occurred. Close coordination continued with the DWR Inspector to ensure monitors were onsite when needed.

## **Results and Discussion**

### Minimization Measures Evaluation

The following is an evaluation of some of the more protective minimization measures that were implemented.

Until January 31, 2017, a minimum 150-foot-radius buffer was maintained around all active burrows; after January 31, 2017, the buffer was increased to 500 feet. These buffers were strictly observed except where limited access required vehicles to drive closer to burrows.

Implementation of this measure effectively protected BUOW and burrows.

All active burrows were monitored during construction. No evidence of construction-related impacts to BUOW was observed. Implementation of this measure effectively protected BUOW and burrows.

Construction typically occurred 600 feet or more from the nearest burrow. At the borrow site, work occurred 500 feet from an active burrow during the breeding season, and one of the embankment raises was 150-feet away from an active burrow during the non-breeding season. No evidence of construction-related impacts to BUOW was observed.

Because of a communication line break, which required an emergency repair, work was conducted one night in an area that was approximately 0.4 miles away from the nearest active or inactive burrow. Work also occurred after dark to repair an existing weir; the nearest active or inactive burrow was about 0.4 miles away. An Environmental Scientist monitor was present at both work sites, and all access routes near burrows were avoided.

During construction, vehicles and equipment remained on existing roads, as required. The Aqueduct road shoulder was used only as necessary when construction vehicles had to pass each other. Use of the road shoulder was restricted near BUOW burrows. Implementation of this measure protected BUOW and burrows. There were no situations during construction where the avoidance of occupied burrows was considered infeasible.

The speed limit was restricted to 15 mph between MP 134.10R and MP 134.60R and between MP 135.63R and MP 136.37R. In all other areas, the speed limit was restricted to 25 mph. Implementation of this measure effectively prevented vehicle strikes to BUOW.

A DWR Environmental Scientist was immediately notified whenever an environmental concern arose so appropriate corrective action could be taken. The ability for the Environmental Scientist to assess the concern and implement a solution effectively prevented impacts to BUOW and burrows.

Twenty-four burrows were identified during the August 2016 pre-construction surveys. During construction, five burrows completely collapsed or filled with sediment due to rain. However, in Basin 4, two new occupied burrows were found during construction; one of these new burrows was a culvert under a toe road. Twenty-one burrows were identified post-construction.

During the pre-construction surveys conducted in August 2016, only two burrows were considered occupied. By the beginning of construction on September 16, 2016, the same two burrows were occupied; these were the only occupied burrows.

Pairs of BUOW were observed at MP 134.20R, MP 134.21R, MP 136.35R, and MP 136.10R during construction. A breeding pair was seen at MP 135.65R throughout construction; the other BUOW were all single birds.

The pair at MP 135.65R successfully bred three offspring, which were first seen July 7, 2016, prior to construction. One of these birds was confirmed to be a juvenile during the August 2016 pre-construction site visit. By the time construction began, it was difficult to distinguish the juveniles from the adults.

The number of occupied burrows varied throughout construction. Typically, one to three BUOW burrows would be recorded as occupied on any given day, but on occasion more were recorded as occupied. For instance, on October 13, 2016, six burrows were recorded as occupied by BUOW; on January 31, 2017, five burrows were recorded as occupied; and on March 20, 2017, four burrows were recorded as occupied.

Nine occupied burrows were recorded in October 2016. Although there was a reduction of occupied burrows in March, April, and May 2017, the remaining BUOW were predominantly in the areas of the heaviest construction traffic, including the breeding pair at MP 135.65R. This seems to indicate that construction activities did not cause the reduction in occupied burrows. As construction activities decreased and work became more concentrated in specific areas, less monitoring was required. Since burrows were considered occupied only if a monitor observed a BUOW at or near the burrow, the reduction in recorded occupancy may partially have been caused by the reduction in monitoring throughout the Project area. There was no evidence of vehicle strikes, injury, or any-construction-related impacts to BUOW during the Project.

Completed *CNDDDB Online Field Survey Form Reports* are in **Appendix C**.

## **APPENDIX B**

### **Post-construction Photographs**

MP 131.46R - Modified pump pad facing downstream next to agricultural land. Nearest occupied burrow location is downstream at MP 131.67R (January 14, 2017, Laura Castro).



MP 131.67R - BUOW observed at burrow entrance (November 10, 2017, Laura Castro).



MP 134.67R - Raised embankment facing upstream next to Aqueduct road. Nearest occupied burrow location is upstream at MP 134.53R (January 14, 2017, Laura Castro).



MP 134.53R - BUOW observed on top of embankment (January 17, 2017, Laura Castro).



MP 135.23R - Raised embankment facing downstream next to agricultural land. Nearest occupied burrow location is MP 135.65R (January 14, 2017, Laura Castro).



MP 135.65R - Facing downstream at Aqueduct road toward occupied burrow where a line of stakes was installed to prevent trucks from passing each other near burrow (October 6, 2016, Laura Castro).



MP 137.30R - Raised embankment facing downstream beside Aqueduct road. Nearest presumed occupied burrow location was downstream at MP 137.40R (January 14, 2017, Laura Castro).



MP 137.40R - Presumed occupied burrow (January 27, 2017, Laura Castro).



MP 137.80R - Modified pump pad facing upstream next to Aqueduct road. Nearest burrow with sign location was at MP 137.60R (January 14, 2017, Laura Castro).



MP 137.60R - Burrow with sign on agricultural side of embankment (January 17, 2017, Laura Castro).



MP 140.14R - Raised embankment facing downstream. Nearest occupied burrow location is MP 140.05R (January 14, 2017, Laura Castro).



MP 140.05R - Occupied burrow with whitewash on top of embankment (October 17, 2016, Laura Castro).



## **APPENDIX C**

### **CNDDDB Online Field Survey Form Reports**

## CNDDDB Online Field Survey Form Report



California Natural Diversity Database  
 Department of Fish and Wildlife  
 1416 9th Street, Suite 1266  
 Sacramento, CA 95814  
 Fax: 916.324.0475  
[cnddb@wildlife.ca.gov](mailto:cnddb@wildlife.ca.gov)  
[www.dfg.ca.gov/biogeodata/cnddb/](http://www.dfg.ca.gov/biogeodata/cnddb/)



Source code	xxxx
Quad code	3612043
Occ. no.	_____
EO index no.	_____
Map index no.	_____

This data has been reported to the CNDDDB, but may not have been evaluated by the CNDDDB staff

**Scientific name:** *Athene cucicularia*

**Common name:** burrowing owl

**Date of field work (mm-dd-yyyy):** 10-13-2016

**Comment about field work date(s):** 02/15/2017

**OBSERVER INFORMATION**

**Observer:** Laura Castro

**Affiliation:** DWR

**Address:** 3374 E. Shields Ave. , Fresno, CA 93726

**Email:** laura.castro@water.ca.gov

**Phone:** (559) 230-3350

**Other observers:** Shane Emerson, Hollund Rudolph, Kaitlin Bushell, Jennifer Bohling, Luis Avila, and Lida Shoeyb

**DETERMINATION**

**Keyed in:**

**Compared w/ specimen at:**

**Compared w/ image in:**

**By another person:**

**Other:** Identified by Dept. of Water Resources Environment Scientist

**Identification explanation:**

**Identification confidence:** Very confident

**Species found:** Yes If not found, why not?

**Level of survey effort:** Burrowing owl construction monitoring

**Total number of individuals:** 1

**Collection?** No

**Collection number:**

**Museum/Herbarium:**

**ANIMAL INFORMATION**

**How was the detection made?** Seen

**Number detected in each age class:**

1				
adults	juveniles	larvae	egg mass	unknown

**Age class comment:**

**Birds to use:**

- Nesting   
  Rookery   
  Nesting colony   
  Burrowsite   
  Lek  
 Nonbreeding (over-wintering)   
  Communal roost   
  Other

**Site use description:**

**What was the observed behavior?** Observed at burrow and flying in vicinity of burrow

**Describe any evidence of reproduction:**

**SITE INFORMATION**

**Habitat description:** Disturbed ruderal embankment next to CA Aqueduct road.

**Slope:**

Land owner/manager: Department of Water Resources

**Aspect:**

**Site condition + population viability:** Good

**Immediate & surrounding land use:** Orchard and CA Aqueduct

**Visible disturbances:** Agriculture, dirt road, Aqueduct road, and owl box

**Threats:** Predation, degradation of habitat, agriculture, vehicle strikes

**General comments:** Degradation of habitat - Maintenance and agricultural activity, including burning of agricultural materials, could impact or alter the stability of the burrow. Agricultural spraying could cause decline or contamination of food source.

**MAP INFORMATION**



ID	County	24K Quadrangle	Elev. (ft)	Latitude NAD83	Longitude NAD83	UTME NAD83	UTMN NAD83	UTM Zone
	Fresno	Tres Picos Farms	331	36.471025	-120.314	740661	4039538	10
1	Public Land Survey	Feature Comment						
	MTH7SR15Eel1							

The mapped feature is accurate within: 5 m

Submitted: 08/15/2018

XXXX

Page 2 of 3

**Source of mapped feature:** GPS

**Mapping notes:** Trimble Juno

**Location/directions comments:**

**Attachment(s):** 20161110\_MP 131.67 BUOW.jpg; 20161110\_MP 131.67 habitat.jpg; 20170214\_MP 131.67 burrow.jpg

Submitted: 08/15/2018

XXXX

Page 3 of 3

### CNDDDB Online Field Survey Form Report



California Natural Diversity Database  
Department of Fish and Wildlife  
1416 9th Street, Suite 1266  
Sacramento, CA 95814  
Fax: 916.324.0475  
[cnddb@wildlife.ca.gov](mailto:cnddb@wildlife.ca.gov)  
[www.dfg.ca.gov/bioqecodata/cnddb/](http://www.dfg.ca.gov/bioqecodata/cnddb/)



Source code	xxxx
Quad code	3612043
Occ. no.	
EO index no.	
Map index no.	

This data has been reported to the CNDDDB, but may not have been evaluated by the CNDDDB staff

Scientific name: *Athene cucularia*

Common name: burrowing owl

Date of field work (mm-dd-yyyy): 10-31-2016

Comment about field work date(s): 12/06/2016

**OBSERVER INFORMATION**

Observer: Laura Castro

Affiliation: DWR

Address: 3374 E. Shields Ave. , Fresno, CA 93726

Email: [laura.castro@water.ca.gov](mailto:laura.castro@water.ca.gov)

Phone: (559) 230-3350

Other observers: Shane Emerson, Hollund Rudolph, Kaitlin Bushell, Jennifer Bohling, Luis Avila, and Lida Shoeyb

**DETERMINATION**

Keyed in:

Compared w/ specimen at:

Compared w/ image in:

By another person:

Other: Identified by Dept. of Water Resources Environmental Scientist

Identification explanation:

Identification confidence: Very confident

Species found: Yes If not found, why not?

Level of survey effort: Burrowing owl construction monitoring

Total number of individuals: 1

Collection? No

Collection number:

Museum/Herbarium:

**ANIMAL INFORMATION**

How was the detection made? Seen

Number detected in each age class:

1				
adults	juveniles	larvae	egg mass	unknown

Age class comment:

**Bird site use:**

- Nesting   
  Rookery   
  Nesting colony   
  Burrowsite   
  Lek  
 Nontesting (over-wintering)   
  Communal roost   
  Other

**Site use description:**

**What was the observed behavior?** Perched at burrow entrance

**Describe any evidence of reproduction:**

**SITE INFORMATION**

**Habitat description:** Disturbed ruderal embankment next to CA Aqueduct road.

**Slope:**

Land owner/manager: Department of Water Resources

**Aspect:**

**Site condition + population viability:** Fair

**Immediate & surrounding land use:** Orchard and CA Aqueduct

**Visible disturbances:** Agriculture, dirt road, Aqueduct road, owl box

**Threats:** Predation, degradation of habitat, agriculture, vehicle strikes

**General comments:** Burrow is filling in with sediment. Degradation of habitat Maintenance and agricultural activity, including burning of agricultural materials, could impact or alter the stability of the burrow. Agricultural spraying could cause decline or contamination of food source.

**MAP INFORMATION**



ID	County	24K Quadrangle	Elev. (ft)	Latitude NAD83	Longitude NAD83	UTME NAD83	UTMN NAD83	UTM Zone
	Fresno	Tres Picos Farms	331	36.470689	-120.314	740662	4039511	10
1	Public Land Survey	Feature Comment						
	M T17S R1E 11							

The mapped feature is accurate within: 5 m

Submitted: 08/15/2018

XXXX

Page 2 of 3

**Source of mapped feature:** GPS

**Mapping notes:** Trimble Juno

**Location/directions comments:**

**Attachment(s):** 20161107\_MP 131.72 burrow.jpg 20161107\_MP 131.72 habitat.jpg 20161213\_MP 131.72 BU@W.jpg

Submitted: 08/15/2018

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Source code	xxxx
Quad code	3612043
Occ. no.	
EO index no.	
Map index no.	

This data has been reported to the CNDDDB, but may not have been evaluated by the CNDDDB staff

Scientific name: *Athene cucularia*

Common name: burrowing owl

Date of field work (mm-dd-yyyy): 12-13-2016

Comment about field work date(s): 2/16/2017

**OBSERVER INFORMATION**

Observer: Laura Castro

Affiliation: DWR

Address: 3374 E. Shields Ave. , Fresno, CA 93726

Email: [laura.castro@water.ca.gov](mailto:laura.castro@water.ca.gov)

Phone: (559) 223-3350

Other observers: Shane Emerson, Hollund Rudolph, Kaitlin Bushell, Jennifer Bohling, Luis Avila, and Lida Shoeyb

**DETERMINATION**

Keyed in:

Compared w/ specimen at:

Compared w/ image in:

By another person:

Other: Identified by Dept. of Water Resources Environmental Scientist

Identification explanation:

Identification confidence: Very confident

Species found: Yes If not found, why not?

Level of survey effort: Burrowing owl construction monitoring

Total number of individuals: 1

Collection? No

Collection number:

Museum/Herbarium:

**ANIMAL INFORMATION**

How was the detection made? Seen

Number detected in each age class:

1				
adults	juveniles	larvae	egg mass	unknown

Age class comment:

**Bird site use:**

- Nesting   
  Rookery   
  Nesting colony   
  Burrowsite   
  Lek  
 Nonbreeding (over-wintering)   
  Communal roost   
  Other

**Site use description:**

**What was the observed behavior?** Perched at burrow entrance

**Describe any evidence of reproduction:**

**SITE INFORMATION**

**Habitat description:** Disturbed non-native grassland on embankment next to CA Aqueduct road.

**Slope:**

Land owner/manager: Department of Water Resources

**Aspect:**

**Site condition + population viability:** Good

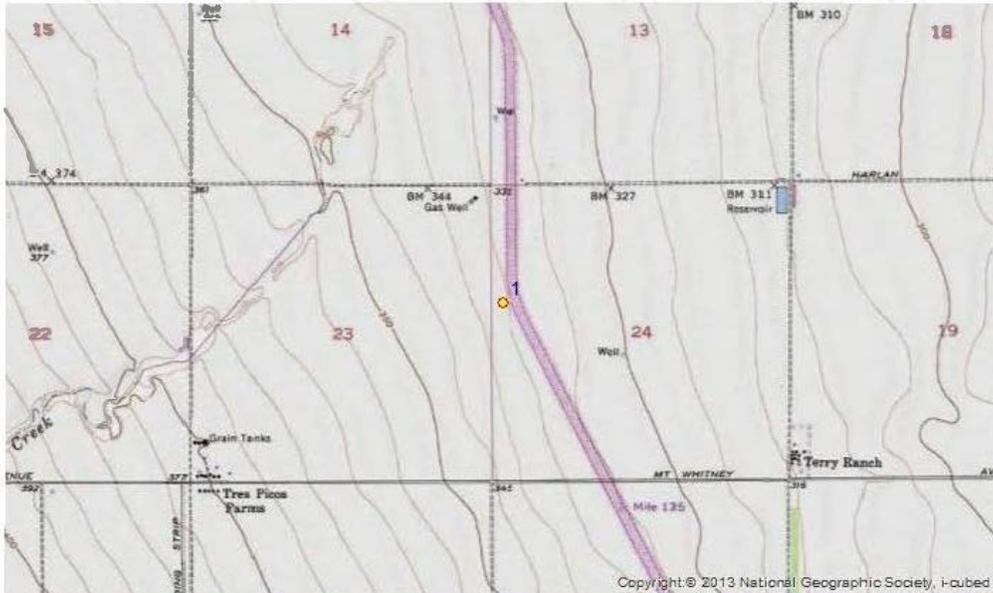
**Immediate & surrounding land use:** Agriculture and CA Aqueduct

**Visible disturbances:** Agriculture and dirt road

**Threats:** Predation, degradation of habitat, and agriculture.

**General comments:** Degradation of habitat - Equipment could impact or alter the stability of the burrow. Agricultural spraying could cause decline or contamination of food source.

**MAP INFORMATION**



ID	County	24K Quadrangle	Elev. (ft)	Latitude NAD83	Longitude NAD83	UTME NAD83	UTMN NAD83	UTM Zone
	Fresno	Tres Picos Farms	338	36.437252	-120.301439	741892	4035833	10
1	Public Land Survey	Feature Comment						
	M T17S R15E 24							

**The mapped feature is accurate within:** 5 m

**Source of mapped feature:** Trimble Juno

Submitted: 08/15/2018

XXXX

Page 2 of 3

**Mapping notes:**

**Location/directions comments:**

**Attachment(s):** 20161107\_MP 134.18 burrows.jpg, 20170147\_MP 134.18 habitat.JPG

Submitted: 08/15/2018

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[www.dfg.ca.gov/biogeodata/cnddb/](http://www.dfg.ca.gov/biogeodata/cnddb/)



Source code	xxxx
Quad code	3612043
Occ. no.	
EO index no.	
Map index no.	

This data has been reported to the CNDDDB, but may not have been evaluated by the CNDDDB staff

Scientific name: *Athene cucularia*

Common name: burrowing owl

Date of field work (mm-dd-yyyy): 11-07-2016

Comment about field work date(s): 11/11/2016

**OBSERVER INFORMATION**

Observer: Laura Castro

Affiliation: DWR

Address: 3374 E. Shields Ave. , Fresno, CA 93726

Email: [laura.castro@water.ca.gov](mailto:laura.castro@water.ca.gov)

Phone: (559) 230-3350

Other observers: Shane Emerson, Hollund Rudolph, Kaitlin Bushell, Jennifer Bohling, Luis Avila, and Lida Shoeyb

**DETERMINATION**

Keyed in:

Compared w/ specimen at:

Compared w/ image in:

By another person:

Other: Identified by Dept. of Water Resources Environmental Scientist

Identification explanation:

Identification confidence: Very confident

Species found: Yes If not found, why not?

Level of survey effort: Burrowing owl construction monitoring

Total number of individuals: 2

Collection? No

Collection number:

Museum/Herbarium:

**ANIMAL INFORMATION**

How was the detection made? Seen

Number detected in each age class:

2

adults

juveniles

larvae

egg mass

unknown

Age class comment:

**Bird site use:**

- Nesting   
  Rookery   
  Nesting colony   
  Burrowsite   
  Lek  
 Nonbreeding (over-wintering)   
  Communal roost   
  Other

**Site use description:**

**What was the observed behavior?** Hunkered down at burrow entrance

**Describe any evidence of reproduction:**

**SITE INFORMATION**

**Habitat description:** Disturbed ruderal embankment next to CA Aqueduct road.

**Slope:**

**Land owner/manager:** Department of Water Resources

**Aspect:**

**Site condition + population viability:** Fair

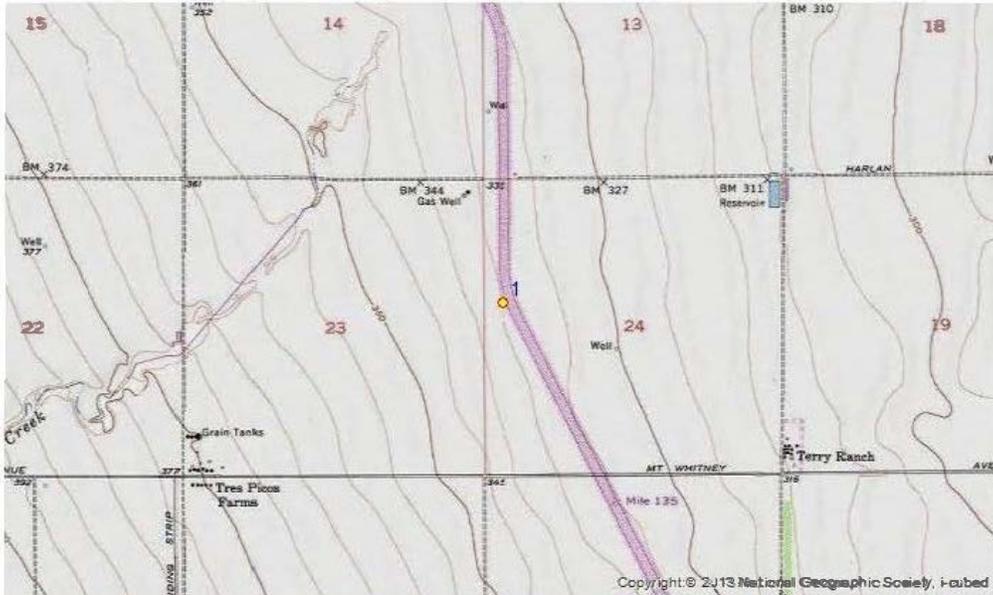
**Immediate & surrounding land use:** Agriculture and CA Aqueduct

**Visible disturbances:** Agriculture, dirt road, Aqueduct road

**Threats:** Predation, degradation of habitat, agriculture, vehicle strikes

**General comments:** Degradation of habitat - Maintenance and agricultural activity could impact or alter the stability of the burrow. Agricultural spraying could cause decline or contamination of food source.

**MAP INFORMATION**



ID	County	24K Quadrangle	Elev. (ft)	Latitude NAD83	Longitude NAD83	UTME NAD83	UTMN NAD83	UTM Zone
	Fresno	Tres Picos Farms	338	36.43696	-120.301	741932	4035801	10
1	Public Land Survey	Feature Comment						
		M T17S R15E 24						

**The mapped feature is accurate within: 5 m**

**Source of mapped feature:** GPS

Submitted: 00/15/2010

XXXX

Page 2 of 3

**Mapping notes:** Trimble June

**Location/directions comments:**

**Attachment(s):** 20161107\_MP 134.20 BU@Win habitat.jpg; 20170114\_MP 134.20 burrow.JPG

Submitted: 00/15/2010

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Source code	xxxx
Quad code	3612043
Occ. no.	
EO index no.	
Map index no.	

This data has been reported to the CNDDDB, but may not have been evaluated by the CNDDDB staff

Scientific name: *Athene cunicularia*

Common name: burrowing owl

Date of field work (mm-dd-yyyy): 10-13-2016

Comment about field work date(s):

**OBSERVER INFORMATION**

Observer: Laura Castro

Affiliation: DWR

Address: 3374 E. Shields Ave. , Fresno, CA 93726

Email: [laura.castro@water.ca.gov](mailto:laura.castro@water.ca.gov)

Phone: (559) 230-3350

Other observers: Shane Emerson, Hollund Rudolph, Kaitlin Bushell, Jennifer Bohling, Luis Avila, and Lida Shoeyb

**DETERMINATION**

Keyed in:

Compared w/ specimen at:

Compared w/ image in:

By another person:

Other: Identified by Dept. of Water Resources Environment Scientist

Identification explanation:

Identification confidence: Very confident

Species found: Yes If not found, why not?

Level of survey effort: Burrowing owl construction monitoring

Total number of individuals: 2

Collection? No

Collection number:

Museum/Herbarium:

**ANIMAL INFORMATION**

How was the detection made? Seen

Number detected in each age class:

2

adults

juveniles

larvae

egg mass

unknown

Age class comment:

**Bird site use:**

- Nesting   
  Rookery   
  Nesting colony   
  Burrowsite   
  Lek  
 Nonbreeding (over-wintering)   
  Communal roost   
  Other

**Site use description:**

**What was the observed behavior?** Flying from vicinity of burrow

**Describe any evidence of reproduction:**

**SITE INFORMATION**

**Habitat description:** Disturbed ruderal embankment next to CA Aqueduct road.

**Slope:**

Land owner/manager: Department of Water Resources

**Aspect:**

**Site condition + population viability:** Poor

**Immediate & surrounding land use:** Agriculture and CA Aqueduct

**Visible disturbances:** Agriculture and dirt road

**Threats:** Predation, degradation of habitat, agriculture, and vehicle strikes

**General comments:** Degradation of habitat - Maintenance and agricultural activity could impact or alter the stability of the burrow. Agricultural spraying could cause decline or contamination of food source.

**MAP INFORMATION**



ID	County	24K Quadrangle	Elev. (ft)	Latitude NAD83	Longitude NAD83	UTME NAD83	UTMN NAD83	UTM Zone
	Fresno	Tres Picos Farms	337	36.43772	-120.301	741930	4035886	10
1	Public Land Survey	Feature Comment						
	M T17S R15E 24							

The mapped feature is accurate within: 5 m

Source of mapped feature: GPS

Submitted: 08/15/2018

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Page 2 of 3

**Mapping notes:** Trimble Juno

**Location/directions comments:**

**Attachment(s):** 20161107\_MP 134.21 burrow.jpg

Submitted: 08/15/2018

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Source code	xxxx
Quad code	3612043
Occ. no.	
EO index no.	
Map index no.	

This data has been reported to the CNDDDB, but may not have been evaluated by the CNDDDB staff

Scientific name: *Athene cucularia*

Common name: burrowing owl

Date of field work (mm-dd-yyyy): 02-16-2017

Comment about field work date(s): 03/20/2017

**OBSERVER INFORMATION**

Observer: Laura Castro

Affiliation: DWR

Address: 3374 E. Shields Ave. , Fresno, CA 93726

Email: [laura.castro@water.ca.gov](mailto:laura.castro@water.ca.gov)

Phone: (559) 230-3350

Other observers: Shane Emerson, Hollund Rudolph, Kaitlin Bushell, Jennifer Bohling, Luis Avila, and Lida Shoeyb

**DETERMINATION**

Keyed in:

Compared w/ specimen at:

Compared w/ image in:

By another person:

Other: Identified by Dept. of Water Resources Environment Scientist

Identification explanation:

Identification confidence: Very confident

Species found: Yes If not found, why not?

Level of survey effort: Burrowing owl construction monitoring

Total number of individuals: 1

Collection? No

Collection number:

Museum/Herbarium:

**ANIMAL INFORMATION**

How was the detection made? Seen

Number detected in each age class:

1				
adults	juveniles	larvae	egg mass	unknown

Age class comment:

**Bird site use:**

- Nesting   
  Rookery   
  Nesting colony   
  Burrowsite   
  Lek  
 Nonbreeding (over-wintering)   
  Communal roost   
  Other

**Site use description:**

**What was the observed behavior?** Perched at burrow entrance

**Describe any evidence of reproduction:**

**SITE INFORMATION**

**Habitat description:** Disturbed non-native grassland on embankment next to CA Aqueduct road.

**Slope:**

Land owner/manager: Department of Water Resources

**Aspect:**

**Site condition + population viability:** Fair

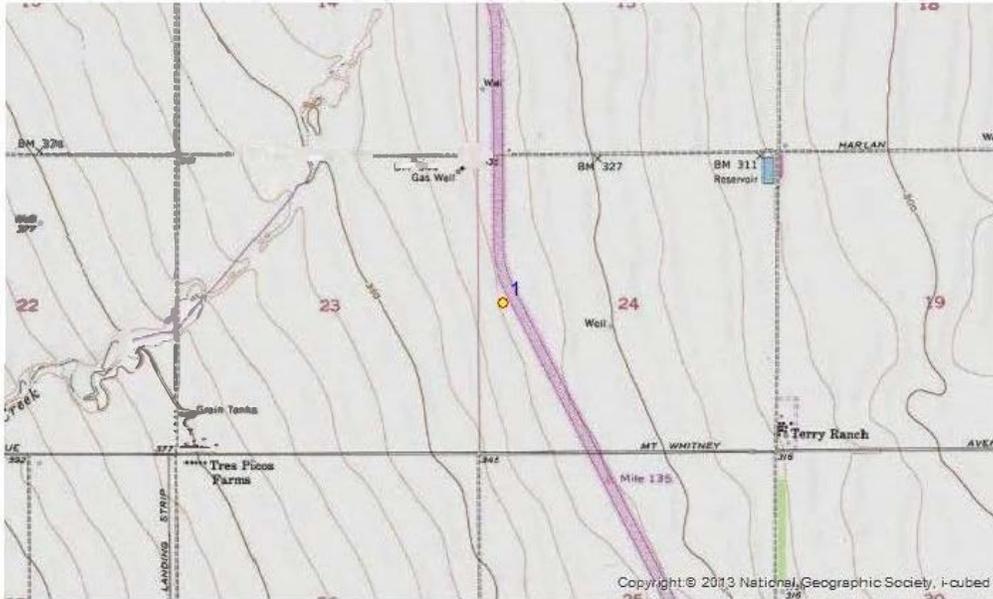
**Immediate & surrounding land use:** Agriculture and CA Aqueduct

**Visible disturbances:** Agriculture and dirt road

**Threats:** Predation, degradation of habitat, and agriculture

**General comments:** Degradation of habitat - Equipment could impact or alter the stability of the burrow. Agricultural spraying could cause decline or contamination of food source.

**MAP INFORMATION**



ID	County	24K Quadrangle	Elev. (ft)	Latitude NAD83	Longitude NAD83	UTME NAD83	UTMN NAD83	UTM Zone
	Fresno	Tres Picos Farms	337	36.435268	-120.300649	741967	4035681	10
1	Public Land Survey	Feature Comment						
		MT 17S RISE 24						

The mapped feature is accurate within: 5 m

Source of mapped feature: GPS

Submitted: 08/15/2018

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Page 2 of 3

Mapping notes: Trimble Juno

Location/directions comments:

Attachment(s): 20161107\_MP 134.25 burrow.jpg

Submitted: 08/15/2018

XXXX

Page 3 of 3

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Source code	xxxx
Quad code	3612043
Occ. no.	
EO index no.	
Map index no.	

This data has been reported to the CNDDDB, but may not have been evaluated by the CNDDDB staff

Scientific name: *Athene cucularia*

Common name: burrowing owl

Date of field work (mm-dd-yyyy): 10-11-2016

Comment about field work date(s): 02/16/2017

**OBSERVER INFORMATION**

Observer: Laura Castro

Affiliation: DWR

Address: 3374 E. Shields Ave. , Fresno, CA 93726

Email: [laura.castro@water.ca.gov](mailto:laura.castro@water.ca.gov)

Phone: (559) 230-3350

Other observers: Shane Emerson, Hollund Rudolph, Kaitlin Bushell, Jennifer Bohling, Luis Avila, and Lida Shoeyb

**DETERMINATION**

Keyed in:

Compared w/ specimen at:

Compared w/ image in:

By another person:

Other: Identified by Dept. of Water Resources Environmental Scientist

Identification explanation:

Identification confidence: Very confident

Species found: Yes If not found, why not?

Level of survey effort: Burrowing owl construction monitoring

Total number of individuals: 1

Collection? No

Collection number:

Museum/Herbarium:

**ANIMAL INFORMATION**

How was the detection made? Seen

Number detected in each age class:

1				
adults	juveniles	larvae	egg mass	unknown

Age class comment:



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Source code	xxxx
Quad code	3612043
Occ. no.	
EO index no.	
Map index no.	

This data has been reported to the CNDDDB, but may not have been evaluated by the CNDDDB staff

Scientific name: *Athene cucularia*

Common name: burrowing owl

Date of field work (mm-dd-yyyy): 08-18-2016

Comment about field work date(s): 04/26/2017

**OBSERVER INFORMATION**

Observer: Laura Castro

Affiliation: DWR

Address: 3374 E. Shields Ave. , Fresno, CA 93726

Email: [laura.castro@water.ca.gov](mailto:laura.castro@water.ca.gov)

Phone: (559) 230-3350

Other observers: Shane Emerson, Hollund Rudolph, Kaitlin Bushell, Jennifer Bohling, Luis Avila, and Lida Shoeyb

**DETERMINATION**

Keyed in:

Compared w/ specimen at:

Compared w/ image in:

By another person:

Other: Identified by Dept. of Water Resources Environmental Scientist

Identification explanation:

Identification confidence: Very confident

Species found: Yes If not found, why not?

Level of survey effort: Burrowing owl construction monitoring

Total number of individuals: 4

Collection? No

Collection number:

Museum/Herbarium:

**ANIMAL INFORMATION**

How was the detection made? Seen

Number detected in each age class:

2	2			
adults	juveniles	larvae	egg mass	unknown

Age class comment:



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Source code	xxxx
Quad code	3612043
Occ. no.	
EO index no.	
Map index no.	

This data has been reported to the CNDDDB, but may not have been evaluated by the CNDDDB staff

**Scientific name:** *Athene cucularia*

**Common name:** burrowing owl

**Date of field work (mm-dd-yyyy):** 08-17-2016

**Comment about field work date(s):** 05/05/2017

**OBSERVER INFORMATION**

**Observer:** Laura Castro

**Affiliation:** DWR

**Address:** 3374 E. Shields Ave. , Fresno, CA 93726

**Email:** laura.castro@water.ca.gov

**Phone:** (559) 230-3350

**Other observers:** Shane Emerson, Hollund Rudolph, Kaitlin Bushell, Jennifer Bohling, Luis Avila, and Lida Shoeyb

**DETERMINATION**

**Keyed in:**

**Compared w/ specimen at:**

**Compared w/ image in:**

**By another person:**

**Other:** Identified by Dept. of Water Resources Environmental Scientist

**Identification explanation:**

**Identification confidence:** Very confident

**Species found:** Yes If not found, why not?

**Level of survey effort:** Burrowing owl construction monitoring

**Total number of individuals:** 2

**Collection?** No

**Collection number:**

**Museum/Herbarium:**

**ANIMAL INFORMATION**

**How was the detection made?** Seen

**Number detected in each age class:**

1	1			
adults	juveniles	larvae	egg mass	unknown

**Age class comment:**

**Birds to use:**

- Nesting   
  Rookery   
  Nesting colony   
  Burrowsite   
  Lek  
 Nonbreasting (over-wintering)   
  Communal roost   
  Other

**Site use description:**

**What was the observed behavior?** Perched at burrow entrance

**Describe any evidence of reproduction:**

**SITE INFORMATION**

**Habitat description:** Disturbed non-native grassland on embankment next to CA Aqueduct road.

**Slope:** Land owner/manager: Department of Water Resources

**Aspect:**

**Site condition + population viability:** Excellent

**Immediate & surrounding land use:** Agriculture and CA Aqueduct

**Visible disturbances:** Agriculture and dirt road

**Threats:** Predation, degradation of habitat, and agriculture

**General comments:** Degradation of habitat- Equipment could impact or alter the stability of the burrow. Agricultural spraying could cause decline or contamination of food source.

**MAP INFORMATION**



ID	County	24K Quadrangle	Elev. (ft)	Latitude NAD83	Longitude NAD83	UTME NAD83	UTMN NAD83	UTM Zone
	Fresno	Tres Picos Farms	334	36.412759	-120.286513	743306	4033152	10
1	Public Land Survey	Feature Comment						
	M T17S R15E 36							

The mapped feature is accurate within: 5 m

Source of mapped feature: GPS

Submitted: 08/15/2018

xxxx

Page 2 of 3

Mapping notes: Triable Juco

Location/directions comments:

Attachment(s): 20161006\_MP 136.10 BUOW\_.jpg, 20170320\_MP 136.10 BUOW\_.jpg

Submitted: 08/15/2018

xxxx

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Source code	xxxx
Quad code	3612043
Occ. no.	
EO index no.	
Map index no.	

This data has been reported to the CNDDDB, but may not have been evaluated by the CNDDDB staff

Scientific name: *Athene cucularia*

Common name: burrowing owl

Date of field work (mm-dd-yyyy): 10-06-2016

Comment about field work date(s): 04/28/2017

**OBSERVER INFORMATION**

Observer: Laura Castro

Affiliation: DWR

Address: 3374 E. Shields Ave. , Fresno, CA 93726

Email: laura.castro@water.ca.gov

Phone: (559) 230-3350

Other observers: Shane Emerson, Hollund Rudolph, Kaitlin Bushell, Jennifer Bohling, Luis Avila, and Lida Shoeyb

**DETERMINATION**

Keyed in:

Compared w/ specimen at:

Compared w/ image in:

By another person:

Other: Identified by Dept. of Water Resources Environmental Scientist

Identification explanation:

Identification confidence: Very confident

Species found: Yes If not found, why not?

Level of survey effort: Burrowing owl construction monitoring

Total number of individuals: 1

Collection? No

Collection number:

Museum/Herbarium:

**ANIMAL INFORMATION**

How was the detection made? Seen

Number detected in each age class:

1				
adults	juveniles	larvae	egg mass	unknown

Age class comment:

**Bird site use:**

- Nesting   
  Rookery   
  Nesting colony   
  Burrowsite   
  Lek  
 Nonbreeding (over-wintering)   
  Communal roost   
  Other

**Site use description:**

**What was the observed behavior?** Perched at burrow entrance.

**Describe any evidence of reproduction:**

**SITE INFORMATION**

**Habitat description:** Disturbed non-native grassland on embankment next to CA Aqueduct road.

**Slope:**

Land owner/manager: Department of Water Resources

**Aspect:**

**Site condition + population viability:** Good

**Immediate & surrounding land use:** Agriculture and CA Aqueduct

**Visible disturbances:** Agriculture and dirt road

**Threats:** Predation, degradation of habitat, and agriculture

**General comments:** Degradation of habitat - Equipment could impact or alter the stability of the burrow. Agricultural spraying could cause decline or contamination of food source.

**MAP INFORMATION**



ID	County	24K Quadrangle	Elev. (ft)	Latitude NAD83	Longitude NAD83	UTME NAD83	UTMN NAD83	UTM Zone
	Fresno	Tres Picos Farms	334	36.409939	-120.285251	743428	4032843	10
1	Public Land Survey	Feature Comment						
	M T17S R15E 36							

The mapped feature is accurate within: 5 m

Source of mapped feature: GPS

Submitted: 08/15/2018

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Page 2 of 3

Mapping notes: Trimble Juno

Location/directions comments:

Attachment(s): 20170320\_MP 136.35 burrow.jpg

Submitted: 08/16/2018

XXXX

Page 3 of 3



Bird site use:

- Nesting   
 Rookery   
 Nesting colony   
 Burrowsite   
 Lek  
 Nonbreeding (over-wintering)   
 Communal roost   
 Other

Site use description:

What was the observed behavior? **BUOW** perched above burrow. **BUOW** was observed again November 7, 2016 perched on upper lip outside burrow entrance.

Describe any evidence of reproduction:

**SITE INFORMATION**

Habitat description: Disturbed ruderal embankment next to CA Aqueduct road.

Slope: 3%

Land owner/manager: Dept. of Water Resources

Aspect: west side of embank

Site condition + population viability: **Poor**

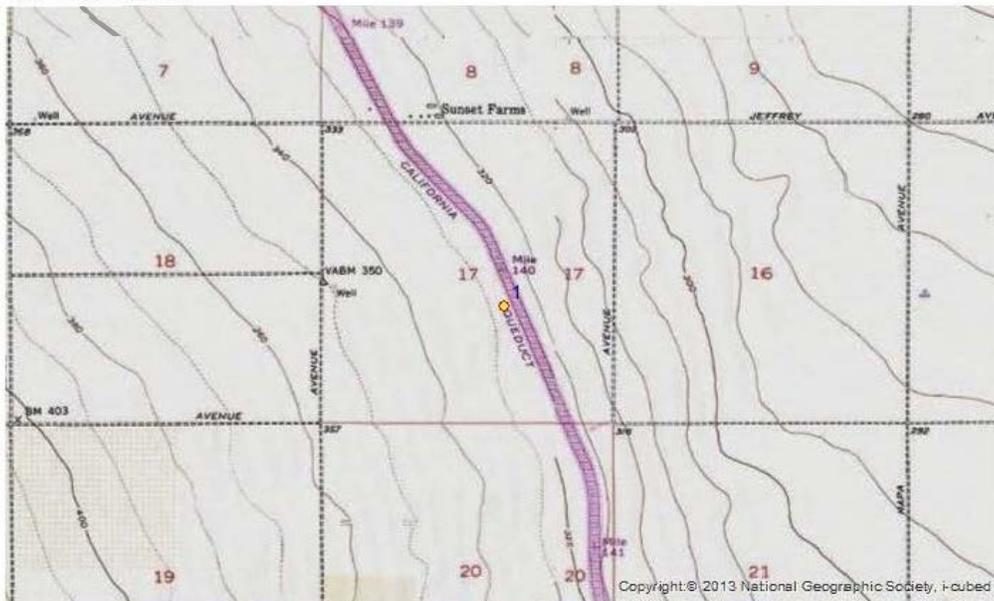
Immediate & surrounding land use: orchard, fallow field, and CA Aqueduct

Visible disturbances: Agriculture and embankment road

Threats: predation, degradation of habitat, agriculture, vehicle strikes

General comments: Degradation of habitat - Maintenance and agricultural activity could impact or alter the stability of the burrow. Agricultural spraying could cause decline or contamination of food source.

**MAP INFORMATION**



ID	County	24K Quadrangle	Elev. (ft)	Latitude NAD83	Longitude NAD83	UTME NAD83	UTMN NAD83	UTM Zone
	Fresno	Demengine Ranch	330	36.36197	-120.25400	746383	4027600	10
1	Public Land Survey	Feature Comment						
		M TISS RICE 17						

The mapped feature is accurate within: 5 m

Submitted: 08/15/2018

CAS16F0023

Page 2 of 3

Source of mapped feature: GPS

Mapping notes: CA Aqueduct MP 141.05

Location/directions comments:

Attachment(s): 20161017\_MP 140.05 burrow.jpg; 20161017\_MP 140.05 habitat.jpg

Submitted: 08/15/2018

CAS16F0023

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**Bird site use:**

- Nesting   
  Rookery   
  Nesting colony   
  Burrowsite   
  Lek  
 Nonbreeding (over-wintering)   
  Communal roost   
  Other

**Site use description:** It is suspected that BUOW at this location is also using burrow at MP 141.02, based on the close proximity of the burrows.

**What was the observed behavior?** Adult flew out of culvert to edge of agricultural field.

**Describe any evidence of reproduction:**

**SITE INFORMATION**

**Habitat description:** Disturbed ruderal embankment next to CA Aqueduct road.

**Slope:** 2%

**Land owner/manager:** CA Dept. of Water Resources

**Aspect:**

**Site condition + population viability:** Poor

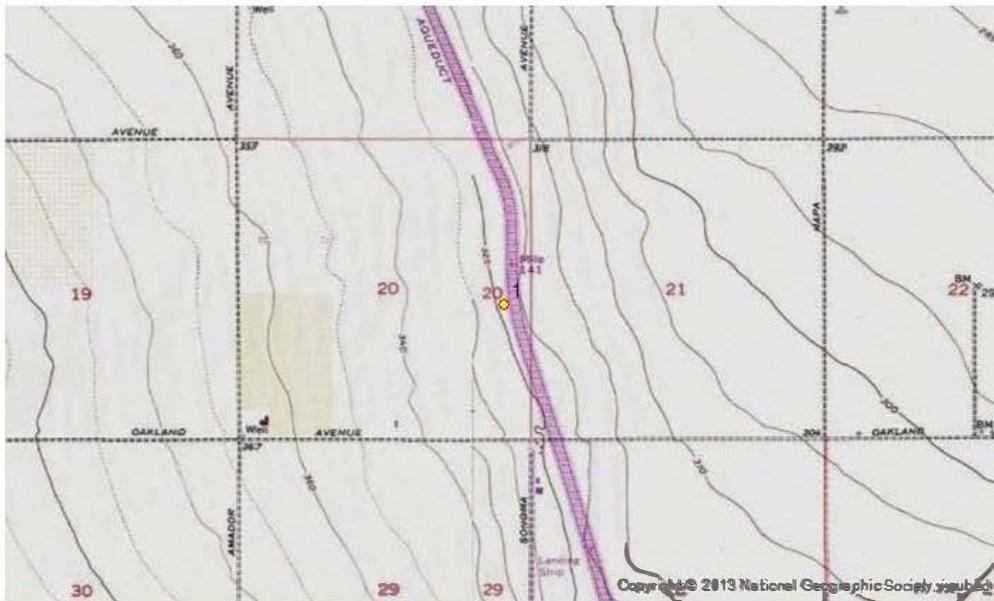
**Immediate & surrounding land use:** Agriculture and CA Aqueduct

**Visible disturbances:** Agriculture and the road

**Threats:** Predation, degradation of habitat, agriculture, vehicle strikes

**General comments:** Degradation of habitat - Maintenance and agricultural activity could impact or alter the stability of the burrow. Agricultural spraying could cause decline or contamination of food source.

**MAP INFORMATION**



ID	County	24K Quadrangle	Elev. (ft)	Latitude NAD83	Longitude NAD83	UTME NAD83	UTMN NAD83	UTM Zone
	Fresno	Harris Ranch	327	36°24'27"	-120°24'00"	746875	4026092	10
1	Public Land Survey	Feature Comment						
	M TIES RICE 20	MP 141.01 of the CA Aqueduct						

The mapped feature is accurate within: 5 m

Submitted: 08/15/2018

CAS17F0006

Page 2 of 3

**Source of mapped feature:** GIS

**Mapping notes:** MP 141.02 of CA Aqueduct. BUOW in culvert under dirt toe road.

**Location/directions comments:**

**Attachment(s):** 20170309\_MP 141.01 habitat.jpg

Submitted: 08/15/2018

CAS17F0006

Page 3 of 3



**Bird site use:**

- Nesting   
  Rookery   
  Nesting colony   
  Burrowsite   
  Lek  
 Nonbreeding (over-wintering)   
  Communal roost   
  Other

**Site use description:** Three burrows side by side at this location.

**What was the observed behavior?** flew out of burrow and then back in.

**Describe any evidence of reproduction:**

**SITE INFORMATION**

**Habitat description:** Disturbed non-native grassland on embankment next to CA Aqueduct road.

**Slope:** 25 degrees

**Land owner/manager:** Department of Water Resources

**Aspect:** west

**Site condition + population viability:** Fair

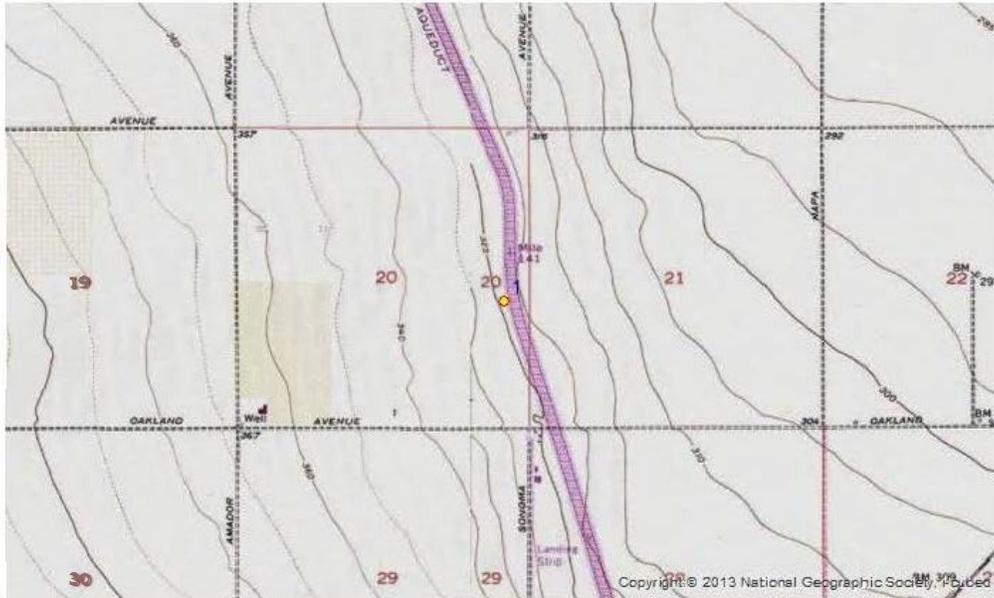
**Immediate & surrounding land use:** Agriculture and CA Aqueduct

**Visible disturbances:** Agriculture and embankment road

**Threats:** Predation, degradation of habitat, agriculture, vehicle strikes

**General comments:** Degradation of habitat - Maintenance and agricultural activity could impact or alter the stability of the burrow. Agricultural spraying could cause decline or contamination of food source.

**MAP INFORMATION**



ID	County	24K Quadrangle	Elev. (ft)	Latitude NAD83	Longitude NAD83	UTME NAD83	UTMN NAD83	UTM Zone
	Fresno	Harris Ranch	327	36.4787	-120.24890	746885	4026049	10
1	Public Land Survey	Feature Comment						
	M T18S R16E 20	MP 141.02 on right side of CA Aqueduct						

**The mapped feature is accurate within:** 5 m

**Source of mapped feature:** GPS

Submitted: 08/17/2018

CAS17F0007

Page 2 of 3

**Mapping notes:** MP 141.02 on right side of CA Aqueduct

**Location/directions comments:**

**Attachment(s):** 20170216\_MP 141.02 burrow and habitat.jpg; 20170216\_MP 141.02 burrow.jpg

Submitted: 08/17/2018

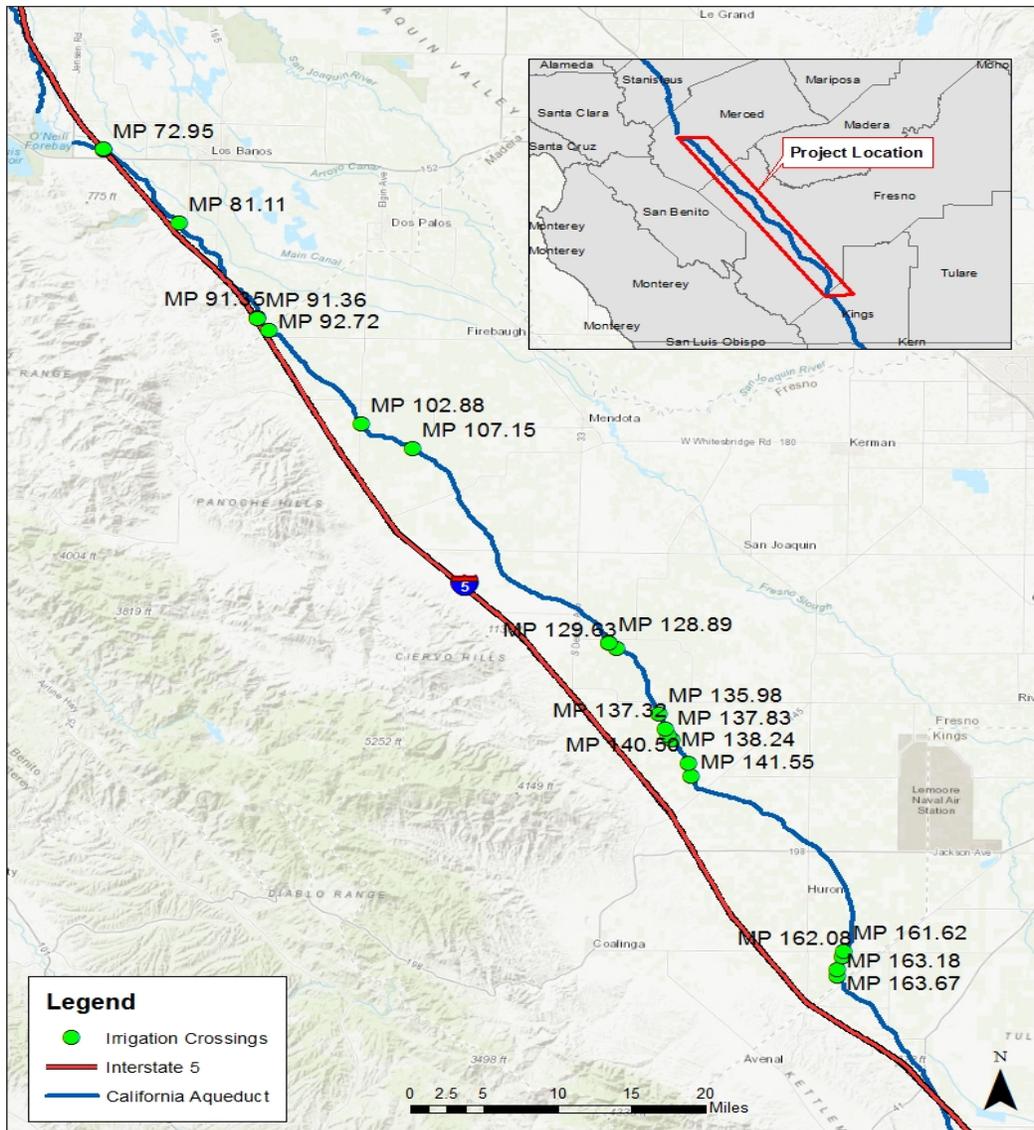
CAS17F0007

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## Project Location

The Irrigation Crossing Pipe Inspections and Repair Project (Project) is located along the California Aqueduct (Aqueduct) in Merced County and Fresno County. The Project includes 19 irrigation pipe crossings (Irrigation Crossings) at milepost (MP) 72.95, MP 81.11, MP 91.35, MP 91.36, MP 92.72, MP 102.88, MP 107.15, MP 129.63, MP 128.89, MP 135.98, MP 137.32, MP 137.83, MP 138.24, MP 140.50, MP 141.55, MP 162.08, MP 161.62, MP 163.18, and MP 163.67. The most northern Irrigation Crossing, MP 72.95, is adjacent to Interstate Highway 5, which is approximately 2.3 miles east of the O'Neill Forebay in Merced County, and the most southern Irrigation Crossing, MP 163.67, is approximately 6 miles southeast of the City of Huron in Fresno County (Figure 1).

**Figure 1.** Location Map of the 19 Irrigation Crossings on the Aqueduct.



## **Project Description**

Diversified Project Services International (DPSI), a private contractor, will be conducting ground penetrating radar surveys to locate the Irrigation Crossings that are associated with the Aqueduct. This will allow cleaning and Remote Video Inspection (RVI) to be conducted. The Project is organized into three groups, A, B, and C, based on their conditions, but cleaning and inspections will be performed at all pipes. The Project footprint will be a 300 feet area on both sides of the Aqueduct at each pipe crossing site. The date of mobilization is November 4, 2019, and the first step will be exposing the Crossings and determining their condition. The staging area and work area for this first step will be within the 300 feet footprint surrounding each Irrigation Crossing. Work also includes a pipeline abandonment option if an emergency arises.

### Group A

Two Irrigation Crossing pipes located at MP 163.18 and MP 137.32 have been identified as having open ends. The Irrigation Crossing pipes will be depressurized and any standing water inside the pipes or near the pipe ends will be placed in a Baker tank. Next, the pipes will be cleaned by hydroblasting; any water from this process will also be placed in the Baker tank. All water found in the pipes will be tested and later disposed of appropriately. RVI will commence after water has been removed.

### Group B

A set of 11 Irrigation Crossings, located at MP 163.67, MP 162.08, MP 141.55, MP 140.50, MP 138.24, MP 135.98, MP 129.63, MP 128.89, MP 92.72, MP 81.11, and MP 72.95 are not in service but has closed ends. These pipes will be located with hydrovac excavation equipment, which is a method that uses a high-pressured water device to break down the soil and a vacuum to lift the slurry into a debris tank. The ends of the pipes will then be exposed by backhoe excavation. Shoring will need to be installed for safe access to the pipeline. After each pipe has been exposed and investigated to address any source of water intrusion into the pipe, the pipes will be depressurized, drained, inspected, blocked, and a section will be cut and removed. This inspection and preparation will allow hydroblasting to prepare the pipe for RVI. All water will be collected into Baker tanks, tested, and disposed of appropriately.

### Group C

Six Irrigation Crossing pipes located at MP 161.62, MP 137.83, MP 107.15, MP 102.88, MP 91.36, and MP 91.35 were determined to be in service. These pipes will be located with hydrovac equipment, excavated, inspected, depressurized, and drained. This

inspection and preparation will allow hydroblasting to prepare the pipes for RVI. All water will be collected into Baker tanks, tested, and disposed of appropriately.

After each Irrigation Crossing has been inspected, they will either be permanently abandoned and replaced, or the site will be returned to pre-construction condition.

## **Site Description**

The Project includes both the Aqueduct primary road and secondary road and DWR's right-of-way (ROW), with the ROW being the work area. The habitat consists largely of non-native grass, Russian thistle (*Salsola* sp.), and bare ground. The habitat is highly disturbed due to continual DWR maintenance of the Aqueduct and ROW and heavy agricultural activity. Adjacent land use to the ROW includes annual crops and orchards.

## **Methodology**

Environmental Scientists (ES) Foung Vang, Alex Single, Nicholas Teague, Guillermo Coronado, and Fish and Wildlife Scientific Aid Marina Raya conducted an overall site assessment over a 7-day survey period (October 3, 4, 7, 8, 9, 10 and 11, 2019). These surveys consisted of surveying 1,640 feet upstream and downstream of both sides of the Aqueduct at each Irrigation Crossing. On October 3, 4, and 7 to 11, 2019, Environmental Scientists (ES) Foung Vang, Alex Single, Nicholas Teague, Guillermo Coronado, and Fish and Wildlife Scientific Aid Marina Raya conducted an overall site assessment which included surveying 1640 feet upstream and downstream of both sides of the Aqueduct at each Irrigation Crossing.

The overall site assessment was conducted to assess the habitat associated with the Project area and survey for species that have the potential to be in the area. The density, type, and proximity of burrows and canid dens were assessed. The potential for listed species was also assessed. The California Natural Diversity Database (CNDDB 2019), California Native Plant Society (CNPS 2019), and the United States Fish and Wildlife Information for Planning and Consultation (IPaC 2019) were consulted. Listed special status species were recorded within a 5-mile radius of the Project area (Table 1), but those species with habitat associated with the Project area were considered potential to occur.

**Table 1.** Special Status Species Recorded Near the Project Area; CNDDDB, CNPS, and the IPaC.

<b>Common Name</b>	<b>Scientific Name</b>	<b>Federal T/E</b>	<b>State T/E/SSC</b>	<b>CNPS</b>
San Joaquin kit fox	<i>Vulpes macrotis mutica</i>	E	T	
American badger	<i>Taxidea taxus</i>		SSC	
San Joaquin antelope squirrel	<i>Ammospermophilus nelsoni</i>		T	
Giant kangaroo rat	<i>Dipodomys ingens</i>	E	E	
Tulare grasshopper mouse	<i>Onychomys torridus</i>		SSC	
Swainson's hawk	<i>Buteo swainsoni</i>		T	
*Golden eagle	<i>Aquila chrysaetos</i>		FP	
Northern harrier	<i>Circus hudsonius</i>		SSC	
Burrowing owl	<i>Athene cunicularia</i>		SSC	
Tricolored blackbird	<i>Agelaius tricolor</i>		T	
Yellow-headed blackbird	<i>Xanthocephalus xanthocephalus</i>		SSC	
Loggerhead shrike	<i>Lanius ludovicianus</i>		SSC	
*Blunt-nosed leopard lizard	<i>Gambelia sila</i>	E	E	
Northern California legless lizard	<i>Anniella pulchra</i>		SSC	
San Joaquin coachwhip	<i>Coluber flagellum ruddocki</i>		SSC	
Western pond turtle	<i>Actinemys marmorata</i>		SSC	
Spiny-sepaled button-celery	<i>Eryngium spinosepalum</i>			1B.2
Heartscale	<i>Atriplex cordulata</i>			1B.2
Munz's tidy-tips	<i>Layia munzii</i>			1B.2
San Joaquin woollythreads	<i>Monolopia congdonii</i>			1B.2
Panoche pepper-grass	<i>Lepidium jaredii album</i>			1B.2

\*Fully protected; E = Endangered; T = Threatened; SSC = Special Species of Concern; 1B.2 = Plants Rare, Threatened, or Endangered in California and Elsewhere

## Results

Due to the highly disturbed ROW, the Project area does not contain suitable habitat for San Joaquin kit fox, San Joaquin antelope squirrel, giant kangaroo rat, Tulare grasshopper mouse, tricolored blackbird, yellow-headed blackbird, blunt-nosed leopard lizard, northern California legless lizard, western pond turtle, spiny-sepaled button-celery, heartscale, Munz's tidy-tips, San Joaquin woollythreads, and Panoche pepper-grass. None of these species were observed during the overall site assessment.

Some of the Irrigation Crossings had large numbers of small mammal burrows, with an accumulated total of approximately 577 burrows. California ground squirrels (*Otospermophilus beecheyi*) were the only observable rodent (Figure 2). A total of 47 canid-sized dens (Figure 4) and eight burrowing owl (BUOW) burrows (Figure 3) were documented in the ROW near several of the Irrigation Crossings (**Table 2**) (**Appendix A**). During the October 8, 2019 survey, a BUOW was observed near BUOW burrow #3 and #4 near the MP 137.32 Irrigation Crossing on the right side of the Aqueduct (See Appendix A).

**Table 2.** Burrows and Dens Observed During Surveys.

Milepost	Canid Dens	Active BUOW Burrows	Small Mammal Burrows
72.95	0	0	21
81.11	6	0	105
*91.35/91.36	2	0	1
92.72	11	0	2
102.88	0	0	22
107.15	1	0	9
128.89	0	0	0
129.63	0	0	2
135.98	1	2	5
*137.32/137.83/138.24	8	5	24
140.50	1	0	74
141.55	0	0	Over 110
*161.62/162.08	5	1	27
*163.18/163.67	12	0	Over 175
Total:	47	8	Minimum 577

\*Multiple mileposts are placed together due to overlapping BUOW restrictive areas.

**Figure 2.** Small Mammal Burrow Complex near MP 140.50 Irrigation Crossing on the Right Side of the Aqueduct.



**Figure 3.** BUOW Burrow #3 in the ROW near MP 137.32 Irrigation Crossing on the Right Side of the Aqueduct.



**Figure 4.** Canid Den in the ROW near MP 140.50 Irrigation Crossing on the Right Side of the Aqueduct.



## **Discussion**

The 19 Irrigation Crossings are adjacent to heavily disturbed areas with intense agriculture activity and degraded habitat, which are not suitable for many of the special status species listed in Table 1. However, the Project has the potential to impact documented BUOWs, BUOW burrows, canid dens, and small mammals. Burrowing owls are protected under the Migratory Bird Treaty Act (MBTA), and canid dens must be avoided due to potential presence of San Joaquin kit fox. San Joaquin kit fox occurrences were recorded in the vicinity of the Irrigation Crossings in CNDDDB. Many of the Irrigation Crossings have nearby small mammal burrows that are potential BUOW burrows. Although these burrows do not have BUOW sign (such as whitewash, owl pellets, feathers, and prey remains), they are large enough (with at least a 3-inch diameter) to be inhabited by a BUOW.

## **Minimization Measures**

To avoid and minimize potential impacts to sensitive species and their habitat, the following measures will be applied:

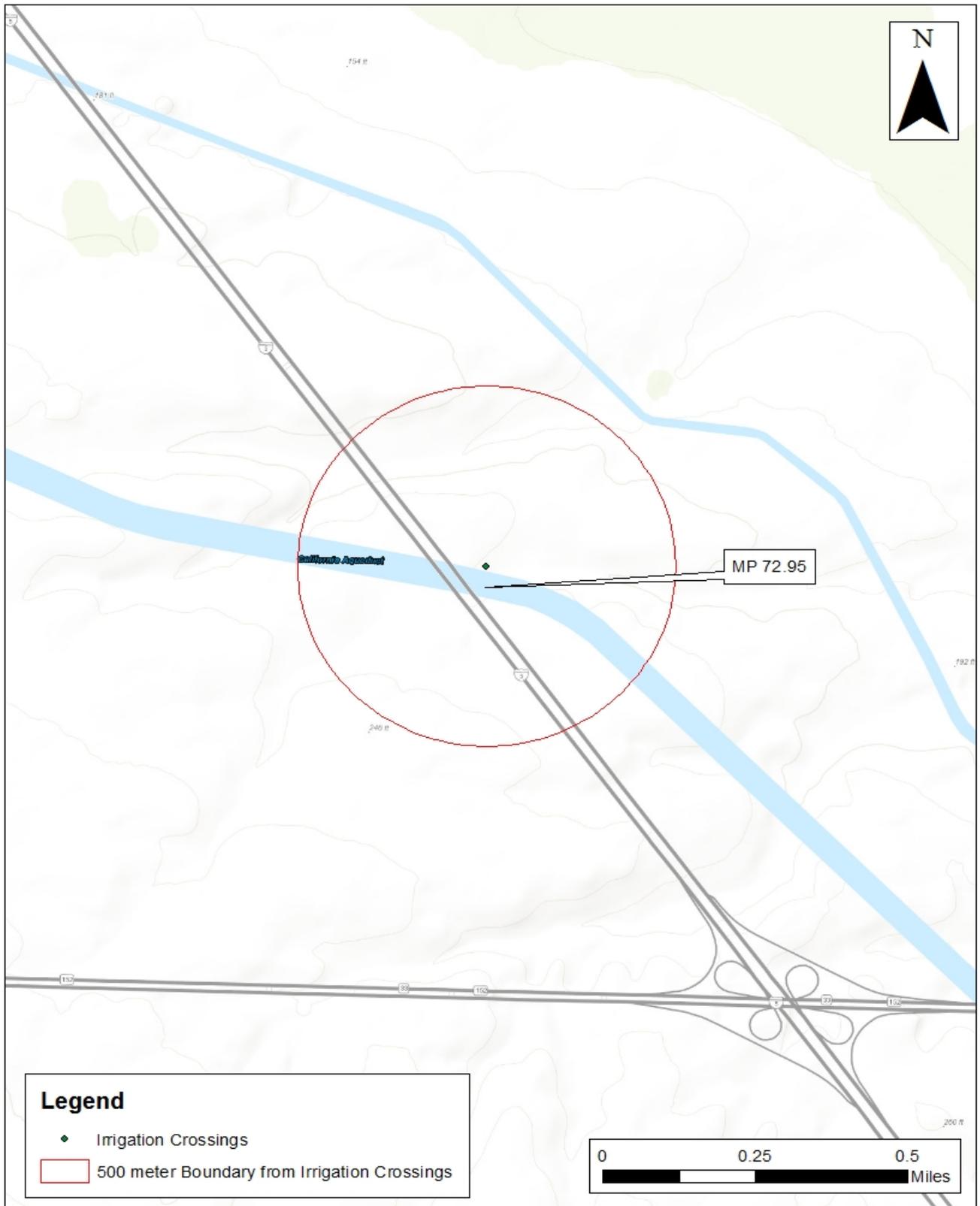
- Within the 1640 feet impact area, one-way doors will be temporarily installed in BUOW burrows, canid dens will be burrow probed and temporary one-way doors will be installed, and small mammal burrows will be investigated with a burrow probe and temporarily blocked with sandbags or similar material (Appendix B).
- All work and staging will be within a 300 feet work footprint at each Irrigation Crossing, and parking will be on the paved Aqueduct road, graveled shoulders, or work footprint. No parking on embankments, embankment roads, and embankment slopes.
- Paved roads will be used to access and exit the work area. Alternate routes on dirt roads will require ES approval.
- Exclusion areas surrounding burrows will be designated with flagged stakes to prevent disturbance to these areas. An ES will monitor all construction work.
- All trenches less than 2 feet deep will have escape ramps made of sand bags or similar material, with a 2:1 slope, and trenches greater than 2 feet deep will be covered with plywood or similar material and weighed down.
- Work will only occur during daylight hours.

If these measures are not followed there can be potential permanent impacts to these special status species and their habitat. These impacts might require mitigation, and regulatory agencies will need to be consulted.

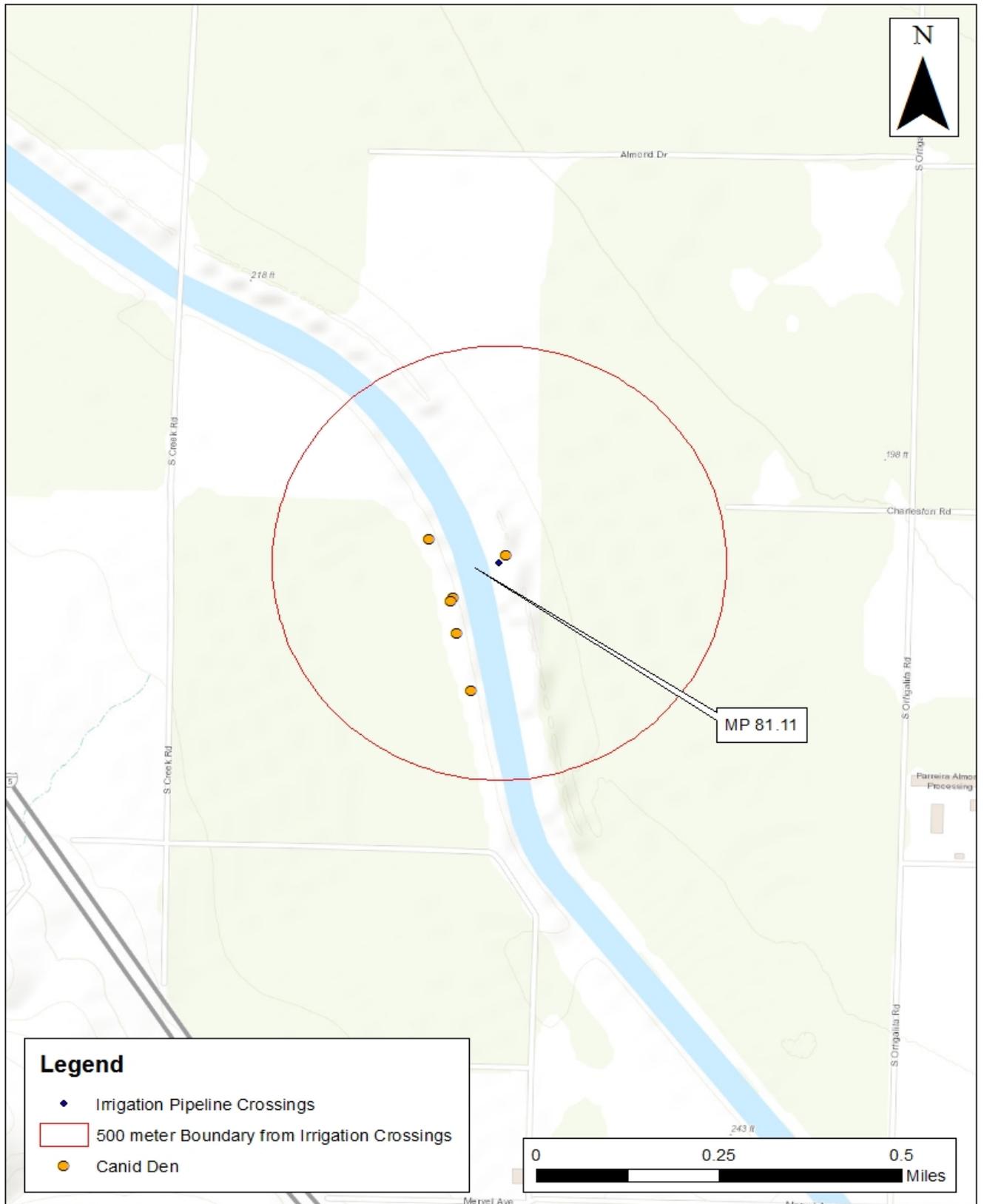
## Appendix A

### Maps of Irrigation Crossings and Burrow and Den Locations

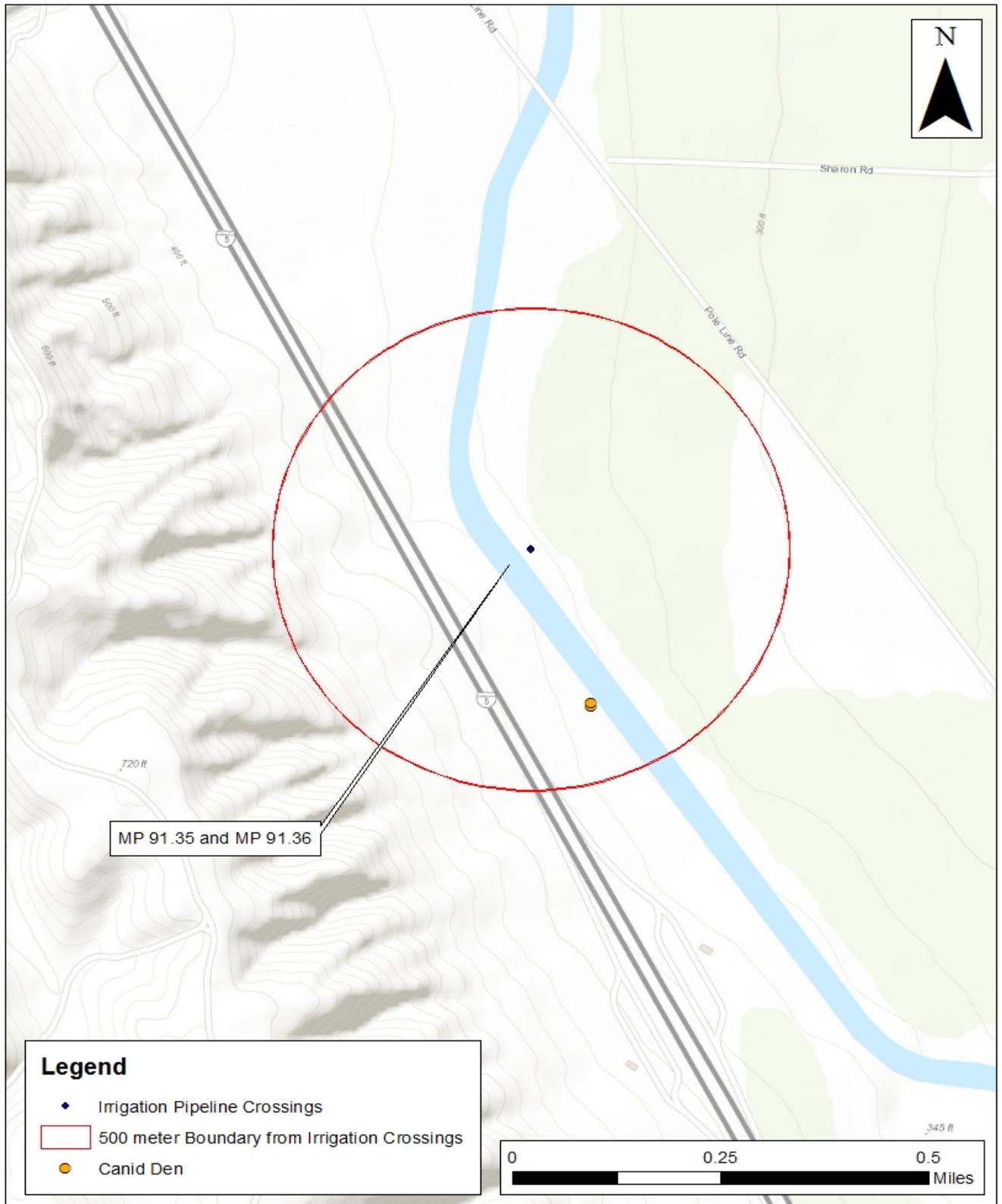
**Figure 5.** MP 72.95 Irrigation Crossing on the Aqueduct.



**Figure 6.** MP 81.11 Irrigation Crossing and Canid Dens on the Aqueduct.



**Figure 7.** MP 91.35 and MP 91.36 Irrigation Crossings and Canid Dens on the Aqueduct.



**Figure 8.** MP 92.72 Irrigation Crossing and Canid Dens on the Aqueduct.

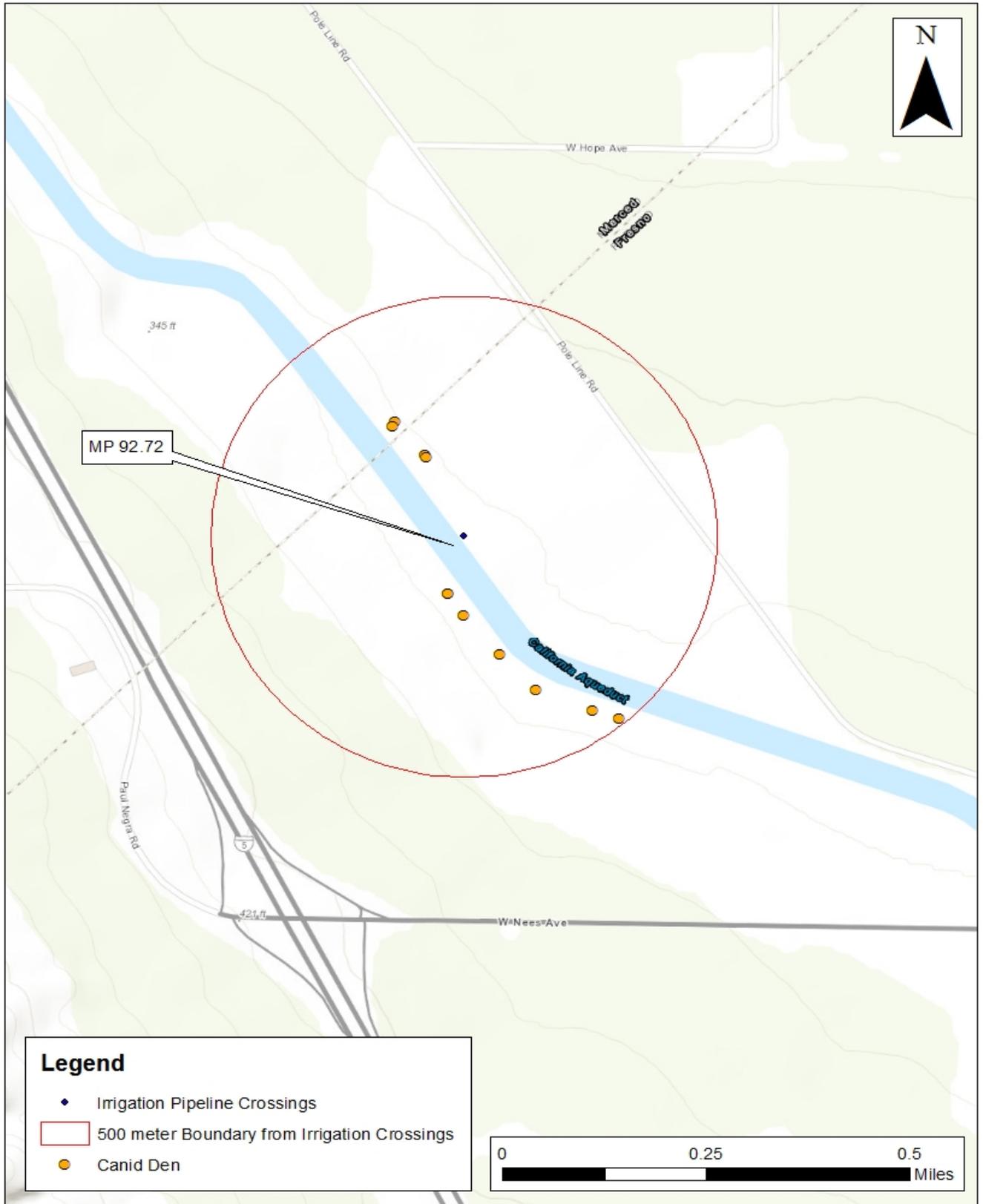
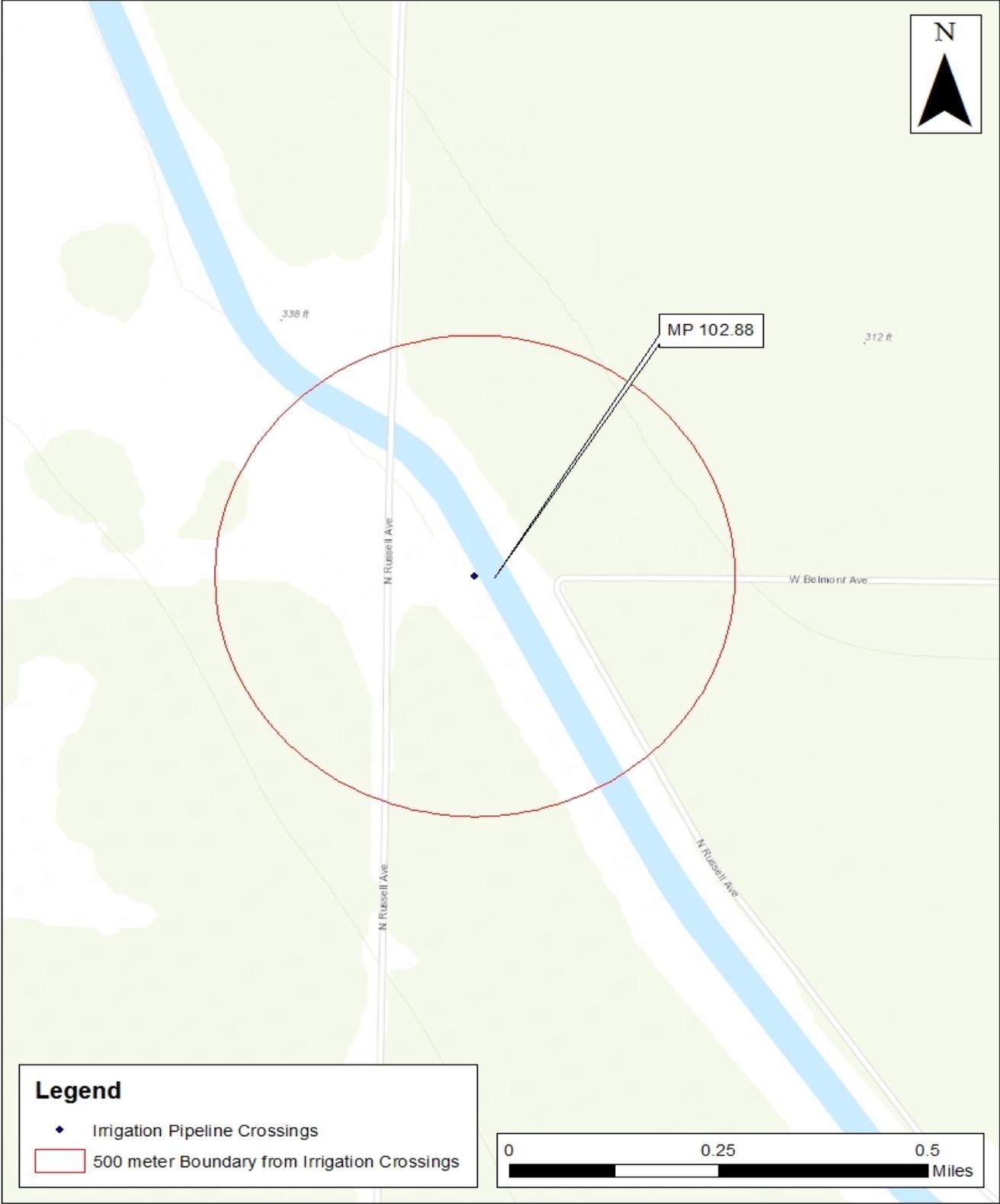
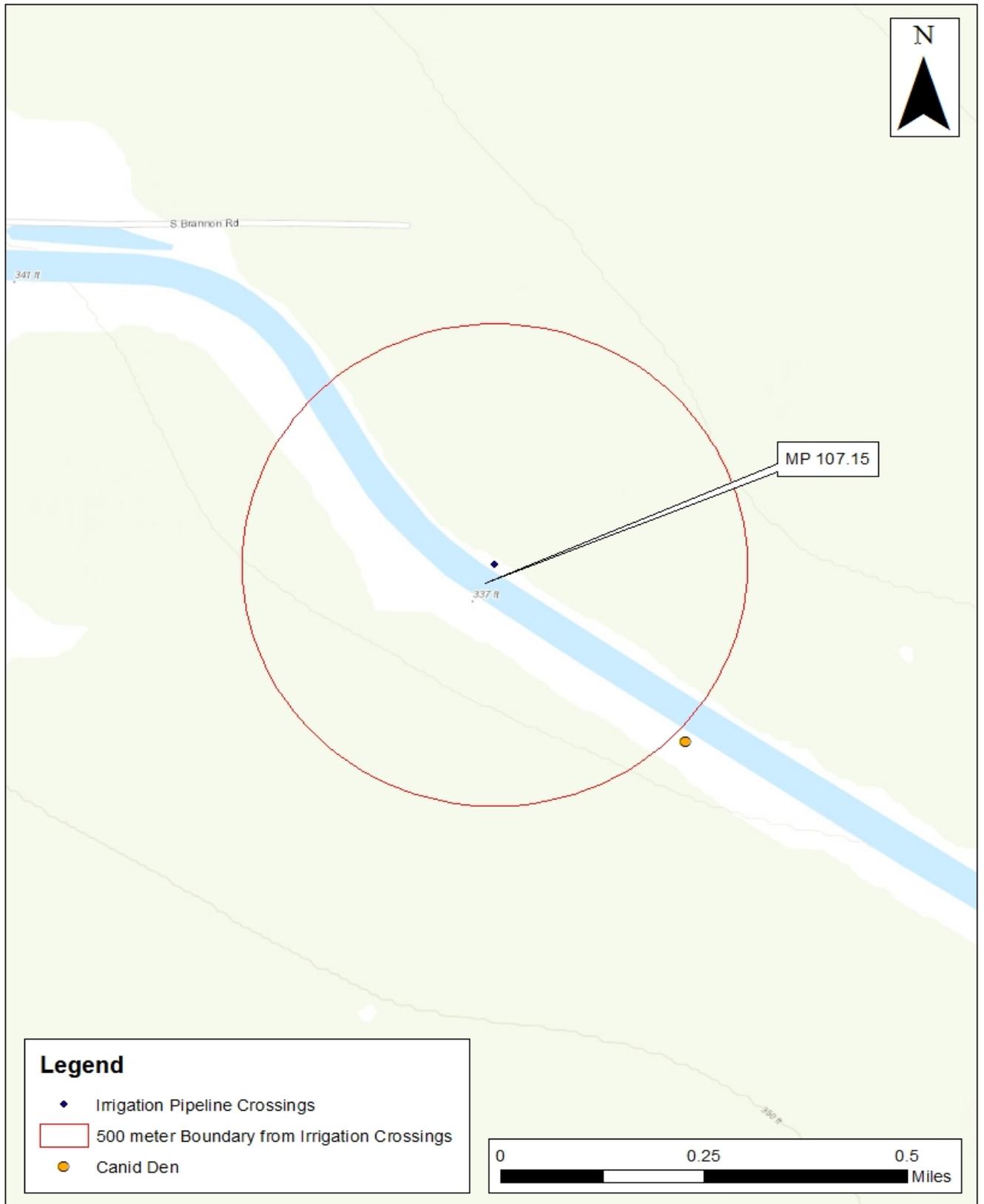


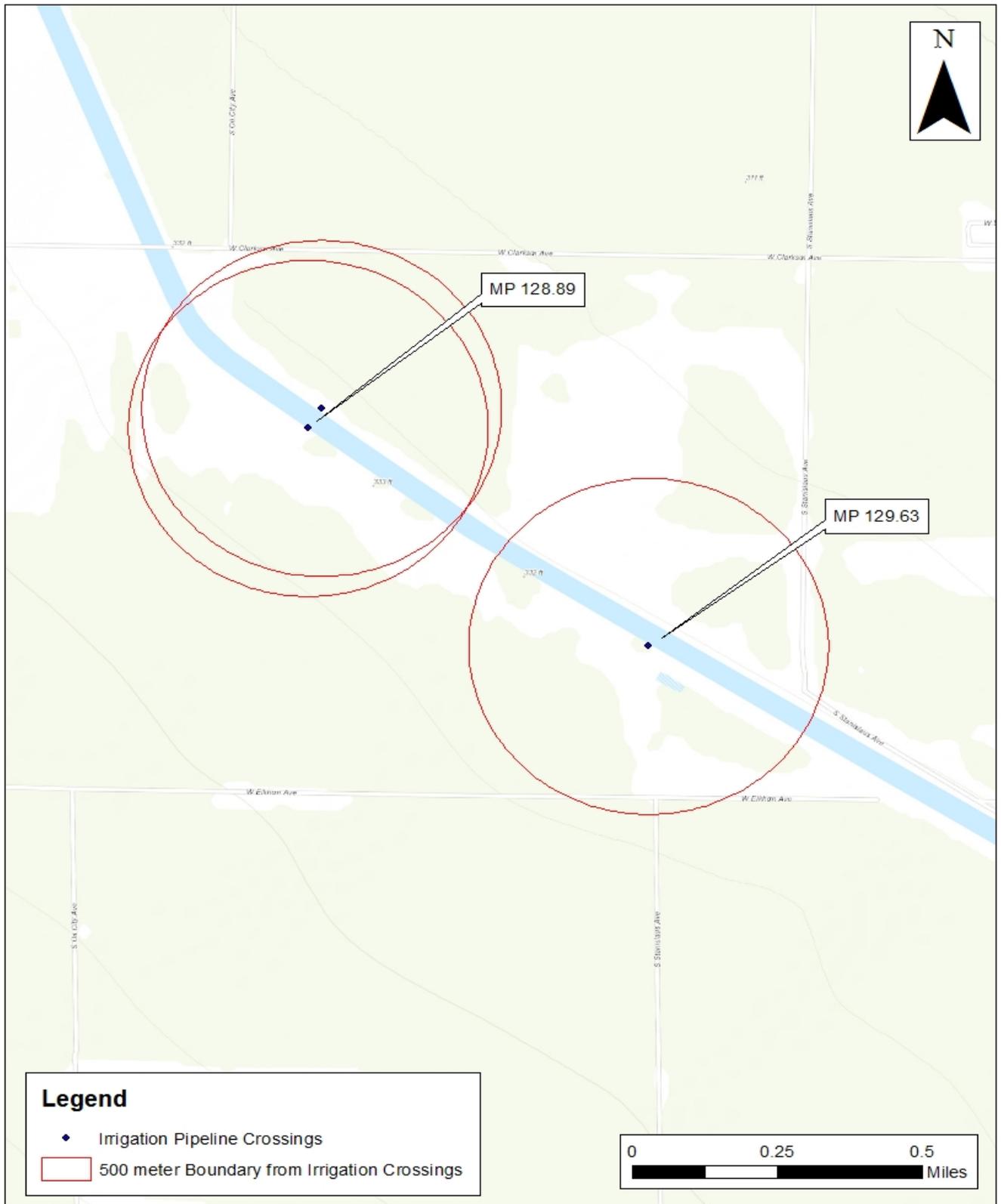
Figure 9. MP 102.88 Irrigation Crossing on the Aqueduct.



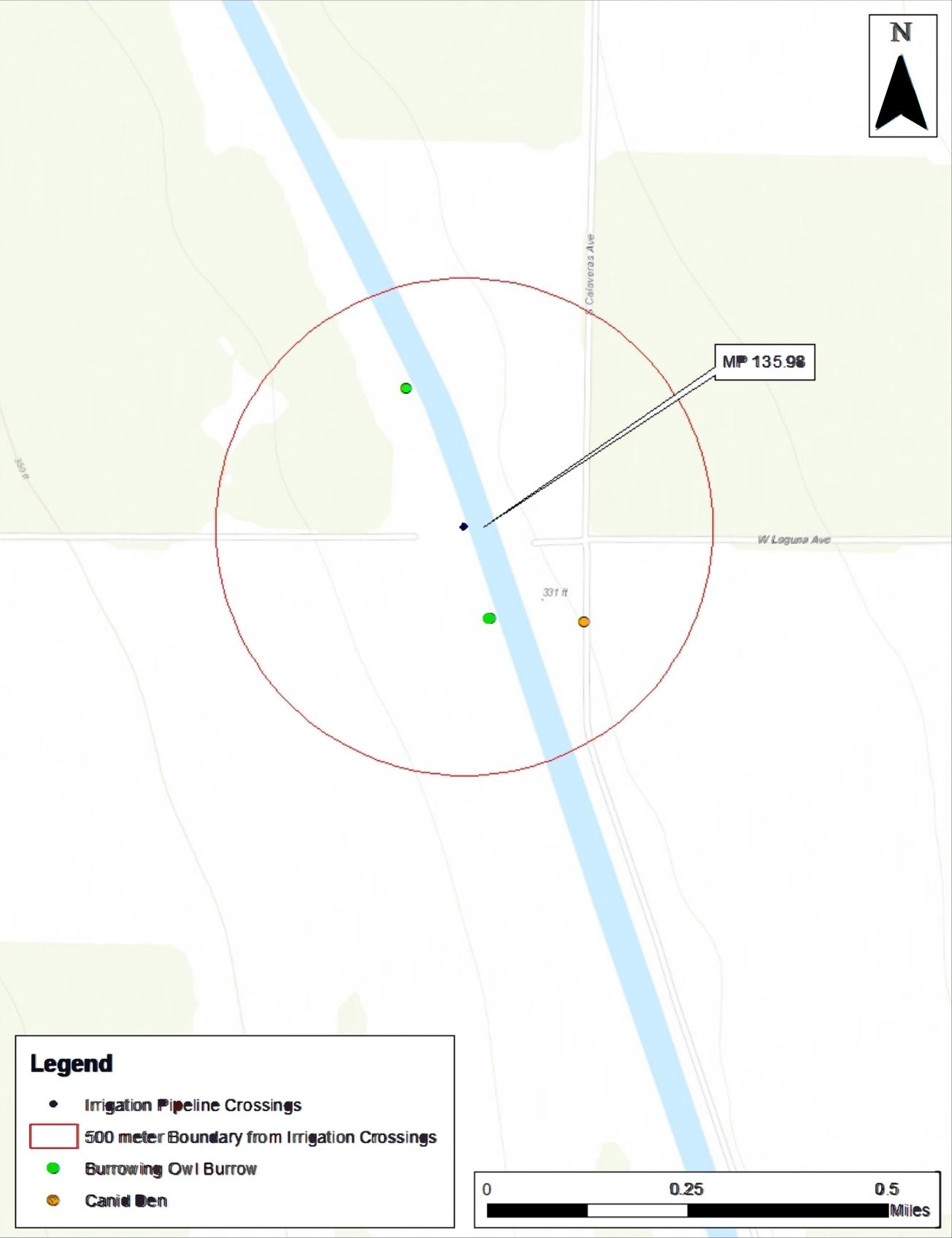
**Figure 10.** MP 107.15 Irrigation Crossing and a Canid Den on the Aqueduct.



**Figure 11.** MP 128.89 and MP 129.63 Irrigation Crossings on the Aqueduct.

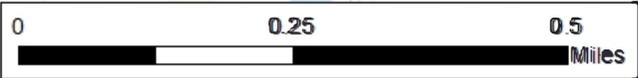


**Figure 12.** MP 135.98 Irrigation Crossing, BUOW Burrow, and Canid Den on the Aqueduct.

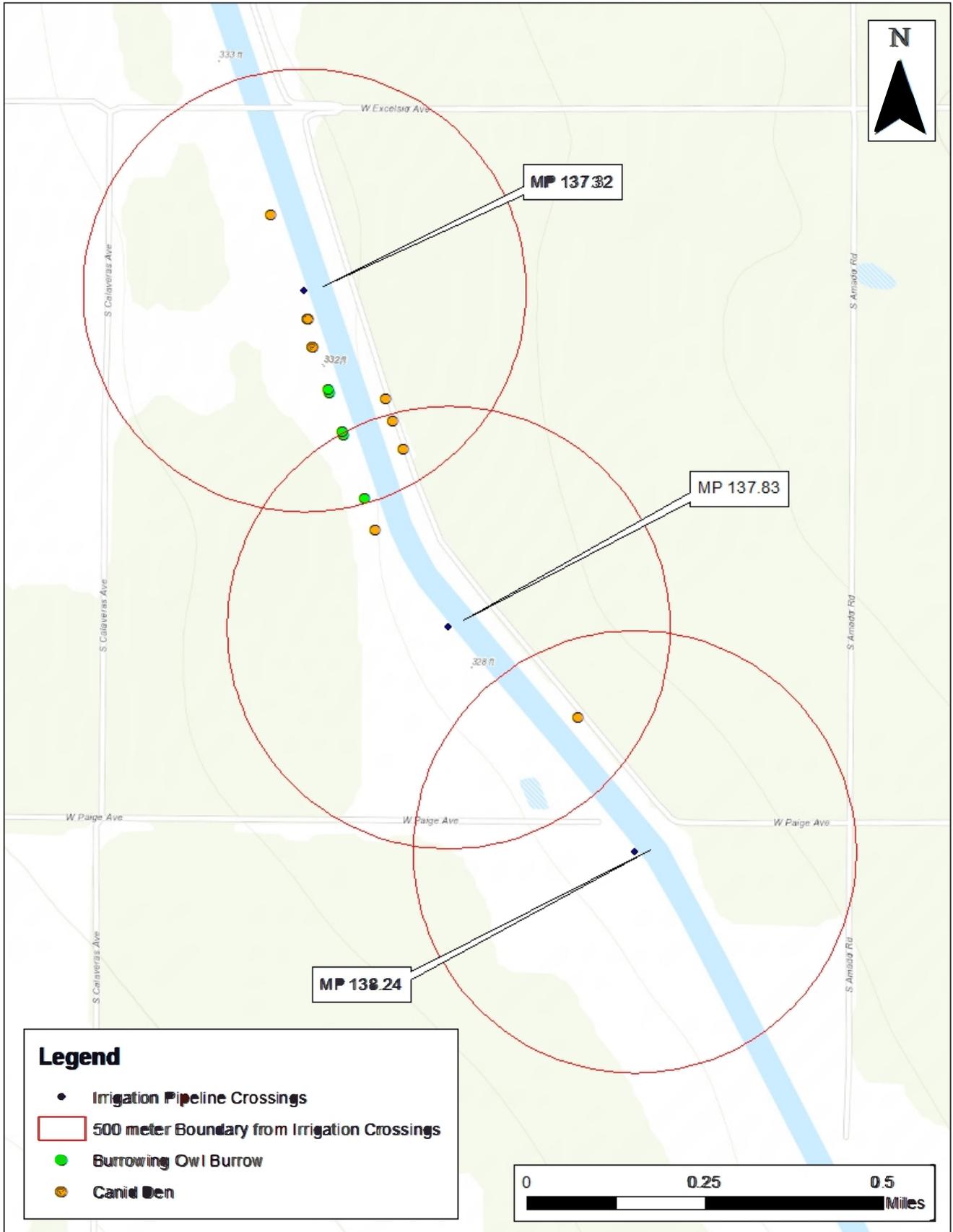


**Legend**

- Irrigation Pipeline Crossings
- ◻ 500 meter Boundary from Irrigation Crossings
- Burrowing Owl Burrow
- Canal Den



**Figure 13.** MP 137.32, MP 137.83, and MP 138.24 Irrigation Crossings, BUOW Burrows, and Canid Dens on the Aqueduct.



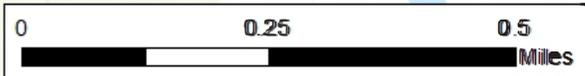
MP 137.32

MP 137.83

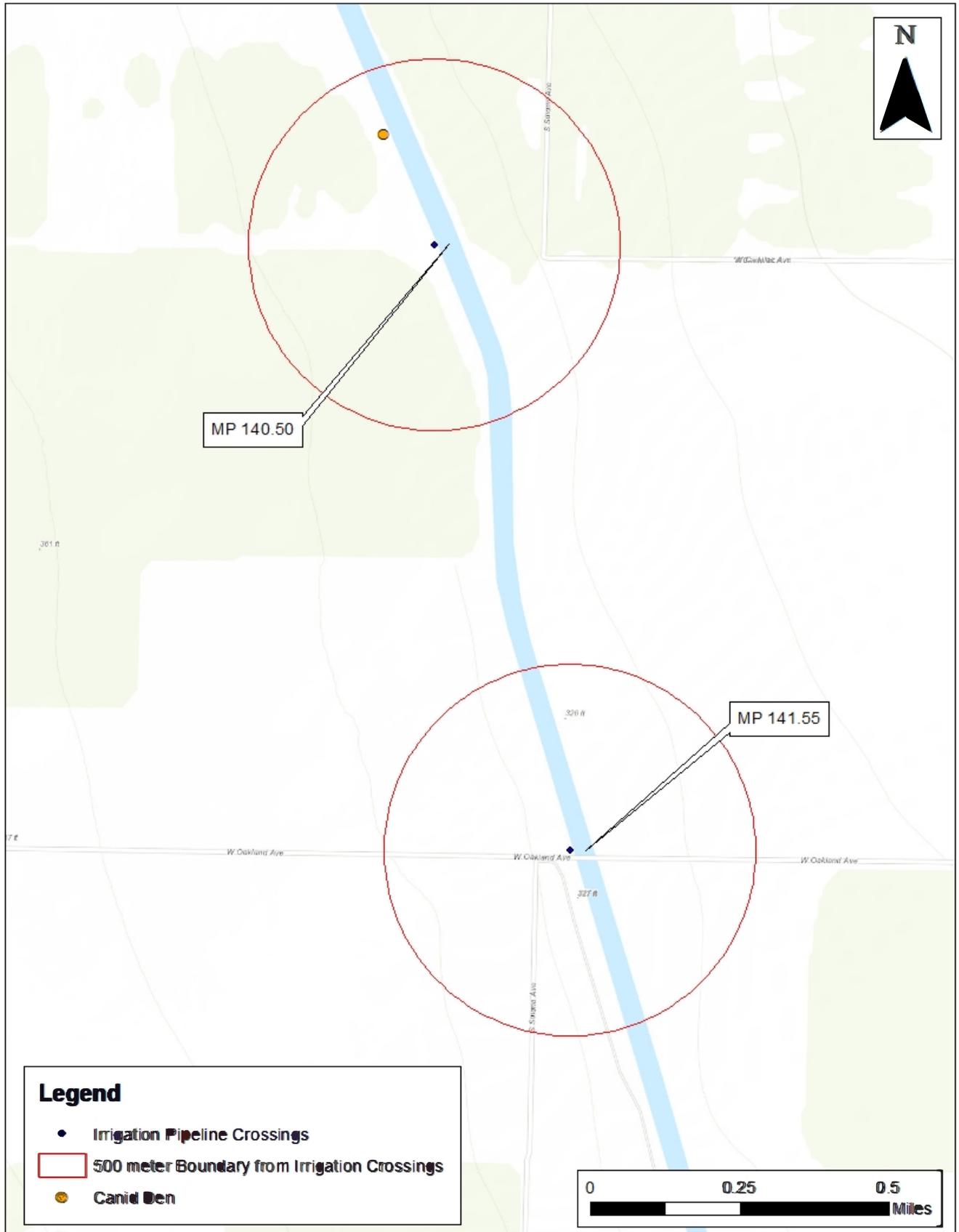
MP 138.24

### Legend

- Irrigation Pipeline Crossings
- 500 meter Boundary from Irrigation Crossings
- Burrowing Owl Burrow
- Canid Den

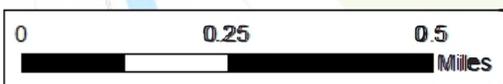


**Figure 14.** MP 140.50 and 141.55 Irrigation Crossings and a Canid Den on the Aqueduct.

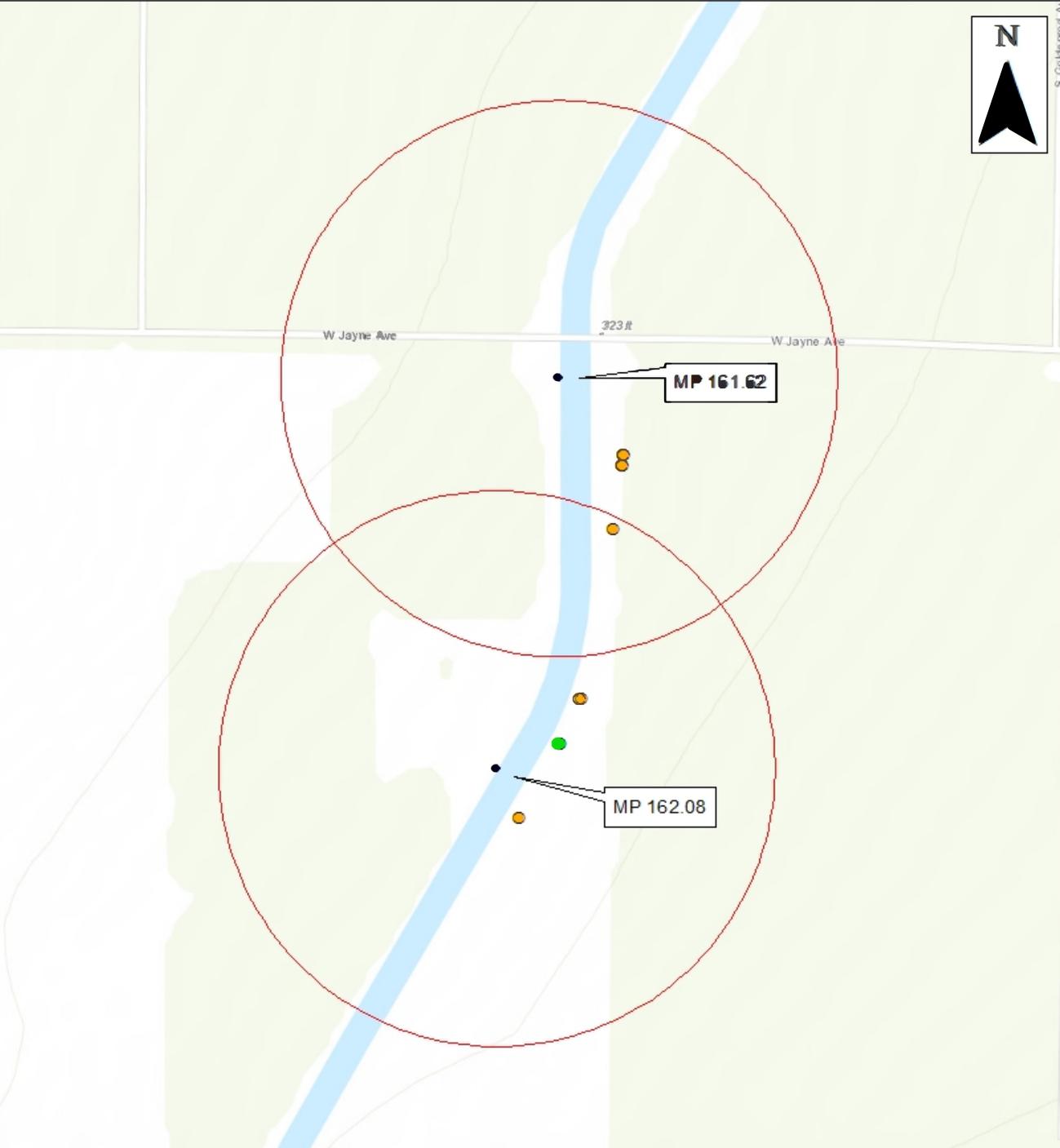


**Legend**

- Irrigation Pipeline Crossings
- ◻ 500 meter Boundary from Irrigation Crossings
- Canid Den

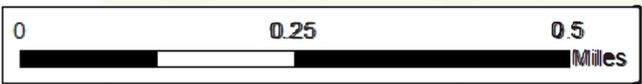


**Figure 15.** MP 161.62 and 162.08 Irrigation Crossings, BUOW Burrow, and Canid Dens on the Aqueduct.

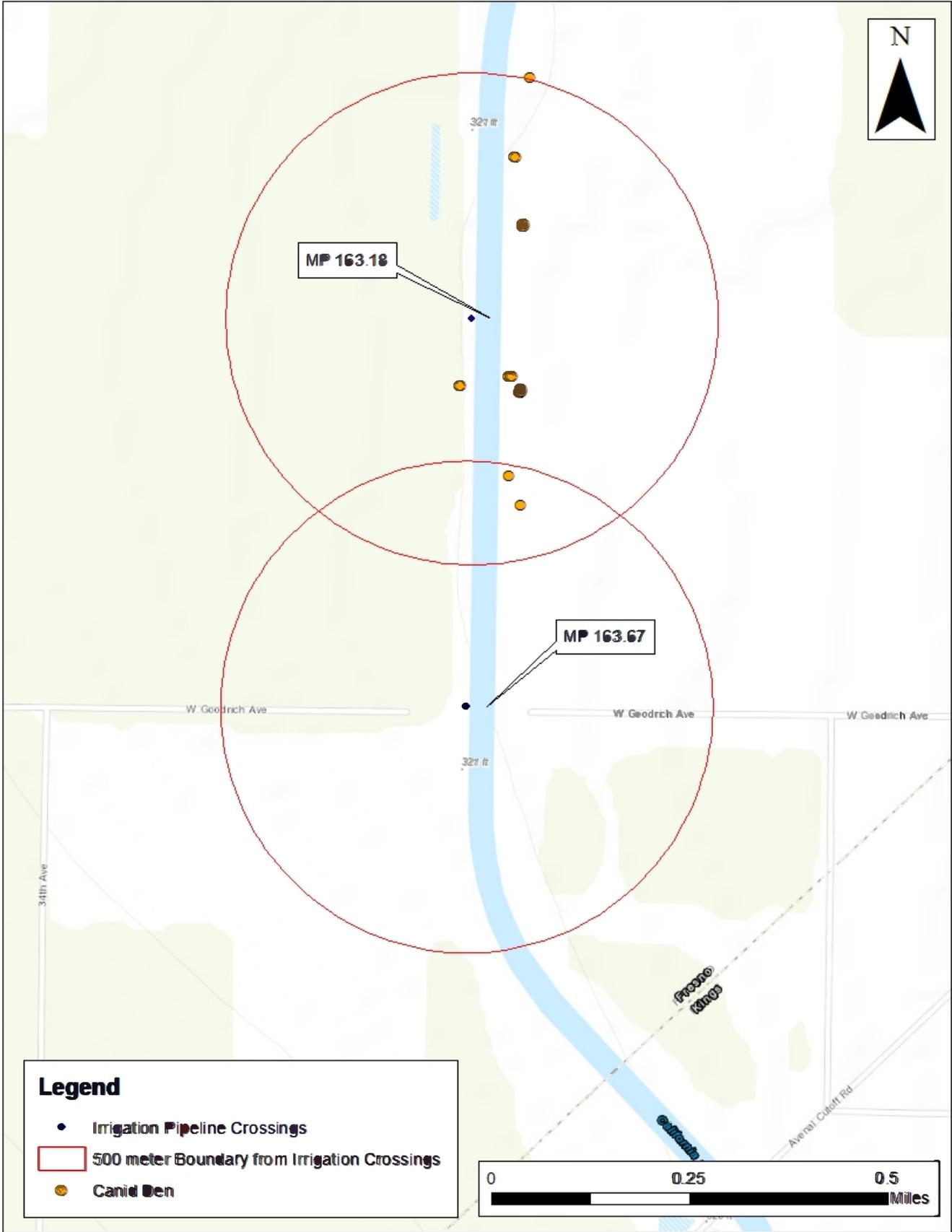


**Legend**

- Irrigation Pipeline Crossings
- 500 meter Boundary from Irrigation Crossings
- Burrowing Owl Burrow
- Canid Den



**Figure 16.** MP 163.18 and 163.67 Irrigation Crossings and Canid Dens on the Aqueduct.



# Appendix D

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