Draft Environmental Assessment
Issuance of Right-of-Way to Oakdale Irrigation District for the Two-Mile Bar Tunnel Project Stanislaus River Parks/ Two-Mile Bar Recreation Area

JUNE 2014

Federal Lead Agency

US Army Corps of Engineers ®
Sacramento District

Project Sponsor/Proponent

Oakdale Irrigation District

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO, CALIFORNIA, 95814-2922

REPLY TO
ATTENTION OF
Environmental Resources Branch

FINDING OF NO SIGNIFICANT IMPACT*

Issuance of Right-of-Way to Oakdale Irrigation District for Use of the Two-Mile Bar Access Road and for Permission to Construct a 500-foot Section of the Two-Mile Bar Tunnel
Stanislaus River Parks/Two-Mile Bar Recreation Area
Tuolumne and Stanislaus Counties, California

I have reviewed and evaluated the information in this Environmental Assessment (EA) for the Corps' issuance of a right-of-way to Oakland Irrigation District (OID) for the Two-Mile Bar Tunnel Project near the town of Knights Ferry in Tuolumne and Stanislaus Counties, California. The Corps' proposed action is to issue OID a right-of-way for accessing adjacent private lands and for tunneling under Corps' property located at the Two-Mile Bar Recreation Area. The Corps' involvement is authorized by Section 10 of the U.S. Code, which provides the agency to grant "easements for rights-of-way over, in, and upon public lands permanently withdrawn or reserved … for canals and tunnels" (10 U.S.C. 2668).

Once issuance of the right-of-way is granted, OID will (1) use the Corps' Two-Mile Bar Access Road for construction related activities on private lands and under Corps' property, and (2) Construct and maintain a 500-foot section of the new Two-Mile Bar Tunnel, under Corps' property to continue uninterrupted conveyance of irrigation water to the South Main Canal.

Since approximately 500 linear feet of the new tunnel crosses under the Two-Mile Bar Recreation Area, that is currently under the jurisdiction and management of the Corps, OID is requesting right-of-way permission to use the Two-Mile Bar Road for access to construct, operate, and maintenance of the new tunnel, accessing private property to construct tie-ins to the South Main Canal, as well as maintenance of the mitigation plantings. The right-of-way would include a 100-foot-wide construction easement and use of access roads leading to and across Corps' property.

During this review, the possible consequences of the work described in the EA have been studied with consideration given to environmental, socioeconomic, and engineering feasibility. In evaluating the effects of the proposed project, specific attention has been given to significant environmental conditions that could potentially be affected. I have also considered the views of other interested agencies, organizations, and individuals concerning the study. The effects and mitigation measures have been coordinated with the U.S. Fish and Wildlife Service, Central Valley Regional Water Quality Control Board, San Joaquin Valley Air Pollution Control District, and State Historic Preservation Officer.

Based on my review of the EA and my knowledge of the project area, I am convinced that issuing OID right-of-way permission to access Corps property to construct the Two-Mile Bar Tunnel Project is a logical and desirable alternative. Furthermore, I have determined that the work would have no significant, long-term effects on the environment. All construction will be implemented in strict compliance with applicable Federal, State, and local laws and regulations.

* Draft - To be signed by the District Engineer after the public review period, if appropriate.

Based on the results of the environmental evaluation and completion of interagency coordination, I have determined that the EA and Finding of No Significant Impact provides adequate documentation and that no further environmental document is required.

_____
Date

_____
Michael J. Farrell
Colonel, U.S. Army
District Commander

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Acronyms and Abbreviations

°F degree Fahrenheit
AB Assembly Bill
BMP best management practice
CARB California Air Resources Board
CDFW California Department of Fish and Wildlife
CEQA California Environmental Quality Act
CNDDB California Natural Diversity Database
Corps U.S. Army Corps of Engineers
CTS California tiger salamander
CWA Clean Water Act
DOC California Department of Conservation
EA environmental assessment
ECSPP erosion control and spill prevention plan
EPA U.S. Environmental Protection Agency
ESA Endangered Species Act of 1973
FONSI Finding of No Significant Impact
LOS Level of Service
MLD Most Likely Descendant
NEPA National Environmental Policy Act
NO_x nitrogen oxide
NPDES National Pollutant Discharge Elimination System
NRCS Natural Resources Conservation Service
NRHP National Register of Historic Places
OID Oakdale Irrigation District
PM_{10} particulate matter less than 10 micrometers in aerodynamic diameter
Project Two-Mile Bar Tunnel Project
ROW Right-Of-Way
ROG reactive organic gas
SJKF San Joaquin kit fox
SJVAPCD San Joaquin Valley Air Pollution Control District
SPCCP Spill Prevention Control and Countermeasures Plan
SR State Route
SWPPP stormwater pollution prevention plan
T&E threatened and endangered
Ton/year ton(s) per year
U.S.C. United States Code
USFWS U.S. Fish and Wildlife Service
VELB valley elderberry longhorn beetle
WBCVRQCB Water BoardCentral Valley Regional Water Quality Control Board
WRP Water Resources Plan

1.0 PURPOSE and NEED

1.1 Background

Oakdale Irrigation District (OID) is a public agency organized on November 1, 1909, under the authorization of the Wright Act. OID is located in the northeast portion of the San Joaquin Valley, about 30 miles southeast of Stockton and 12 miles northeast of Modesto. The OID service area consists of 72,500 acres between the Sierra Nevada Mountains and the Central Valley along the San Joaquin–Stanislaus County line, surrounding the city of Oakdale and bordering the cities of Riverbank, Escalon, and Modesto. OID maintains more than 330 miles of laterals, pipelines, and tunnels; 29 production wells; 3 regulating reservoirs; and 43 reclamation pumps to serve local customers. OID currently serves approximately 2,800 agricultural customers on approximately 57,000 acres of serviceable land. OID also provides water to about 700 domestic accounts, primarily east of Oakdale. In association with the Two-Mile Bar reach of the Stanislaus River, Figure 1-1 illustrates the regional location of the OID service area; and Figure 1-2 illustrates the OID service area and canal system.

Water is diverted from the Stanislaus River at Goodwin Dam into the Joint Main Canal, which serves both OID and South San Joaquin Irrigation District, and the South Main Canal, which supplies the entire southern portion of the OID service area. The canal's overall length from Goodwin Dam to Robert Van Lier Reservoir is approximately 20 miles. The South Main Canal supplies about 32,000 irrigated acres (60 percent of OID irrigated land) and it is located on property managed by OID. The proposed action to construct the tunnel is partially aligned on U.S. Army Corps of Engineers (Corps) property and the remainder of the tunnel is aligned on private property. In association with OID constructing the tunnel, the portion of the South Main Canal and its new upstream and downstream diversion tie-in would also require OID to use Two-Mile Bar Recreation Area Access Road through Corps property.

OID has requested to use the Two-Mile Bar Road for facility access and maintenance and is requesting that the Corps grant them a right–0- way for the portion of the new tunnel crossing under Corps property, as well as construction and maintenance access using Federally owned roads found leading to and within the Corps' Two-Mile Bar Recreation Area. Granting OID the right-of-way permission requires the preparation of this Environmental Assessment (EA) and review in compliance with the National Environmental Policy Act (NEPA). OID completed the California Environmental Quality Act (CEQA) review as the lead agency under a separate process by preparing an Environmental Impact Report (EIR) for the entire tunnel project in July 2010, which included their previous coordination and informal consultation with the U.S. Fish and Wildlife Service on effects to Federally listed species.

1.2 Proposed Action

The proposed federal action for the Two-Mile Bar Tunnel project is for Corps to grant OID a right-of-way to use Federal lands (Two-Mile Bar Recreation Area and Two-Mile Bar Recreation Area Access Road). Granting a right-of way is needed so OID can construct and maintain a bypass underground tunnel and access a high-hazard area of that portion of the South Main Canal system located at the Two-mile Bar Recreation Area. This portion of the canal is currently threatened with frequent damage from falling boulders and rocks and will be no longer be used for conveying water by OID after the tunnel is constructed. OID is the project proponent and is

solely responsible for the design, construction, mitigation, and maintenance of the OID Two-Mile Bar Tunnel project. The Corps is not a cost sharing partner and does not have discretion over the design, sighting of the project, mitigation, or operation and maintenance of the tunnel or mitigation plantings. The Corps can condition actions that occur on Corps property that might interfere with the project operations, such as traffic control, closures, work hours, etc., but these conditions are limited to the use of the lands, not the overall design or functioning of the OID tunnel. The scope of the Corps' proposed action is limited to the discretionary issuance of a right-of-way to OID for use of the Stanislaus River Park's Two-Mile Bar Recreation Area and its access roads and for permission to construct and maintain a 500-foot section of the concrete-lined tunnel, which the tunnel would range between 100 to 200 feet underneath the Corps' property. Details of the preferred alternative and project description are provided in Sections 2. 2 through 2.4.

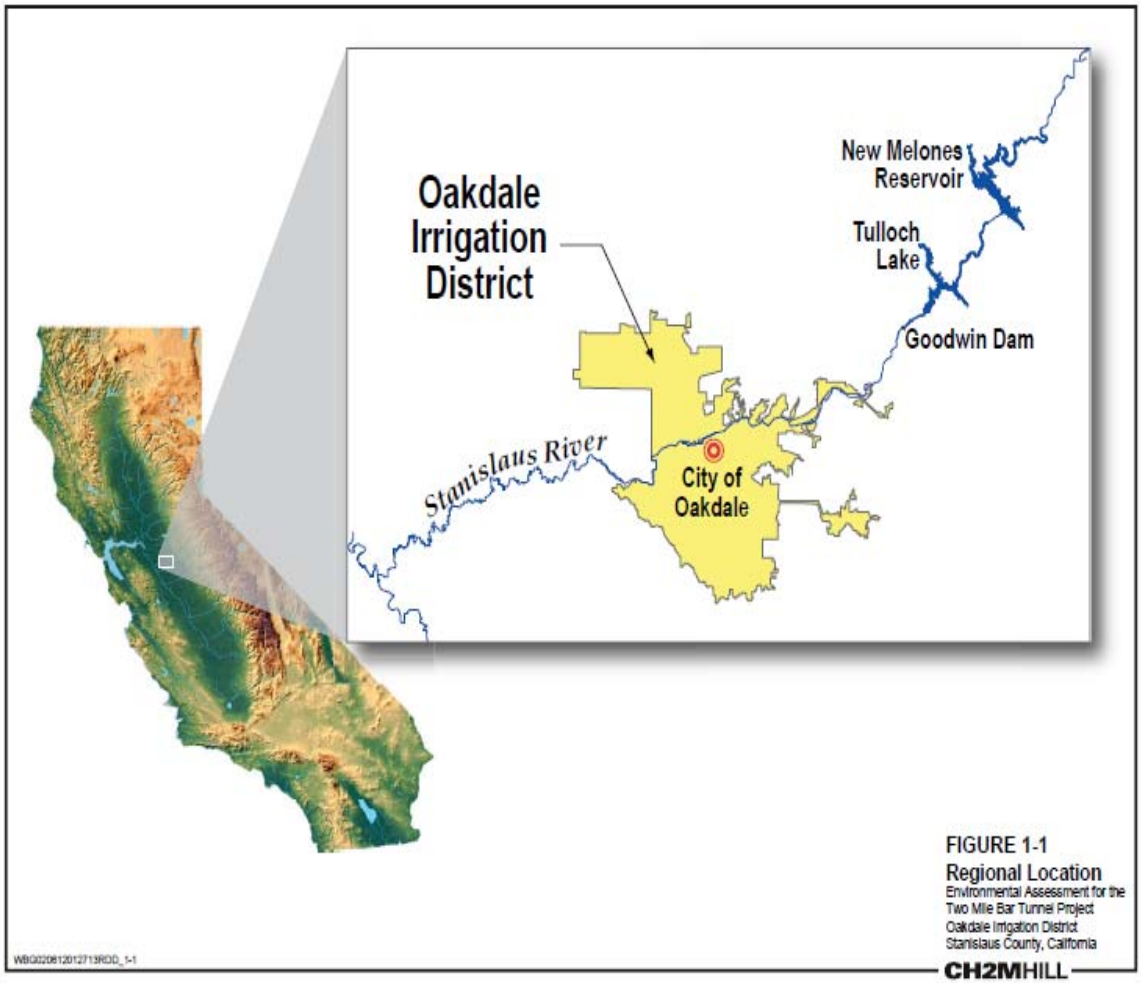

Figure 1-1 Regional Location of Two-Mile Bar Tunnel Project

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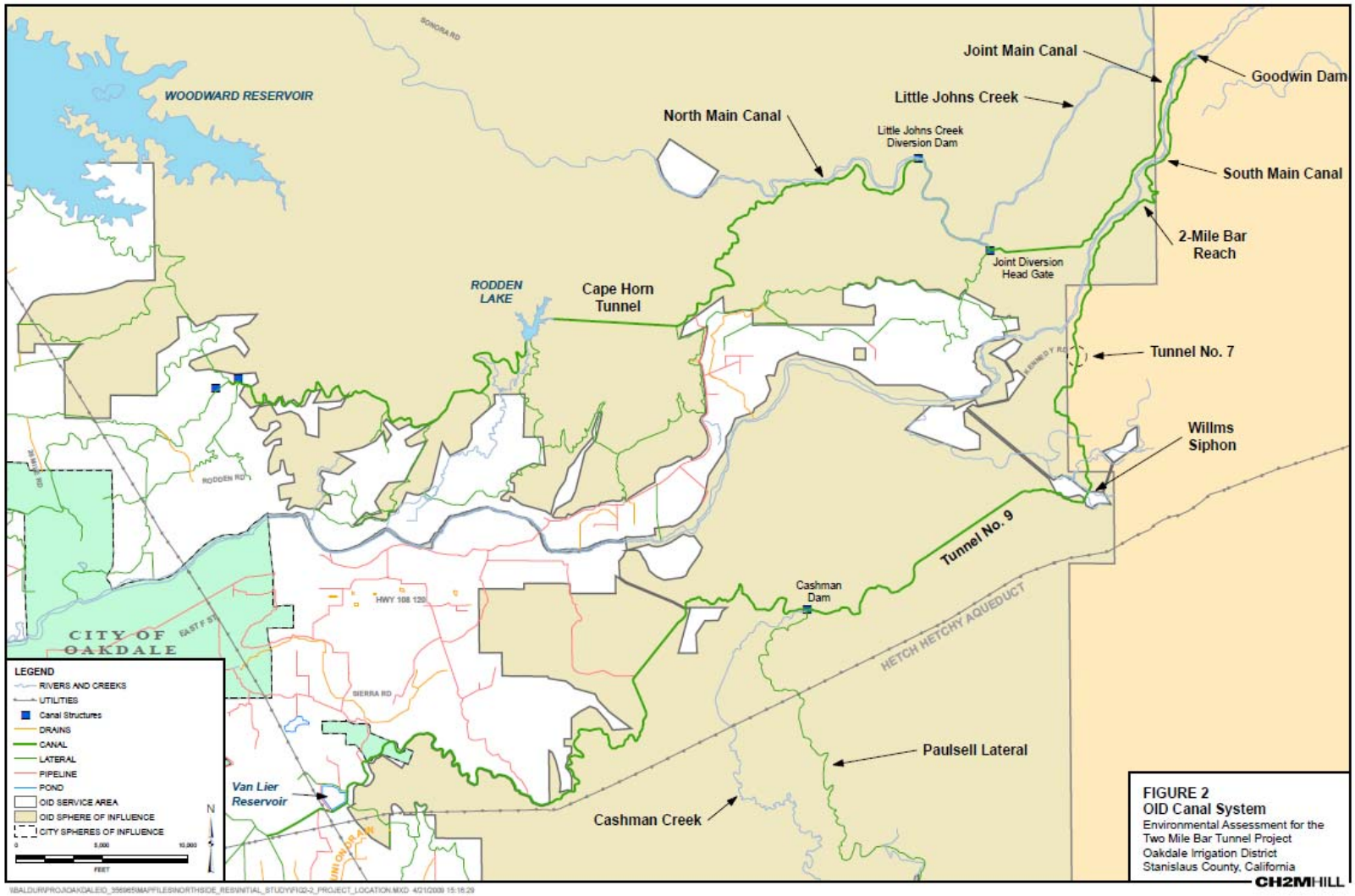

Figure 1-2 OID's Canal System and Two-Mile Bar Reach

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Based on variations in rock and soil type, the tunnel would be constructed between 100 to 200 feet below the ground surface for most of its length. OID would need to acquire access to Federal and private lands for construction and inspection and maintenance of the tunnel. The proposed tunnel has been re-designed to eliminate the need for ventilation shafts at the surface, thereby reducing and avoiding effects on surface areas above the new tunnel. Figure 1-3 shows the vicinity of the proposed action area including the up and downstream portal laydown/staging areas; and Figure 1-4 shows the upstream portal and laydown/staging areas in detail.

1.3 Location of the New OID Tunnel Area

As shown in Figure 1-3, the vicinity map, the proposed OID tunnel area lies within Stanislaus and Tuolumne counties, approximately 1 mile northeast of the town of Knights Ferry and 12 miles east of Oakdale, northwest of State Route (SR) 108/120. The coordinates are approximately 37° 50' 23.19" N, 121°38' 23.12" W; and 37° 49' 35.74" N, 120°39' 09.14" W, while the proposed tunnel passes through Sections 21, 22, and 28 of Township 1 South, Range 12 East. The proposed tunnel's upstream portal would be located near the Corps' Two-Mile Bar Recreation Area parking lot; and the downstream portal would be located approximately 5,900 feet downstream or downslope (southwest) from the upstream portal tying in back to the existing canal (Figure 1-5), off Corps property. The Two-Mile Bar Recreation Area also has day use facilities and the Two-Mile Bar Recreation Area Road provides public access to the Stanislaus River. Outside the recreation area on private land, the proposed upstream portal of the tunnel is characterized as undeveloped rocky non-native grassland with little soil development that is used primarily for grazing. As discussed in more detail in Section 3.5 of this EA, Vegetation and Wildlife Section, the downstream portal area on private land is characterized as undeveloped rangeland on bouldery volcanic rock with little soil development. Blue oak trees and non-native grasses and forbs are found at both portals. Appendix A consists of representative photographs of the habitat found in the proposed action area.

1.4 Need for Proposed Action

Approximately 60 percent (servicing an area of approximately 34,000 acres) of OID's constituents or the entire south side of OID service area would be affected because of rock overhangs and the use of dry-stacked rock on the downstream canal embankment during its original construction. Appendix A, Photograph 1 shows this segment of the South Main Canal being blocked or sectioned off. Historically, large boulders have fallen from the steep slopes above this area and destroyed sections of the canal, causing significant water losses and service interruptions. Each time this occurs, emergency measures must be implemented to restore the canal. The OID Water Resources Plan (WRP) (CH2M HILL, 2005) concurred with a geological investigation report (Condor Earth Technologies, 2003/4 and 2007) that identified this as a very-high-risk area for failure and recommended that a new tunnel be built around this particular section of the canal. The proposed tunnel would eliminate a significant portion of this risk once construction is completed and a section of the South Main Canal has been blocked or sectioned off. Due to routine damage from fallen rock into to the South Main Canal, it is necessary for OID to block or section off a section of it and construct the tunnel to save money from having OID to constantly repairing the canal and allow uninterrupted conveyance of water via the South Main Canal to downstream users.

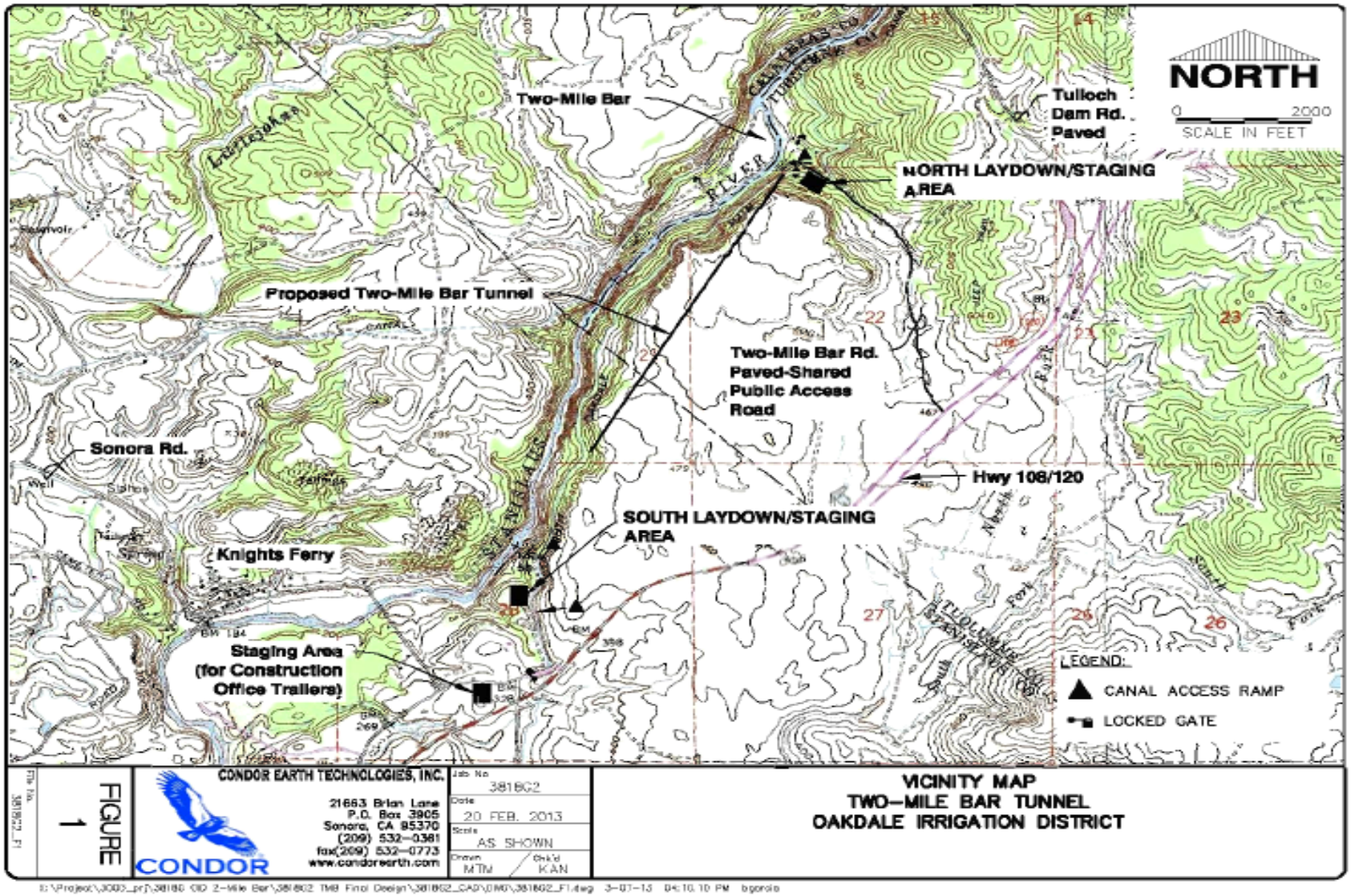

Figure 1-3. Vicinity Map of Two-Mile Bar Tunnel Alignment with Upstream and Downstream Portal of Tunnel and Staging/Laydown Areas

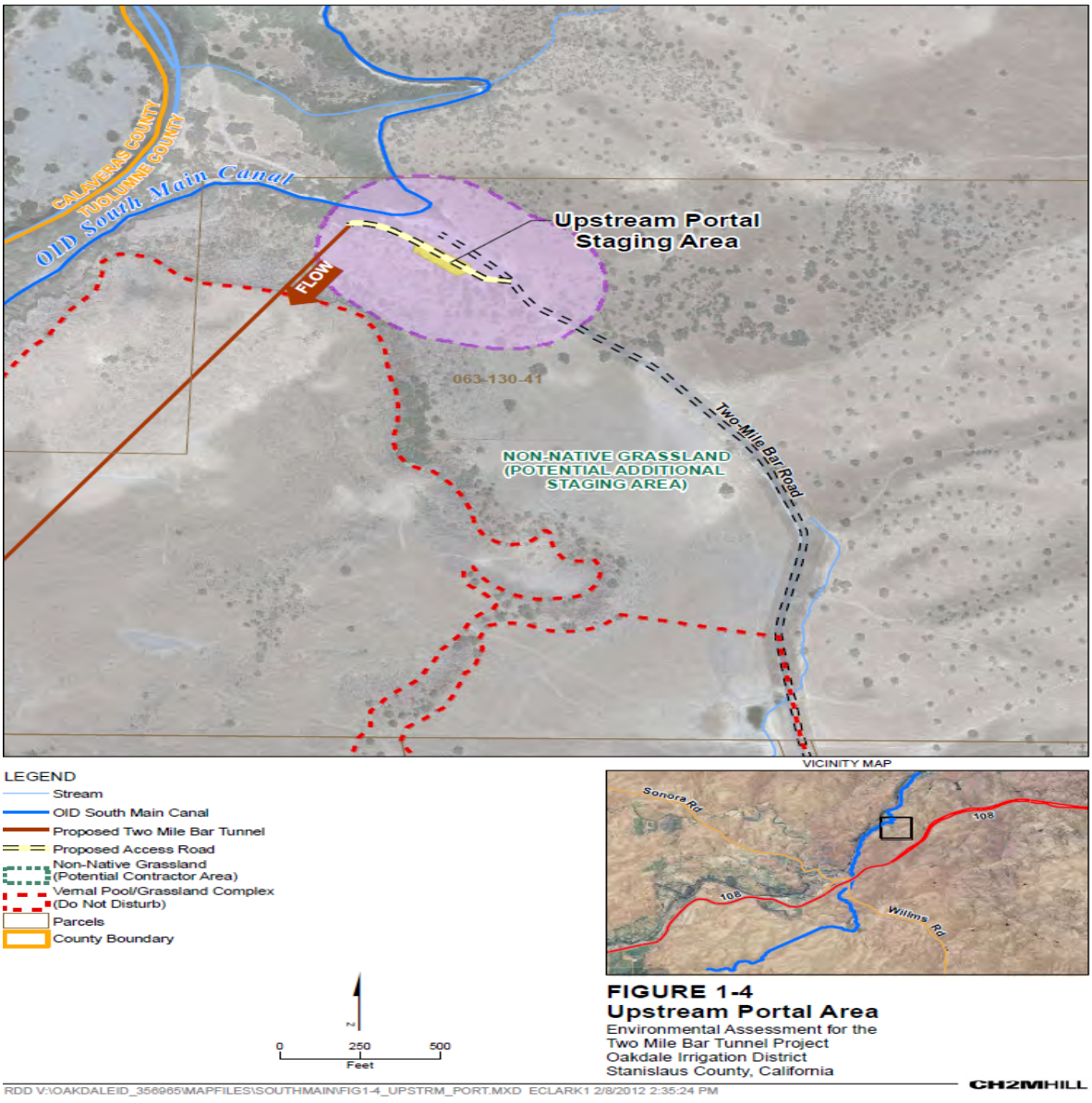

Figure 1-4. Upstream Portal Staging Area

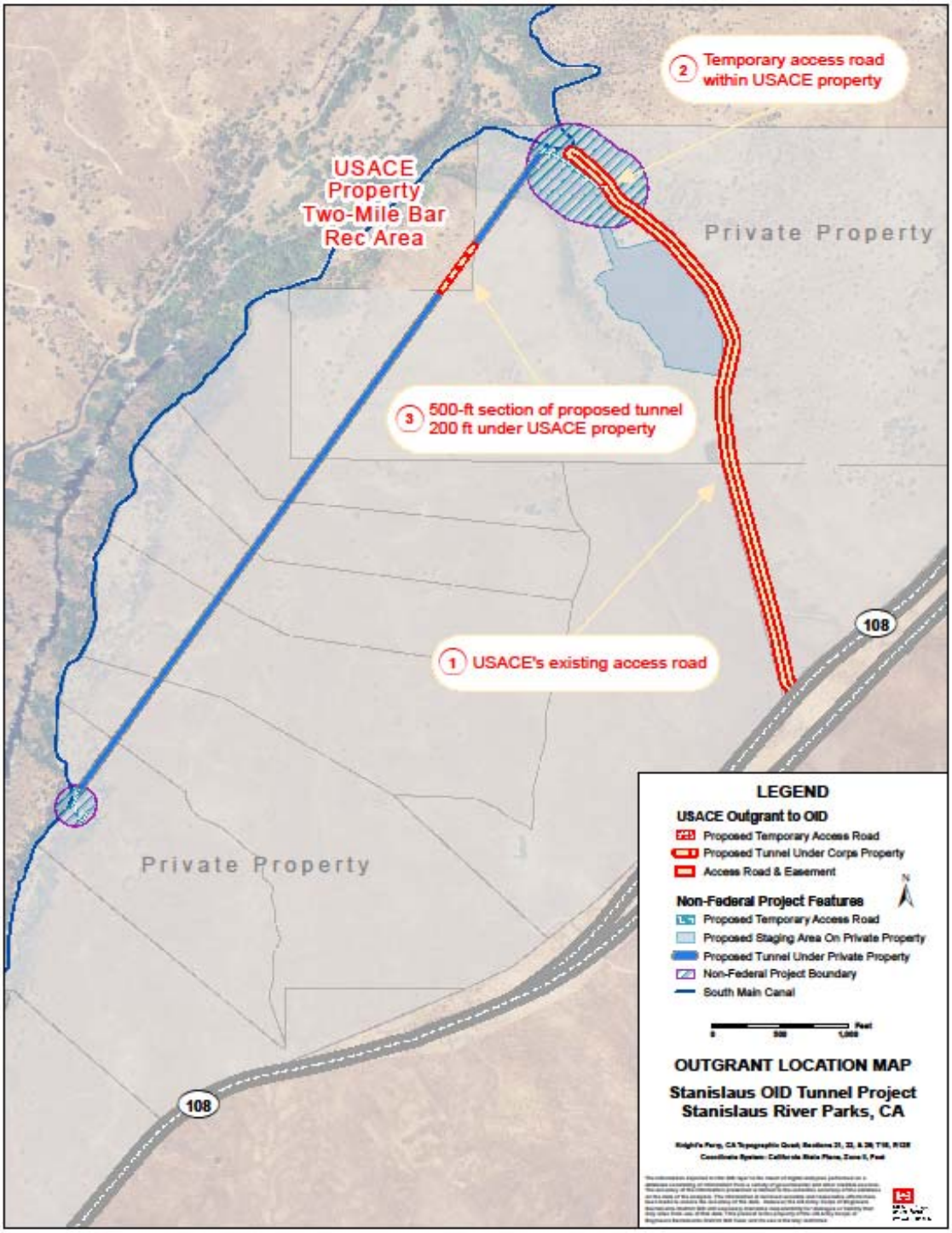

Figure 1-5. Corps Property and Extent of the Corps' Proposed Action: Two-mile Bar Recreation Area and the Two-Mile Bar Access Road

OID is a nonprofit, local public agency that operates as a political entity of the state of California under the California Water Code. In 1909, OID was organized under the Wright Act of 1887 by a majority of landowners in the district to legally acquire and construct irrigation facilities and distribute irrigation water from the Stanislaus River. In 1910, OID and the South San Joaquin Irrigation District purchased Stanislaus River water rights and some existing conveyance facilities from previous water companies. The districts continued to expand their facilities and infrastructure over the next several decades. In compliance with CEQA, the proposed Two-Mile Bar Tunnel Project was identified and evaluated in the OID WRP Programmatic Environmental Impact Report (CH2 MHILL, 2007) as one of several recommended infrastructure upgrades.

A section of the South Main Canal on private land remains a high-risk hazard and routinely subject to frequent damage because of potential rockfall from the slope above. OID is proposing to build a new tunnel and tie-ins with the canal that would address the potential damage to the canal by bypassing the highest risk area. Under the authorization of 10 USC §2668, the Corps could grant right-of way for OID to use Federal land.

1.5 Project Authorization

The Flood Control Act of 1944, Public Law 87-874, authorized the Corps to construct the New Melones Project on the Stanislaus River. Once completed, New Melones was transferred to the U.S. Bureau of Reclamation to be operated as part of the Central Valley Project (CVP). One of the CVP features constructed by OID was the South Main Canal, who currently operates and maintains the canal. Authorized by the Water Resources Development Act of 1996, Public Law 104-303, Section 208, the Corps later purchased land to maintain the 8,000 CFS channel capacity, for habitat easements, and for recreation. The Corps manages the Stanislaus River Parks, which is a series of recreation areas along the Stanislaus River that includes the Two-Mile Bar Recreation Area.

Some of the features of the proposed tunnel project would be located on Federal land managed by the Corps. These features on Federal land would include constructing approximately 500 linear feet of the tunnel passing underneath the surface of Federal land. OID and the contractor would use an existing paved (Two-Mile Bar Road) and gravel/dirt road leading into the Two-Mile Bar Recreation Area so construction vehicles and equipment could pass through to private land for access to the downstream and upstream portals and to the area used for laydown/staging equipment and materials. In addition, the existing paved Two-Mile Bar Road (Federally owned) would be used for access to the tunnel and South Main Canal work sites for periodic inspection and maintenance of the tunnel and tie-in diversions from the canal to the tunnel opening, and oak plantings. The Corps has the authority to grant "easements for rights-of-way over, in, and upon public lands permanently withdrawn or reserved for the use of that department, and other lands under the Secretary's [of the Army] control for canals and tunnels" (under 10 U.S.C. §2668). Army Regulation (AR) 405-80 "sets forth the authority and policies for management of … real property under the jurisdiction or control of the Department of the Army."

1.6 Purpose of the Environmental Assessment

A NEPA document is required for the issuance of a granting a right-of-way to OID for construction of a 500-section of the Two-Mile Bar Tunnel, located under the Corps' property at the Two-Mile Bar Recreation Area, and for use of the Two-Mile Bar access road to inspect and

maintain the tunnel, which is considered to be a Federal action. This draft EA discusses the existing environmental resources in the proposed action area, evaluates the No Action and preferred alternative in association with the potential direct, indirect, and cumulative effects resulting from the proposed action on these resources. Where applicable, the mitigation sections of this document outline the details on mitigation plantings and/or implementation of BMPs/ measures that OID would use to either avoid, minimize, and reduce the effect as compensation for the adverse effects to the resources. After the public review ends and all appropriate comments have been incorporated and adequately addressed, the Corps will conclude the NEPA process by issuing a final EA and Finding of No Significant Impact, if deemed appropriate.

2.0 ALTERNATIVES

2.1 No Action

Under the No Action alternative, the proposed tunnel would not be constructed and OID would continue to use the high-risk section of the existing South Main Canal subject to damage from fallen rock that is located between the Two-Mile Bar Recreation Area and SR 108/120, which provides irrigation water to the southern portion of the OID service area. The existing environmental conditions would not be affected, and the need for the proposed action would continue. Past incidents of canal failure in this area have demonstrated that the entire local water infrastructure system that downstream water users depend upon would continue to be at risk of needing repair under the No Action alternative.

2.2 Two-Mile Bar Tunnel (Preferred Alternative)

The proposed action is for the Corps is to grant OID right-of way permission to access Federal land. As mentioned earlier, granting OID a right-of-way is needed so they could: (1) construct a 500 foot section of tunnel under Corps property and (2) to use the Two-Mile Bar Recreation Area road to access the tunnel in order to perform routine operation and maintenance actions associate with the tunnel. Since approximately 500 linear feet of the new tunnel crosses the Two-Mile Bar Recreation Area that is on Federal land under the jurisdiction and management of the Corps, OID is required to obtain right-of-way from the Corps to use Federal land for its construction, access, tunnel maintenance, and to perform any maintenance of associated mitigation plantings to compensate for the effects associated with constructing the new tunnel. The right-of-way permission would include a 100-foot wide construction easement and use of access roads leading to and across Federal land including the canal located adjacent to the Two-Mile Bar Recreation Area.

The project has been designed for continuous conveyance of OID irrigation water. The new tunnel would bypass and eliminate a high-hazard area of the South Main Canal. This canal is currently threatened with frequent damage from falling boulders and rocks. Off Two-Mile Bar Road on private lands, the upstream portal of the OID tunnel begins near the Two-Mile Bar Recreation Area parking lot and the downstream portal of the tunnel ends where it re-surfaces and reconnects to the existing canal approximately 5,900 feet downstream, also on private property. The proposed Two-Mile Bar Tunnel would be circular measuring 11.5 feet wide at the bottom and 13 feet high in the center. Due to various layers of soil and rock that could require

underground blasting, the tunnel would be constructed between 100 to 200 feet below the ground surface for most of its length and shotcrete lined.

Note: In the Final July 2010 Initial Study and Mitigated Negative Declaration prepared for OID for the entire length of tunnel, a portion of the tunnel spoils were to be used to fill in the old canal section. The sides of the canal would have been demolished and folded into the canal along with this fill to create a level grade. However, to minimize and avoid the potential for erosion and effects on nearby elderberry shrubs, the description of the proposed action was revised. All tunnel spoils would now be disposed of at the nearest licensed facility and the old canal section would not be backfilled. The old canal segment would then be blocked or sectioned off in selected areas based on the natural topography such that the natural drainage pattern would be restored and so that water would not accumulate or be transported in the old canal. In addition, the downstream staging areas have been moved to two new locations further south away from vernal pools/seasonal wetlands as discussed and illustrated later in this EA. These staging areas are not part of the Corps' action, but rather are included to provide background information.

2.3 Construction Details

Tunnel Description

The tunnel plan, profile, and cross-section are shown in Figure 2-1. In the area that is located approximately 800 feet south of the upstream portal of the new tunnel, approximately 500 linear of the tunnel would pass underneath the surface of Federal land managed by the Corps (Figure 2-2) with the remaining 5,400 feet passing through private land. The new tunnel would be an 11.5-foot wide by 13-foot high circular tunnel with a 6-inch flat invert concrete slab to allow access for inspection and maintenance during the non-irrigation season. The entire tunnel would be lined with 4 inches of fiber reinforced shotcrete. This design allows for open flow of the diverted water so that no vents or vent shafts would be needed along the tunnel alignment. Throughout its entire length of 5,900 feet, the Two-Mile Bar Tunnel would be constructed between 100 to 200 feet below the ground surface and it is aligned to be a straight tunnel with no angle points between the upstream and downstream portals. There would be a 100-foot wide easement for construction of the tunnel that would extend 50 feet to each side from the centerline of the tunnel alignment. On private land, the upstream portal of the tunnel would tie into the existing canal wall and an earth/concrete berm would be placed in the existing canal to divert water flow into the new tunnel. On private land, the tunnel would re-connect with another tie-in to the South Main Canal via a portal-canal transition similar to the connection used for the upstream portal.

Subsurface Conditions

A detailed exploration program was conducted by OID to define anticipated subsurface conditions along the tunnel alignment. Anticipated subsurface conditions are illustrated in Figure 2-3, Geologic Profile. It is anticipated that near the upstream portal there would be 4 to 6 feet of colluviums over tertiary age Mehrten Formation (soft rock). The Mehrten Formation is expected to be present at the tunnel entrance and would be the predominant geologic unit along the tunnel alignment (approximately 90 percent). Mehrten Formation consists of sedimentary and volcaniclastic rocks that are generally massive and thick to very thickly bedded. Near the downstream portal and possibly in other portions of the tunnel, Jurassic age Gopher Ridge Formation metamorphic rock is anticipated to be present and underlying 4 to 6 feet of

colluviums. The Gopher Ridge Formation is hard to very hard, strong, and locally blocky and it is anticipated to be moderately weathered to fresh (hard rock).

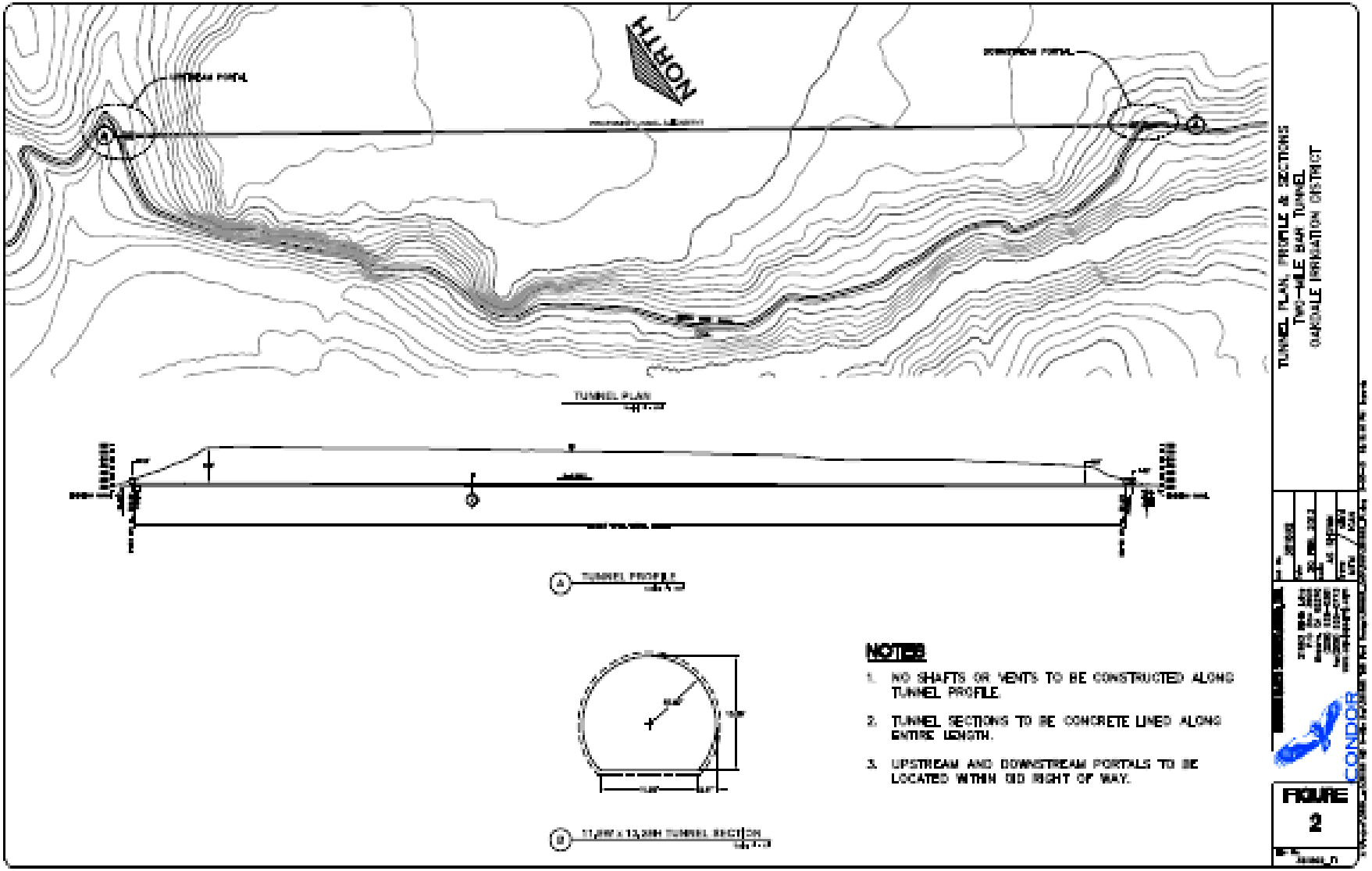

Figure 2-1. Two-Mile Bar Tunnel Plan, Profile, and Cross-section.

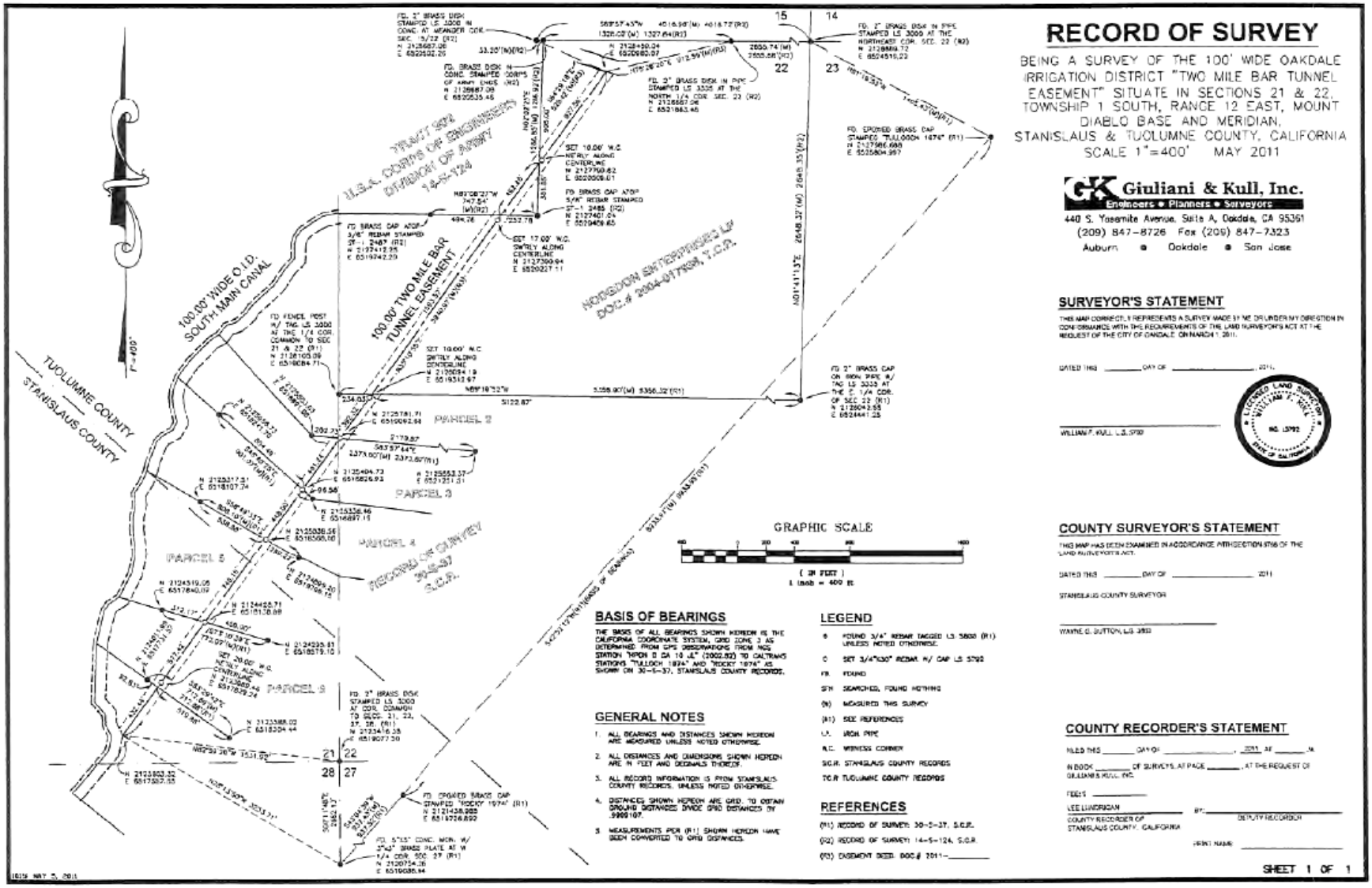

Figure 2-2. Portion of the Proposed Two-Mile Bar Tunnel Passing Underground Through Federal land [Tract 902 (14-S- 124)] at the Two-Mile Bar Recreation Area Requiring Right-of-Way Permission From the Corps.

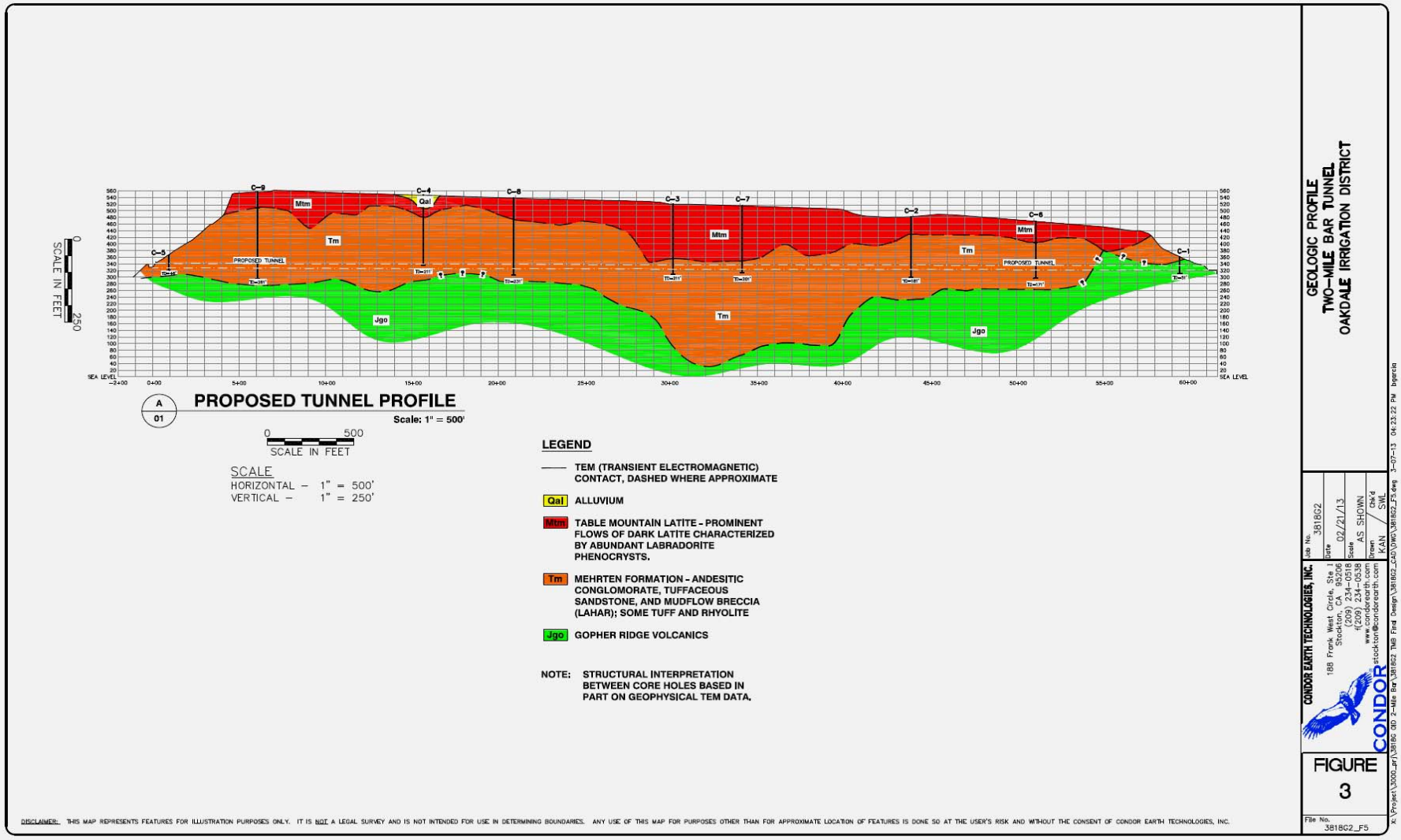

Figure 2-3. Geologic Profile of the Two-Mile Bar Tunnel Project

Construction Method and Techniques

Construction would commence at the upstream portal, off Corps property, where the excavated ground would be permanently supported by ground anchors and concrete. The portal would extend approximately 20 feet above the tunnel crown and would tie into the existing canal wall and new earthen berm upon completion of tunnel excavation. The tunnel would be excavated primarily in one direction from the upstream end and would take approximately 18 to 24 months to complete, assuming one shift per day. Limited tunnel excavation downstream portal construction could occur from the downstream end, access via the existing canal during the non-irrigation season (November – February). An additional excavator and one or two haul trucks could be used if there is difficulty in removing material while using one excavator. The change to the effect of using two excavators and one or two haul trucks carrying the material rather than one excavator or one or two trucks being used is small and insignificant.

Based upon the anticipated ground conditions described above under subsurface conditions, it is anticipated that the tunnel would be excavated using mechanical excavation methods such as roadheaders or milling head/impact hammers mounted on a small excavator or electric mining equipment. It is anticipated that electric mining equipment would likely be the preference of the contractor for most of the tunneling based upon anticipated ground conditions and the tunnel length. Some areas of the Gopher Ridge volcaniclastic rock could require localized blasting in the tunnel by the tunnel contractor. Considering this type of blasting is well below the surface of the ground and confined to the tunnel area, there would be no surface disturbance, and the noise and vibration associated with the blasting would be less than background noise from surface construction activities.

Spoils removal from the tunnel is anticipated to be performed by rubber-tired mining equipment, mining rail cars, or some combination per the contractor's preference. The spoils would be transferred to highway dump trucks at the spoil transfer area and remove from the site to a local commercial area (see Figure 2-4 for spoils transfer area). Some spoils could be similarly removed at the southern staging area if the contractor chooses to advance the tunnel from the south as described above.

Tunnel excavation would most likely be scheduled for one 10-hour shift per day, five days per week. Saturday would be a work make-up day, if needed. The concrete invert pour to line the tunnel interior for stabilization could occur on Fridays. The concrete invert pour would need to be done weekly in areas where drilling is in unconsolidated rock. In hard rock areas, tunnel-lining concrete work would not be done weekly, and the time could be extended. For each concrete pour, approximately three concrete trucks would be used. This work schedule is anticipated to generate approximately 20 to 100 cubic yards of tunnel muck/soil/rock each excavating day, depending on the geological conditions. The tunnel excavation would start in May/June 2015 and anticipated to be completed in approximately 18 to 24 months, depending upon the tunnel construction methods used. Construction equipment that could be used, but not limited to, that emit emissions include excavator or drill rig, ore car - electric, tunnel excavation equipment and conveyor ore loading car - electric, tunnel ventilation equipment, construction worker vehicles backhoe, dozers, front loader, scraper, haul, fuel, dump, and water trucks, cement trucks, and gas/diesel generators.

2.4 Construction Access Routes and Laydown/Staging Areas

Access routes and staging areas for the overall construction have been designated so it would have the least possible affect on traffic and environmentally sensitive areas. Numerous routing alternatives were considered to avoid effects on vernal pools or potential endangered species habitats. The number of potential laydown/staging areas would be kept to a minimum and located in disturbed areas with non-native vegetation or no vegetation to reduce or avoid potential significant effects on the environment. OID's request for a right-of-way to use the Corps' existing Two-Mile Bar Recreation Area road will minimize impacts that may otherwise occur with construction of a new access road.

Upstream Portal Access. Access to the upstream portal (point of ingress) (Figure 2-4) would be via the existing Two-Mile Bar Road. This road is a cul-de-sac that ends in a parking lot that is managed by the Corps at Stanislaus River Parks. The park system includes several day-use facilities and a road that provides public access to the river. Public access leading into the Two-Mile Bar Recreation Area would not be closed (unless directed by the Corps) or disturbed during construction.

As the location is shown in Figures 2- 4 and 2-5, the construction contractor would create a temporary access and laydown/staging/spoils transfer area near the upstream and downstream portals and placed onto disturbed areas with non-native grasses or no vegetation on private property. The upstream portal area is adjacent to the existing parking lot where trucks, equipment, and materials would be staged with a cleaning area. Use of these areas on private land for construction would require a temporary construction easement from the landowners. The existing paved road would only be used to travel to and from SR 108/120. The contractor would keep the existing roads clean of debris and maintain the roads in good condition throughout the proposed action. After completion of the proposed action issuing OID right-of-way access to construct the 500 foot section of tunnel under the Corps property, the Two-Mile Bar Road and secondary access roads would be repaired to its original condition, if necessary.

Downstream Portal Access. The downstream portal (point of egress) of the tunnel (Figure 2-4), is located on private land and not part of the Corps' right-of-way to OID. An additional laydown/staging area and second staging area for temporary construction office trailers is located on disturbed private land and would be available for use in the south of the proposed project near the intersection of the South Main Canal and Highway 108/120.

2.4.1 Spoil Pile Management

Soil, rock, and tunnel muck would be disposed of at the nearest licensed facility. Approximately 20 to 100 cubic yards of soil, rock, and tunnel muck would be generated each day. Up to three haul trucks would be used to transport the tunnel muck from the spoil pile transfer area (Figure 2-4) to the nearest licensed facility, approximately 4 miles to the west. Over the 18 month construction period to excavate the tunnel, as shown in Table 2-1, it is estimated that hauling materials would take approximately 6,170 hours or 2.1 truck trips/day. One haul truck would be in transit, one would be in the process of being loaded, and one would be waiting to be loaded. Hauling of the excavated materials would be intermittent and not continuous throughout the

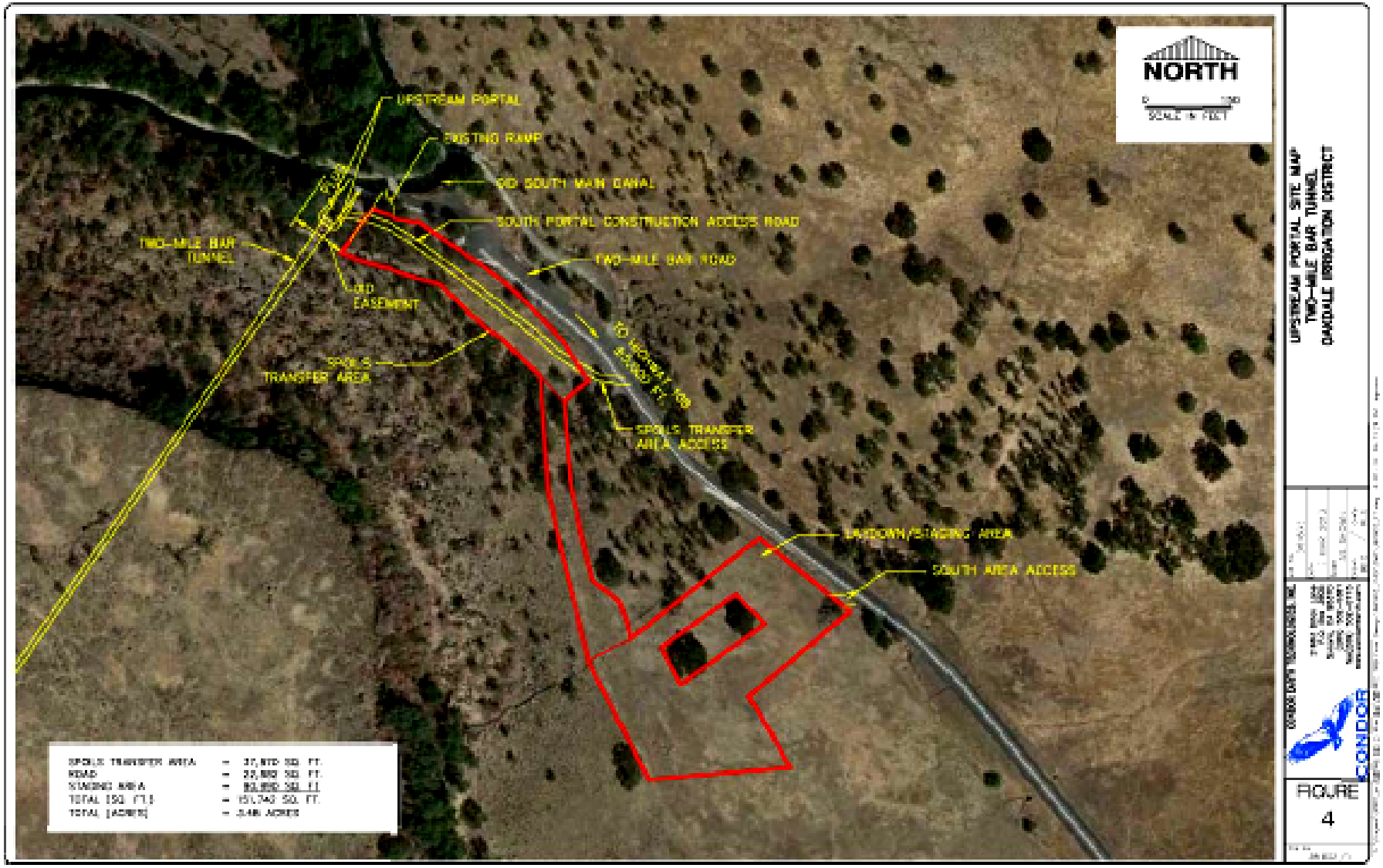

Figure 2-4. Aerial View of Location and Details of Alignment of Upstream Portal and Tunnel Connection to South Main Canal, Staging Area, Spoils Transfer Area, and Construction Access.

entire day due to the wait time needed to excavate enough materials out of the tunnel to put into spoil piles and then transferring it into the haul trucks.

2.4.2 Construction Schedule

The following construction schedule for the proposed Two-Mile Bar Tunnel is summarized in Table 2-1:

Table 2-1 Construction Schedule

	For the July 2010 Final Initial Study/Negative Declaration, a technical memorandum summarizing the results of the rare plant survey were submitted to the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW).
Summer 2014	The Corps initiates and completes Section 106 consultation with SHPO and consultation with the Tribe(s). The Corps initiates and completes Section 7 consultation with the USFWS.
Spring 2015	OID begins new tunnel excavation. Construction would start in May/June and continues up to approximately two years. Implementation of construction and environmental best management practices (BMPs).
Winter/Spring 2017	Blocking or sectioning off the existing canal and installing diversion tie-ins from the canal to the upstream portal of the new tunnel and from the downstream portal to the canal would take place from January to March of the second year of construction. Begin mitigation plantings in the Spring or Fall and conduct maintenance and monitoring activities for ensuring planting success.

Figure 2-5. Aerial View of Downstream Portal of Tunnel and Details of Canal Re-connection Tie-in.

3.0 AFFECTED RESOURCES and ENVIRONMENTAL EFFECTS

This section describes the physical, biological, social, and economic resources in the proposed action area and the potential environmental effects of the No Action and Proposed Action alternatives. The majority of the effects analysis presented in this EA pertains to construction activities on private land, which were previously disclosed in OID's July 2010 EIR and included mitigation. OID would implement the mitigation plantings and Best Management Practices (BMPs)/measures to compensate for the short term effects resulting from constructing the tunnel. In compliance with NEPA, disclosure of the effects pertaining to what would occur on the Corps' property when it issues a right-of way to OID for construction of the tunnel are also included in this EA and includes conditions to ensure OID implements BMPs to compensate for the effects. As appropriate, the design, timing of construction, mitigation plantings, and use of BMPs/measures are proposed as mitigation for OID to avoid, minimize, and/or reduce the adverse effects to the environmental resources.

3.1 Resources Not Considered In Detail

Initial evaluation of the potential effects of the alternatives indicated that there would not be any adverse direct, indirect, or cumulative effects on several resources because of the scale, scope, and schedule of the proposed action. These resources are discussed briefly in Sections 3.1.1 through 3.1.7 to add to the overall understanding of the environmental setting.

3.1.1 Land Use

Land use classifications characterize the natural and human activities that occur at, or are planned for, a given location. Natural land uses include open grassland, forest, open water, and other undeveloped areas. Developed land uses are generally classified as residential, commercial, industrial, airfield, and other types of development. Comprehensive plans, policies, and zoning regulate the type and extent of land uses allowable in specific areas and often protect environmentally sensitive resources. Land use effects typically result from actions that negatively affect or displace an existing use, or the suitability of an area for its current, designated, or formally planned use.

The primary land uses in the construction area for the upstream portal are open space near the Two- Mile Bar Recreation Area, which a road provides recreational access to the Stanislaus River Parks and access to livestock grazing on private lands. The Two-Mile Bar Recreation Area is accessed from the parking area located at the terminus of the road. The Two-Mile Bar Road is southeast of the construction area and passes through grazing land for approximately 1 mile before it intersects with SR 108/120. The proposed action area is surrounded primarily by existing oak woodland/ grassland (non-native). The proposed action area and adjacent lands are situated on land that is zoned A-2-40 (General Agriculture) in Stanislaus County (Stanislaus County, 2010a), and A10/AE-37-AP (Exclusive Agriculture) in Tuolumne County (Tuolumne County, 2012).

The proposed action is to grant OID right-of-way permission to use Federal land. Use of Two-Mile Bar as access is necessary so OID can construct a 500 foot section of tunnel under Federal land (Two-Mile Bar Recreation Area) managed by the Corps. Allowing OID access would not affect land use designated as open space on Federal land. In addition, it would not affect land use on private land at the canal or tunnel alignment except in the immediate area of the upstream

and downstream portals of the tunnel. Except for a small localized area around the fenced tunnel portals, livestock grazing could continue at the discretion of the private land owner. In addition, the proposed action would not conflict with the existing zoning of associated parcels. According to the California Department of Conservation (DOC) Farmland Mapping and Monitoring Program, the proposed action is located in two areas that are undesignated, and one area designated as open space. No existing farmland found lower in elevation would be permanently taken out of production as a result of the proposed action.

Utilities

In addition, there are no known utilities found within the construction footprint that could be affected, since the project area is designated as open space. Because of the scale, scope, location, and temporary duration of the work, there is no likelihood that the proposed action would have a direct, indirect, and cumulative effect on land uses in the area.

3.1.2 Geology and Seismology

Geologic resources consist of the earth's surface and subsurface materials. Seismology considers the geophysical science of earthquakes and the mechanical properties of the earth.

Geology. The proposed action is located along the border of Stanislaus and Tuolumne Counties in the western area of the Sierra Nevada Geomorphic Province. This region is characterized by the Sierra Nevada Mountains, a block-faulted granitic batholith extending from the Mojave desert to north of Lake Tahoe (Miller and Paterson, 1991). Geologic formations in the region consist of alluvial fan deposits of fine sands and silts. Near-surface sediments are primarily floodplain deposits from the Stanislaus River; in some locations, continental sediments formed 25,000 to 13 million years ago are exposed at the surface (Clark, 1960). The existing South Main Canal sits on tertiary volcanic rock. The proposed action would traverse areas of basalt, hard rock, cobble stones, volcanic rock, sand, and silt.

Seismology. Tectonically, the Sierra Nevada Mountains have been tilted westward by rapid uplift along the Sierra Nevada Fault Zone. The Sierra Nevada Fault Zone forms the eastern escarpment and gentle west-sloping foothills, terminating along the west boundary by the Foothills Fault Zone, the southwestern reaches of which are located approximately 5 miles northeast of the proposed action. Most seismic activity along the Foothills Fault Zone is relatively infrequent with low related ground motions, making the activity relatively minor when compared to other portions of California (Berry, 1993).

The Bear Mountains Fault and Melones Fault are part of the westernmost strand of the Foothills Fault Zone, with the closest proximity to the Proposed Action area. The Bear Mountains Fault is 186 miles long, and the Melones Fault is 199 miles long; both are characterized as Late Quaternary fault zones. Slip rate values (the displacement divided by the period of movement) have been estimated at approximately 0.05 millimeter per year for the Foothills Fault System (DOC, 2007).

The seismicity of a region is described by the distribution, recurrence, and intensity of ground shaking associated with earthquakes over a period of time. All of California is within Seismic Zone 3 and 4; while Zone 4 is nearest to active earthquake faults and poses greater hazards than Zone 3. The proposed action area is considered to be in the area of lower seismicity, Zone 3

(California Seismic Safety Commission, 2005). In addition, no Alquist-Priolo Special Studies Zones are with the proposed action area. Such zones highlight active earthquake faults that have a potential for ground-surface rupture (DOC, 2010).

Topography. Topography refers to an area's surface features including shape, height, and depth. Topography within the proposed action area is commonly associated with the soil development on alluvial terraces and moderately old fans, and is usually considered gently undulating. The segment of the South Main Canal at Two-Mile Bar Recreation Area is located in the Lower Stanislaus River watershed at an elevation of approximately 500 feet. The topography of the construction laydown/staging areas ranges from relatively flat to gently sloping.

3.1.3 Climate, Climate Change, and Greenhouse Gas

Climate. The average annual temperature for the city of Modesto (approximately 20 miles southwest of the proposed action area) ranges from highs of 95 degrees Fahrenheit (°F) and lows of 65°F in the summer to highs of 55°F and lows of 40°F in the winter. The record summer highs are up to 110°F and record winter lows are down to 20°F (Weather Underground, 2012). There is an average of 13 inches of precipitation per year, mainly in the form of rain, but with some hail or snow from the occasional extreme winter storm (National Oceanic and Atmospheric Administration, 2012).

Climate Change. The State of California mandated reductions of greenhouse emissions through legislation. These mandates include Assembly Bill (AB) 1493, Executive Order S-3-05, AB 32, and Senate Bill 1368. AB 1493 requires that the California Air Resources Board (CARB) develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty truck and other vehicles determined by CARB to be vehicles whose primary use is noncommercial personal transportation in the state." Executive Order S-3-05 proclaims that California is vulnerable to the effects of climate change. To combat those concerns, the Executive Order established total greenhouse gas emission targets. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80 percent below the 1990 level by 2050. AB 32 requires that statewide greenhouse gas emissions be reduced to 1990 levels by 2020. CARB determined the statewide 2020 emissions limit to be 427 million metric tons carbon dioxide equivalent.

Greenhouse Gas. The proposed action is to grant OID right-of-way access so it could implement tunnel construction activities, which would include some activities that emit greenhouse gases such as the use of an excavator, front end loaders, dump and cement trucks, personal vehicles, and generators during construction. However, the construction greenhouse gas emissions would be short-term and minor compared to the 2020 emission limit of 427 million metric tons carbon dioxide equivalent. The total greenhouse gas emission for nitrogen oxide is estimated to be 7.60 tons/year, 0.77 ton/year for reactive organic gas, and 0.30 ton/year for particulate matter. Therefore, the proposed action's minor construction greenhouse gas emissions would not interfere with CARB's long-term goal to reduce greenhouse gas emissions to 1990 levels by 2020. Because of the scale and scope of the work, there is little likelihood that the proposed action would have a significant direct, indirect, and cumulative effect on regional climate and greenhouse gas.

3.1.4 Socioeconomics and Environmental Justice

Socioeconomic resources are defined as the basic attributes associated with the human environment, particularly population and economic activity. Population is described as the magnitude, characteristics, and distribution of people. Economic activity is described in terms of employment distribution, personal income, and business growth.

Oakdale (population 20,497) is located about 12 miles southwest of the downstream portal of the proposed Two-Mile Bar Tunnel. In 2010, the ethnic makeup of the town was 74.8 percent White, 20.4 percent Hispanic or Latino, 0.4 percent African American, 2.5 percent Asian, 0.2 percent Pacific Islander, 1.3 percent from other ethnicities, and 0.4 percent from two or more ethnicities (Census, 2010). According to the 2010 Census, the median per capita income in the town is $21,742, and the median household income is $53,628. The most common industries are manufacturing for working male residents and health care for working female residents. About 8.2 percent of the population is below the poverty line (Census, 2010).

The proposed issuance of granting OID right-of-way to access the Two-Mile Bar Road and construct the tunnel would not have any direct, indirect, and cumulative effect on the socioeconomics of the area because it would not limit current or future opportunities for agriculture, business, employment, or housing opportunities. In addition, the proposed action would not result in direct, indirect, and cumulative effects to employment for minorities or low-income populations. Construction could result in short term beneficial effects by providing temporary work opportunities for minorities or low-income populations.

3.1.5 Soils, Prime Farmland, and Unique Farmland

Soils are the unconsolidated surface materials that form from underlying bedrock or other parent material. Soil drainage, texture, strength, shrink/swell potential, and rates of erosion affect the suitability of the ground to support manmade structures and facilities. Prime farmland is land that is of major importance in meeting the nation's short- and long-range needs for food and fiber. Prime farmland has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops.

Prime and Unique Farmland. Private lands in and near the proposed action area are zoned as open space, but used for grazing. However, the existing land uses are nonagricultural. The portion of the proposed action area located in Tuolumne County does not have an agricultural importance designation, as defined by the DOC Farmland Mapping and Monitoring Program. The portion of the proposed action area located in Stanislaus County is defined as grazing land (DOC, 2006).

Soils. Soil types within OID vary significantly relative to their proximity to the Stanislaus River. Soils along the river have been developed from alluvial deposits that create terraces and fans. Older alluvial terraces stretch out from both sides of the river. Soils vary from deep (greater than 10 feet) loams and clay loams close to the river, to shallower, coarser textured soils in the higher elevations of OID that begin the transition to the Sierra Nevada Mountain foothills. The Natural Resources Conservation Service (NRCS) Web Soil Survey (NRCS, 2009) indicates that the soil

types at and surrounding the proposed downstream portal location and construction area consist of lava and Schist rockland (NRCS, 2009). NRCS Web Soil Survey data is not available for the upstream portal location.

The primary purpose of the proposed action is to improve/maintain water supply reliability for downstream users and agricultural lands by decommissioning the existing South Main Canal subject to periodic damages from fallen rock and replacing it with a bypass tunnel. Due to the timing of breaching and decommissioning the canal and design where water would be diverted into the new tunnel and tied back into the South Main Canal once tunnel construction is completed, would allow for uninterrupted conveyance of irrigation water to downstream users. Subsequently, the proposed action has been designed so it would have no direct, indirect, or cumulative effect on prime or unique farmland reliant on this water supply or its soils found lower in the valley.

3.2 Resources Considered in Detail

The adverse direct and indirect effects to the following environmental resources are discussed in detail below.

3.2.1. Aesthetics

3.2.1.1 Existing Conditions

Aesthetic resources are those natural resources, landforms, vegetation, and engineered structures in the regional and local environment that generate visual reactions and evaluations by viewers. In undeveloped areas, landforms, water surfaces, and vegetation are the primary components that characterize the landscape. In non-urban contexts, laws, such as the National Wild and Scenic Rivers Act, and management objectives protect the scenic quality of some special areas. Federal land managers also clarify the scenic value of lands in accordance with Federal land management regulations. An alternative would be considered to have an adverse effect on visual resources if transformation of the landform, vegetation, or structural features substantially degrades existing esthetic values.

The natural landscape of the area around the existing South Main Canal, Two-mile Bar Recreation Area, and the Two-Mile Bar Road is dominated by views of the surrounding vegetated hills, cliffs and the Stanislaus River. Local views in the vicinity of the proposed action area consist primarily of the existing parking area, oak woodland, grassland, and vernal pools. However, the area is not considered a unique scenic resource and likely viewers would be extremely limited (Stanislaus County 1994; State of California, 2005).

3.2.1.2 Effects

Basis of Significance. Effects on vegetation providing aesthetic values would be significant if the alternative results in the following:

- Substantial loss, degradation, or fragmentation of any natural vegetation communities or wildlife habitat

- Interference with the movement of any resident or migratory wildlife species

No Action. This alternative would not have any adverse effects on existing aesthetics in the proposed action area. Current aesthetic sources and levels would be expected to remain the same.

Proposed Action. Based on the design that avoids the effect, there are no effects to engineered structures. However, there are short term adverse effects to landform and vegetation on a local basis. As described in more detail under the Vegetation and Wildlife section during construction, vehicles and associated construction equipment would be visible; however, when complete, the proposed action would cause localized disturbance to the landform at the tunnel portals and South Main Canal construction sites where the canal is diverted to tie-ins to the portals and becomes blocked or sectioned off. Much of the terrestrial habitat found within the proposed construction staging areas and construction access has already been degraded through the previous development of the South Main Canal, the recreational area parking lot, and access roads. Because of the scale and scope of the work is limited to a small, localized area and proposed mitigation for OID to replace the affected blue oak/woodland/ grassland habitat, the proposed action is unlikely to result in significant direct, indirect, and cumulative effects on any public viewshed or existing aesthetic value. On private land, a total of 4.3 acres of associated oak woodland/non-native grassland would be affected.

Indirect Effects

After the tunnel is constructed, foot or vehicle traffic during the plant establishment, maintenance, and monitoring activities could result in potential indirect effects to vegetation. The effect would be temporary and avoided or reduced to less than significant with the implementation of BMPs such as installing vegetative fencing around nearby oak trees found growing at the portals and on the west side of the South Main Canal and vernal pools.

3.2.1.3 Mitigation

As described in more detail in the Vegetation and Wildlife Section, construction of the proposed action involves permanent surface ground disturbances at the South Main Canal (no riparian or oak vegetation disturbed) and upstream tunnel portals and terrestrial habitat totaling approximately 0.1 acre of a younger stand of blue oak woodland and 4.20 acres of associated non-native grasses. At the two portal locations, the permanent loss of 15 to 16 blue oaks on private land covering an area of 0.10 acre of blue oak woodland habitat would not result in a significant loss, degradation, or fragmentation of a vegetation community.

The following mitigation and BMPs would be implemented by OID to reduce the effects to aesthetics to less than significant. Effects on vegetation would be minimized by limiting the construction footprint and staging areas to the smallest size possible. Once construction of the tunnel is completed in the disturbed area for the upstream portal staging/laydown, OID would replant and maintain blue oak trees at a 3:1 ratio (45-48 trees) and seed native grasses over 4.2 acres in a cooperative agreement with the private landowner, as necessary. During the plant establishment period, the contractor would decide the appropriate irrigation method to use depending on whether or not it is feasible to use water from the South Main Canal. There is no nearby water source with enough head that could be used at the downstream portal. Once the staging and access roads are no longer used, the disturbed area would be re-seeded with native

grasses and planted with blue oak seedlings to compensate for the direct and indirect effects to wildlife. Weed control would be implemented throughout the 3-year plant establishment period. To compensate for potential indirect effects, vegetative fencing would be installed around nearby oak trees and vernal pools and riparian vegetation found growing on the west side of the South Main Canal to protect them from canal tie-in work, foot or vehicle traffic during the plant establishment, maintenance, and monitoring activities if these sensitive habitats are close enough to construction.

3.2.2 Recreation

3.2.2.1 Existing Conditions

There are numerous recreational opportunities around the nearby Stanislaus River Park system, including fishing, hiking, white-water rafting, and gold panning. A portion of the Corps' property at the Two-Mile Bar Recreational Area lies within the project area and its day use facilities borders the construction area on the north (Figure 3-1). Accessed through an entry station off Two-Mile Bar Road, which the road is also owned by the Corps in fee title (previously shown in Figure 1-5), the day use facilities are open year round with peak visitation from May to September. Visitors to the Two-Mile Bar Recreation Area tend to congregate along the Stanislaus River shoreline approximately 800 feet northwest of the construction area.

3.2.2.2 Effects

Basis of Significance. Effects on recreation would be considered significant if the proposed action would close recreational facilities, restrict or otherwise change recreational activities in the area, or 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.

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Figure 3-1 Corps Property - Two-Mile Bar Recreation Area and its Facility Features

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No Action. This alternative would not have any adverse effects on existing recreational facilities and use in the proposed action area. Current recreational facilities and use would be expected to remain the same.

Proposed Action. There are no effects to the existing recreational facilities at the Two-Mile Bar Recreation Area due to construction, since construction of the tunnel or decommissioning of the South Main Canal has been designed so it does not occur where there parking lots/restrooms, picnic areas, or access points to the river are located. In the short term for a period lasting between 18 and 24 months, the proposed action to construct the tunnel and tie-in the canal to the tunnel could temporarily affect recreational use at the recreation area by increasing traffic on Two-Mile Bar Road, but it would not close the recreation area or result in a significant increase of traffic or use at other recreational areas in the county. The effects would be limited to brief periods during the day when construction equipment is mobilized and demobilized, during ingress and egress of construction worker's vehicles, and periodic hauling of excavated materials and pouring cement. The construction would diminish the recreational experience of visitors because of delay, noise, dust, and the presence of large construction equipment.

In addition, construction and worker's vehicles could impede or slow down emergency responder's access when they need to use Two-Mile Bar Road to access the Stanislaus River and the recreation area for emergency search and rescue operations, assisting with accidents or injuries, or fire suppression. The ingress and egress of construction and worker's vehicles into the laydown/staging area along the same road used by visitors could diminish the recreational experience visually and cause periodic traffic congestion. However, the facilities at the Two-Mile Bar Recreation Area would remain open and available at the existing levels and types of recreational activities during construction once implementation of the proposed action to construct the tunnel begins. Effects to recreational use during periodic hauling of the materials would be intermittent and not continuous throughout the day due to the wait time needed to excavate enough materials out of the tunnel to be loaded into the haul trucks.

Indirect effects

There are potential indirect effects to recreational use after construction of the tunnel is completed. Indirect effects could occur when the canal is blocked or sectioned off and during maintenance periods for the tunnel and mitigation plantings. Any significant direct, indirect, and cumulative effects on recreational use at the Two-Mile Bar Recreation Area would be avoided, since BMPS would be implemented and the number of vehicles used during post construction activities requires a limited number of vehicles.

3.2.2.3 Mitigation

Effects to recreational facilities at the Two-mile Bar Recreation Area are avoided due to the design where tunnel and canal work does not occur at these locations with recreational facilities. Adverse effects to recreational use of the recreation area would be reduced with the use of the following BMPs:

- Unpaved access roads leading to the construction site would be watered to control dust, and

- Traffic mitigation BMP measures (see Section 3.9.3) such as the use of flaggers to control traffic on Two-Mile Bar Road would help ensure that the proposed action does not impede safe and convenient public and emergency response vehicles access to the recreation area during construction activities.

3.2.3 Water Resources and Water Quality

Water resources include surface water and groundwater. Surface water resources include lakes, rivers, streams, and wetlands. These can be important to economic, ecological, recreational, and human health resources. Groundwater includes subsurface hydrologic resources and is an essential resource. Groundwater properties are often described in terms of depth to aquifer or water table, water quality, and surrounding geologic composition.

The Clean Water Act (CWA) (33 U.S.C. §1251 et seq.) is the Federal law that regulates discharges of pollutants into waters of the United States, including oceans, lakes, rivers, and other surface water systems. State water quality programs and regulations are chiefly the products of Federal mandates put into effect through the CWA and managed by the U.S. Environmental Protection Agency (EPA). The CWA requires that states establish numerical water quality criteria for a host of toxic discharges. In-stream water quality objectives and standards are contained in region-based water quality control plans, more often referred to as basin plans. In California, the nine local Regional Water Quality Control Boards, administer the hydrologic basin and associated basin plan.

Under CWA Section 401 (33 U.S.C. §1341), applicants for a Federal license or permit to conduct activities that could result in the discharge of a pollutant into waters of the United States must obtain certification from the state in which the discharge would originate or, if appropriate, from the interstate water pollution control agency with jurisdiction over affected waters at the point where the discharge would originate. Therefore, all projects with a Federal component that could affect state water quality (including projects that require Federal agency approval) must also comply with CWA Section 401. The Section 401 water quality certification ensures that the proposed activity would not violate state water quality standards. The Central Valley Regional Water Quality Control Board (Water Board) administers Section 401 requirements of the CWA and the Water Quality Control Plan for the action area.

In addition, the State Water Resources Control Board, through its nine Regional Water Quality Control Boards, has been authorized by EPA to administer the National Pollutant Discharge Elimination System (NPDES) permits required under section 402 of the CWA. In part, this section of the CWA requires that discharges of stormwater associated with a construction activity that disturbs more than 1.0 acre be regulated as an individual discharge that must be permitted.

The Corps regulates structures and work in navigable waters of the United States that affect the navigable capacity of such waters under Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. §403). The Corps also regulates the discharge of dredged or fill material into all regulated waters of the United States, including wetlands, under Section 404 of the CWA (33 U.S.C. §1344).

3.2.3.1 Existing Conditions

Surface Water. The Stanislaus River is located approximately 800 feet northwest of the proposed action area. The Stanislaus River is one of eight major tributaries to the San Joaquin River. The Stanislaus River traverses the OID service area downstream from Goodwin Dam. OID's primary diversion point for irrigation water is from Goodwin Dam. After water is diverted, a series of canals, pipelines, and ditches convey water through the OID service area, including the South Main Canal. Figure 1-3 shows the location of the Stanislaus River in relation to the proposed tunnel alignment.

Groundwater. The San Joaquin Valley Groundwater Basin extends from the southern edge of the Sacramento River Groundwater Basin to the San Emigdio and Tehachapi Mountains. The basin includes all or portions of Sacramento, Amador, Contra Costa, San Joaquin, Calaveras, Stanislaus, Merced, Madera, Fresno, Tulare, Tuolumne, Kings, and Kern Counties. The San Joaquin Valley Groundwater Basin covers an approximately 13,800-square-mile area and is divided into 16 groundwater subbasins. The proposed action area overlies the Modesto Subbasin. The Modesto Subbasin is bounded to the north by the Stanislaus River, to the west by the San Joaquin River, to the south by the Tuolumne River, and to the east by the foothills of the Sierra Nevada Mountains. Groundwater quality in the OID service area appears to be generally good according to a limited examination of data; however, local impairments exist in the Modesto Subbasin. Groundwater impairments within the Modesto Subbasin include areas of elevated concentrations of boron, chloride, dibromochloropropane, iron, manganese, nitrate, and TDS (Department of Water Resources, 2004).

3.2.3.2 Effects

Basis of Significance. Effects on water resources or water quality would be considered significant if an alternative would cause any of the following:

- Alter the quantity and quality of surface runoff
- Degrade water quality
- Violate water quality standards or waste discharge requirements
- Substantially alter the existing drainage pattern of the site or area such that flood risk or erosion and siltation potential would increase
- Create or contribute to runoff that would exceed the capacity of an existing or planned stormwater management system
- Reduce groundwater quantity or quality

No Action. This alternative would have no effect on existing surface water or groundwater resources or water quality.

Proposed Action. In a letter dated November 12, 2012, from the Corps' Regulatory Division in Sacramento, it was determined that wetlands and waters of the United States would not be affected by the proposed action, since the tunnel, canal, staging areas, and mitigation plantings has been designed so it would not be constructed through wetland, vernal pools, and streams and no placement of fill into waters of the U.S. Thereby, no 401 water quality certification and permits under Section 404 of CWA are needed.

There is no reduction in groundwater quantity or quality, since there is no proposed construction work in streams or nearby vernal pools/wetlands. OID's proposed action to construct the tunnel would not create or contribute to runoff that would exceed the capacity of an existing or planned stormwater management system. Based upon that there is no reduction in groundwater quantity or quality and would not create or contribute to runoff that would exceed the capacity of an existing or planned stormwater management system, there are no significant effects. The project has been designed for continuous uninterrupted conveyance of OID irrigation water to downstream water users, and thereby, avoiding adverse effects to water quality and quantity including the areas where water is delivered to the various water users further downstream. After the tunnel is completed and the tie-ins are constructed at the portals, water would be diverted from the abandoned canal to the bypass tunnel prior to canal breaching activities. The proposed action would generate approximately 20 to 100 cubic yards of soil, rock, and tunnel muck per work day. The total volume of the rock and soil material to be removed is estimated to be 226,030 tons.

Spoil piles placed in upland areas could erode the surface affecting nearby surface and groundwater resources if not protected, which could potentially cause a significant effect if surface runoff flowed into secondary tributaries flowing into the Stanislaus River and the nearby vernal pools. By design, OID would avoid this potential adverse effect with the location of the tunnel portals and spoil piles placed far away from surface waters and by loading tunnel muck directly into haul trucks and disposing of the muck at the nearest licensed facility. Under OID's oversight of construction of the tunnel, the contractor would prepare a Stormwater Pollution Prevention Plan (SWPPP) that would include BMPs to reduce the potential for soil erosion affecting surface and groundwater resources. OID would have a full-time inspector onsite to confirm proper implementation of applicable BMPs. Proper implementation of the BMPs would assure that soils found within and surrounding the proposed action area is not adversely affected so that erosion results in significant effects to water quality.

Groundwater depth in the Modesto Subbasin in consistently greater than 200 feet; therefore, the proposed action would not disturb groundwater or have an effect on groundwater supplies. The old canal section would be abandoned in place after construction of the tunnel. Storm flow runoff from the eastern slope would still enter the canal and drain to the Stanislaus River during high-flow periods. In order to prevent water from accumulating or being transported in the old canal, this section would be blocked or sectioned off in selected areas based on the topography such that the natural drainage pattern would be restored.

By design and the distance away from any stream or water source, there is no altering of the quantity and quality of surface runoff that could significantly affect water quality. Prior to commencing construction activities to construct the tunnel, the contractor would develop and implement a SWPPP to reduce the amount of sediment discharged to surface or groundwater resources from the site. Potential degradation to water quality could occur if the SWPPP is not

implemented and BMPs are not implemented as required. However, additional mitigation measures have been proposed to help reduce the level of effect to less than significant.

Indirect Effects

After construction of the tunnel is completed, there are potential indirect effects to surface and groundwater quality, since mitigation plantings and maintenance and monitoring activities at the downstream portal of the tunnel are located in close proximity to the vernal pools where workers could accidentally drive, walk, or spill materials into them. However, the effects would be avoided while OID implements BMPs described below to avoid or reduce the effect to less than significant.

3.2.3.3 Mitigation Measures

A NPDES stormwater permit could be required if the proposed action would result in more than one acre of construction-related land disturbance. Implementation of BMPs by OID would be used to reduce any potential effects to surface and groundwater quality. The mitigation measures/BMPs listed below apply to reducing and minimizing the direct and indirect effects to water quality on the surface. Implementation of these mitigation measures would assure there would not be significant effects. OID would develop and implement an ECSPP that identifies BMPs that protect local and downstream water quality in accordance with the requirements of the lead agency. The BMPs would minimize the potential for sedimentation and releases of hazardous materials during construction. The ECSPP would include installation of temporary bypasses to maintain local hydrology (both drainage within the stream channels and water conveyance/ drainage) through and around the construction footprint.

The ECSPP, which would be developed in coordination with the lead agency as part of the stormwater permitting processes, would include the following minimum requirements:

- Disturbances within drainages that ultimately drain to the streams would be limited during construction.

- Vegetation would be left in place to the degree possible to reduce potential sedimentation and protected with vegetative fencing.

- Filter fabric, straw bales, and wattles would be used to minimize erosion and the potential for sedimentation runoff into the vernal pool complex.

- Native seeding and revegetation would be initiated as soon as possible (timed properly to coincide with fall/winter precipitation) after construction completion.

In minimizing the adverse effect to water quality, soil erosion or loss of topsoil during construction activities would be minimized through adherence to the BMPs and preventive measures outlined in the project's Stormwater Pollution Prevention Plan (SWPPP). OID would file a Notice of Intent with the State Water Resources Control Board in accordance with the General Permit for Stormwater Discharges Associated with Construction Activity. OID would assure that the SWPPP and Erosion Control and Spill Prevention Plan (ECSPP) are maintained onsite and that all water quality standards are implemented. The SWPPP and ECSPP would

incorporate sediment and erosion controls, such as silt fences and erosion control blankets. After construction ends for each season, disturbed areas would be stabilized with straw or hydroseeded with native grasses.

The SWPPP and ECSPP would include, but not be limited to, the following measures:

- During the rainy season, temporary erosion and sediment control BMPs would be placed and be operational at the end of each construction day and maintained until permanent erosion control features are in place.

- Areas where upland vegetation needs to be removed would be identified in advance of ground disturbing activities and limited to only those areas approved by OID.

- BMPs including installation of filter fences, straw bales, or wattles would be placed below all construction activities to intercept sediment before it reaches the waterway.

- Sediment control measures would be in place prior to the onset of the rainy season and would be monitored and maintained in good working condition until disturbed areas have been stabilized.

- Erosion and sediment control measures listed in permits obtained for the proposed action would be implemented.

- If the contractor stores onsite an aggregate volume of greater than 1,320 U.S. gallons of petroleum-based products (e.g., diesel, gasoline, oil, and hydraulic fluid) in aboveground tanks that are 55-gallons or larger (including operational equipment), the contractor would prepare a spill prevention control and countermeasures plan with measures including, but not limited to, the following:

- Storage areas for fuel and liquid materials would be located away from drainages and other surface water features.

- Storage areas would be lined with an impermeable material to prevent the release of fuel, oil, grease, or hydraulic fluid in the event of a spill.

- The storage site would be separated from adjacent surface runoff by secondary containment berms having sufficient dimensions to retain the volume of fluids within the storage area.

- Adequate drainage would be provided to collect and dispose of precipitation that enters the storage area.

- Parts of the proposed action area would be specifically designated for routine maintenance and repair of equipment, motors, and systems using oil, grease, or hydraulic fluid.

- If a fuel or chemical spill occurs that cannot be cleaned up by onsite personnel, work in the area of the spill should halt, and the local fire department would be contacted immediately. The affected area would be cleaned, and stained material would be disposed of at a landfill licensed to handle such material. Work in the area of the spill would be allowed to resume when determined appropriate by OID.

3.2.4 Air Quality

3.2.4.1 Existing Conditions

Regulatory Background. At the Federal level, the EPA is responsible for overseeing implementation of the Federal Clean Air Act. The CARB is the state agency that regulates mobile sources and oversees the state air quality laws, including the California Clean Air Act. Local air pollution control districts are responsible for ensuring compliance with Federal, state, and local air quality regulations. Specifically, the districts issue permits and enforce regulations to protect public health and the environment in accordance with the Federal and state Clean Air Acts. Air regulatory oversight in the proposed action area is provided by the Tuolumne County Air Pollution Control District. Federal actions in a designated nonattainment zone must comply with the general conformity *de minimis* threshold requirements under the Clean Air Act (Section 176[c][1]).

The portion of the proposed action area located in Tuolumne County is within the Mountain Counties Air Basin (ARB, 2010). The topographic boundaries of the Mountain Counties Air Basin, coupled with light winds and atmospheric stability, make the basin susceptible to the accumulation of air pollutants. The typical summer circulation transports pollution for long distances. The major air pollution problems in the basin are high concentrations of oxidants and suspended particulate matter. Both pollutants frequently exceed air quality standards. Tuolumne County is designated as nonattainment for both ozone state ambient air quality standards (1-hour and 8-hour).

The remainder of the proposed action area is located within the San Joaquin Valley Air Basin. San Joaquin Valley Air Basin has one of the most severe air pollution problems in the state of California and the nation (San Joaquin Valley Air Pollution Control District [SJVAPCD], 2002). The primary pollutants of concern within the area are ozone and particulate matter less than 10 micrometers in aerodynamic diameter (PM_{10}), because concentrations of these pollutants have exceeded ambient air quality standards. SJVAPCD is designated as nonattainment for the ozone 1-hour, ozone 8-hour, PM_{10}, and particulate matter less than 2.5 micrometers in aerodynamic diameter (SJVAPCD, 2008). The combination of heat and sunlight transform volatile organic compounds and nitrogen oxide (NO_x) from vehicle exhaust, industrial processes, and other operations into ground-level ozone. Additionally, small particles of human-made compounds such as soot, ash, and dust become suspended in the air to create particulate matter. The topography of the basin exacerbates the problem by limiting dispersion and dissipation of the regional pollutants.

The SJVAPCD is the local agency charged with preparing, adopting, and implementing mobile, stationary, and area air emission control measures and standards. The proposed action is required to comply with SJVAPCD rules and regulations including Regulation VIII, Fugitive PM_{10} Prohibition during construction and Rule 9510, Indirect Source Review.

Sensitive Receptors. Sensitive receptors include those humans and wildlife that could be affected by changes in air quality due to emissions from construction activities. Sensitive land uses in the proposed action area include recreational visitors and wildlife.

3.2.4.2 Effects

Methodology. Air quality effects were evaluated by identifying all potential air emission sources associated with the proposed action, evaluation of potential emissions, evaluation of existing requirements for their control, and determination of onsite measures to reduce them to minimize adverse effects.

Basis of Significance. An alternative would be considered to have a significant effect on air quality if it would do any of the following:

- Violate an ambient air quality standard
- Contribute on a long-term basis to an existing or projected air quality violation
- Expose sensitive receptors to substantial pollution concentrations
- Not conform to applicable Federal, state, and local standards

No Action. Except for short term air quality effects that result periodically from park staff using heavy equipment or other gas-emitting vehicles or equipment such as generators and from O&M activities of the recreational facilities and public vehicles at the Two-mile Bar Recreation Area and South Main Canal, this alternative would not result in significant effects on existing air quality in the project area. Air quality would also continue to be influenced by climatic conditions, wild fires, and local and regional emissions from vehicles and agriculture.

Proposed Action. Gas emissions from construction equipment would be dependent on the contractor's construction preference and project approach. It is anticipated that 90 percent of the emissions would be generated by diesel-powered equipment. The contract documents would allow the contractor some degree of flexibility on their chosen construction methods, but some initial assumptions could be anticipated. The sources of gas emissions would include the removal of tunnel spoils from the project area to a disposal site within 15 miles of the project site using highway dump trucks or transfer trucks. Site emissions would be generated by diesel power generators used to power the tunnel ventilation system, tunnel excavation equipment, and small construction equipment. Transport of the excavated tunnel spoils to the spoils transfer area would potentially be performed by diesel-powered, rubber-tired mining equipment or diesel-powered rail system with rail being the likely preference. Surface construction equipment would include excavators, dozers, graders, and other earth-moving equipment. Table 3-1 shows the gas emitting equipment, number of trips, and estimated number of hours of operating this equipment.

In relation to constructing the tunnel, air quality effects are evaluated in terms of annual emissions from constructing and operating the Proposed Action. The SJVACPD thresholds of significance were used for the portion of the proposed action in Tuolumne County and the portion in the San Joaquin Valley Air Basin. Table 3-2 shows the thresholds for evaluating

whether construction or operation emissions would be significant (SJVAPCD, 2002). Construction emissions for the proposed action were estimated and compared to the thresholds to evaluate air quality effects (see Table 3-3). Operation of the heavy such as excavators or drill and worker's vehicles and generators or diesel-powered pumps, etc. to construct the tunnel would contribute as sources of air emissions, and therefore, there would be short term effects on air quality. The total volume of the rock and soil material to be removed from the excavated tunnel is estimated to be 226,030 tons.

Potential short-term effects would occur during construction. In nonattainment areas, construction equipment exhaust emissions of ozone precursors (NO_x and ROG), exhaust PM_{10}, and soil-disturbing activities would adversely affect air quality (pollutants and dust) for sensitive receptors such as recreational users, construction workers, park staff, emergency responders, and wildlife. These adverse effects are temporary and would not be substantial and significant due to the limited number of construction equipment used and implementation of BMPs to reduce the effect. The SJVAPCD's approach to NEPA analyses of construction PM_{10} fugitive dust impacts is to require implementation of effective and comprehensive control measures rather than to require detailed quantification of emissions. Compliance with SJVAPCD Regulation VIII is considered to be sufficient to reduce a project's construction-related fugitive dust effects to less than significant. Construction exhaust emissions of NO_x, ROG, and PM_{10} were estimated using the modeling software URBEMIS2007 Version 9.2.4 and EMFAC2007 Version 2.3. Table 3-3 presents the unmitigated annual air quality effects from construction, which would be less than significant with OID implementing the BMPs as identified later below.

Table 3-1 Gas-emitting Equipment Information

2-Mile Bar SJVAPCB ISR estimate														
Assume: Maximum Project Time, 18 Months (50 weeks per year work, five days per week, one shift per day)														
	cu yds.	*trips*	*miles/tp*	*total miles*	*hours*	*Notes:*								
General Construction for Mob and Material(hours as shown)														
Clearing and grubbing portals (0.75 acres, 1 foot deep) cu yds.	1,200	0				Clearing and grubbing to be reused onsite in disturbed laydown areas, no off-haul								
dozers					40									
grader					40									
water truck					40									
excavator					80									
Clearing and grubbing lay down areas(2.5 acres 6" deep) cu yds.	2,400	0				Clearing and grubbing to be reused onsite in disturbed laydown areas, no off-haul								
dozers					40									
grader					40									
water truck					40									
excavator					10									
Reclamation of laydown areas		0												
dozers					40									
grader					80									
water truck					80									
excavator					10									
Misc. Materials														
Materials Delivery, Highway Rig Long Haul		10	200	2,000										
Materials Delivery, Local Haul		50	50	2,500										
Trucks and Surface Equipment - General Construction														
fuel truck (1 daily, 5 hours per day)					1,875									
water truck (1 daily, 10 hours per day)					3,750									
concrete truck (tunnel liner, assume Jamestown 20 mile one-way)	2,750	305	40	12,200		Tunnel liner 4 inches, 37-ft perimeter, 6000 long, (37X6000x4/12/27/)								
concrete truck (tunnel invert, assume Jamestown 20 mile one-way)	1,280	142	40	5,680		Tunnel invert 6 inches, 11.5-ft side, 6000-ft long (11.5x6000x6/12/27)								
Excavator - Portals and roadways					200									
Dozers - Portals and roadways					50									
10 yd. dump truck Portals and roadways (9 yds. haul load)	2,000	220	20	4,400	70	Assume 300 yards loose excavation volume, average 10 MPH for load/haul								
10 yd. dump truck (Ohe's) use 9 yds. haul load	55,000	6,100	20	122,000	6,100	Tunnel Spoils (176x6000x1.4/27) Average 20 MPH for loading and hauling								
Loader for tunnel spoils pile to dump truck					3,050	0.5 hour per trip per average load								
Tunnel Excavation and Tunnel Spoils Removal	55,000					Loose Yards								
20-yard Diesel Ore Cars	55,000	2,750	1.2	3,300	550	20 yards/trip, average speed of 6 miles per hour								
Tunnel excavation and conveyor ore car loading - Electric	55,000				3,000	No Emissions, included in Generator Loading								
Tunnel Ventilation and Misc. mining small - Electric					3,000	No Emissions, included in Generator Loading								
100 HP Diesel Generator Loading					2,500	1 year, 10 hours per day								
150 HP Diesel Generator Loading					3,750	1 year, 15 hours per day (overlapping with 100 HP Generator for highest mid-project loadin								
Tunnel Construction Workers (10/day M-F)														
Roundtrip miles (assume Oakdale or Sonora, avg. 20 miles one way)		10,000	40	400,000		Assume average crew of 20, including all onsite personnel, inspectors, office								
		5,000	40	200,000		Assume average car pooling of 2 per car								

TABLE 3-2. Air Quality Threshholds of Significance for Construction and Operation – SJVAPCD

Pollutant	Tons per Year
ROG	10
No_x	10
PM_{10} from fugitive dust[a]	15

[a] Compliance with SJVAPCD Regulation VIII reduces the effect to less than significant.
Source: SJVAPCD, 2008
Note: ROG= reactive organic gas

TABLE 3-3. ESTIMATED ANNUAL CONSTRUCTION EMISSIONS

Construction Phase (Year)	NO_x	ROG	PM_{10} from Exhaust	PM_{10} from Fugitive Dust
2015 Totals (ton/year unmitigated) (clearing and grubbing)	1.84[a]	0.14[a]	0.07[a]	0.47[a]
2015 Totals (ton/year unmitigated) (tunnel boring Phase I)	1.86[a]	0.18[a]	0.07[a]	Not applicable
2015–2016 Totals (ton/year unmitigated) (tunnel boring Phase II)	3.82[a]	0.41[a]	0.16[a]	Not applicable
2015–2016 Totals (ton/year unmitigated) (invert installation)	0.08[a]	0.004[a]	0.003[a]	Not applicable
SJVAPCD Threshold (ton/year)	10	10	No threshold	No threshold

[a] Calculations based on 1-year construction schedule. Construction has been extended to approximately 2 years according to the updated work plan; therefore, actual annual emissions would be less than values displayed in table.
ton/year = ton(s) per year

District Rule 9510 does not apply to the proposed action because it would not result in increased capacity or activity. However, as an applicant-proposed measure to confirm compliance with SJVAPCD Regulation VIII, OID would require that all contractor equipment meet or exceed the latest air quality standards and that fugitive dust control measures are implemented, which would achieve a 20 percent reduction in NO_x emissions compared to the statewide average.

In a correspondence dated July 12, 2010 (see Appendix B), SJVAPCD concurred after review that specific emissions of criteria pollutants as a result of the proposed action are not expected to exceed the SJVAPCD significance thresholds of 10 ton/year NO_X, 10 ton/year ROG, and 15 tons/ year PM_{10}. Therefore, the SJVAPCD concludes that project-specific criteria pollutant emissions would have no significant adverse effect on air quality. Additionally, the proposed action would not result in an increase in capacity or activity. Therefore, District Rule 9510, Indirect Source Review, requirements and related fees do not apply to the proposed action for the project.

Indirect Effects

After construction of the tunnel is completed, there are potential temporary post- construction indirect effects to air quality (pollutants and dust) affecting humans working or recreating in the area and wildlife due to the oak/grassland mitigation and monitoring activities and periodic inspections and maintenance of the tunnel. This temporary effect to inspect and maintain the tunnel and mitigation would be limited to no more than two passenger cars or trucks and reduced to less than significant with OID implementing the BMPs listed below.

3.2.4.3 Mitigation Measures

Although the construction emission would not exceed the established California Environmental Quality Act thresholds of significance, OID would require the construction contractor to implement the following BMP measures, which are required by Regulation VIII (SJVAPCD, 2002) for all construction projects regardless of significance:

- All disturbed areas, including storage piles that are not actively used for construction purposes would be effectively stabilized for dust emissions by using water or a chemical stabilizer or suppressant; by covering with a tarp or other suitable cover; or by vegetative groundcover.

- All onsite unpaved roads and offsite unpaved access roads would be effectively stabilized for dust emissions by using water or a chemical stabilizer or suppressant.

- All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities would be effectively controlled for fugitive dust emissions by applying water or by presoaking.

When materials are transported offsite, materials would be covered or effectively wetted to limit visible dust emissions; at least 6 inches of freeboard space from the top of the container would be maintained.

- All operations would limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each workday. (The use of dry rotary brushes is expressly prohibited, except where preceded or accompanied by sufficient wetting to limit the visible dust emissions; use of blower devices is forbidden.)

- After the addition of materials to or the removal of materials from the surface of outdoor storage piles, the piles would be effectively stabilized for fugitive dust emissions by using sufficient water or a chemical stabilizer suppressant.

- Within urban areas, track-out would be immediately removed when it extends 50 or more feet from the site and at the end of each workday.

- Carryout and track-out would be prevented at sites with 150 or more vehicle trips per day.

3.2.5 Vegetation and Wildlife

Biological resources consist of plants, animals, and their habitats. These resources provide aesthetic, recreational, and socioeconomic benefits to society. This section describes plant and animal species that occur or are likely to occur in the proposed area of OID's tunnel, canal, and staging areas.

3.2.5.1 Existing Conditions

CH2M HILL conducted wildlife and botanical surveys in September 2009 to evaluate the presence of habitat for various wildlife and botanical species that could be affected by the proposed action where right-of-way access is granted to OID so it could construct the tunnel and blocking or sectioning off the South Main Canal on applicable portions of private lands. A wetlands assessment was conducted on September 21, 2009, concurrent with the preliminary biological survey effort. Figure 3-2 shows the vegetation communities found in the vicinity of the proposed tunnel alignment.

Vegetation

The proposed action area for OID's tunnel, canal work, and staging areas consists of nonnative grassland, mixed hardwood forests, oak woodlands including mixed oak forest, blue oak woodland, and cottonwood-willow riparian forest. In the northern portion of the proposed action area, the species present are characteristic of oak savannah: blue oak (*Quercus douglassii*) dominating the tree canopy and nonnative grasses including ripgut brome (*Bromus diandrus*), medusahead (*Taeniatherum caput-medusa*), wild oats (*Avena fatua*), and other annual non-native and native forbs dominating the understory. Appendix A, Photograph 2 shows blue oak woodland near the upstream portal staging area; and Photograph 3 shows existing grassland in a potential additional staging area.

In the central portion of the proposed action area adjacent to the South Main Canal, dominant plant communities on the western side include cottonwood-willow riparian forest and mixed oak forest. The riparian vegetation along the west side of the South Main Canal consists of arroyo willow *(Salix lasiolepis)*, red willow *(Salix laevigata),* and cottonwood (*Populus* spp.).

The mixed oak forest vegetation consists of blue oak, canyon live oak (*Quercus chrysolepis*), coffeeberry (*Rhamnus californica*), mountain mahogany (*Cercocarpus betuloides*), toyon (*Heteromeles arbutifolia*), buckeye (*Aesculus glabra*), and manzanita (*Arctostaphylos glauca*). The eastern portion of the canal is dominated by blue oak woodland.

The southern portion of the proposed action area is dominated by mixed oak forest on the western side and blue oak woodland on the eastern side of the canal. Along the top banks of the canal, scattered vegetation consists of low-growing forbs in a narrow band, including the following species: Italian rye (*Lolium multiflorum Lam.*), cudweed (*Gnaphalium* sp.), cockle burr *(Xanthium strumarium)*, dove weed (*Eremocarpus setigerus*), and curly dock (*Rumex crispus*). Appendix A, Photograph 4 shows the vegetation community near the downstream portal staging area. Plant species identified during the site visit are provided in Appendix C.

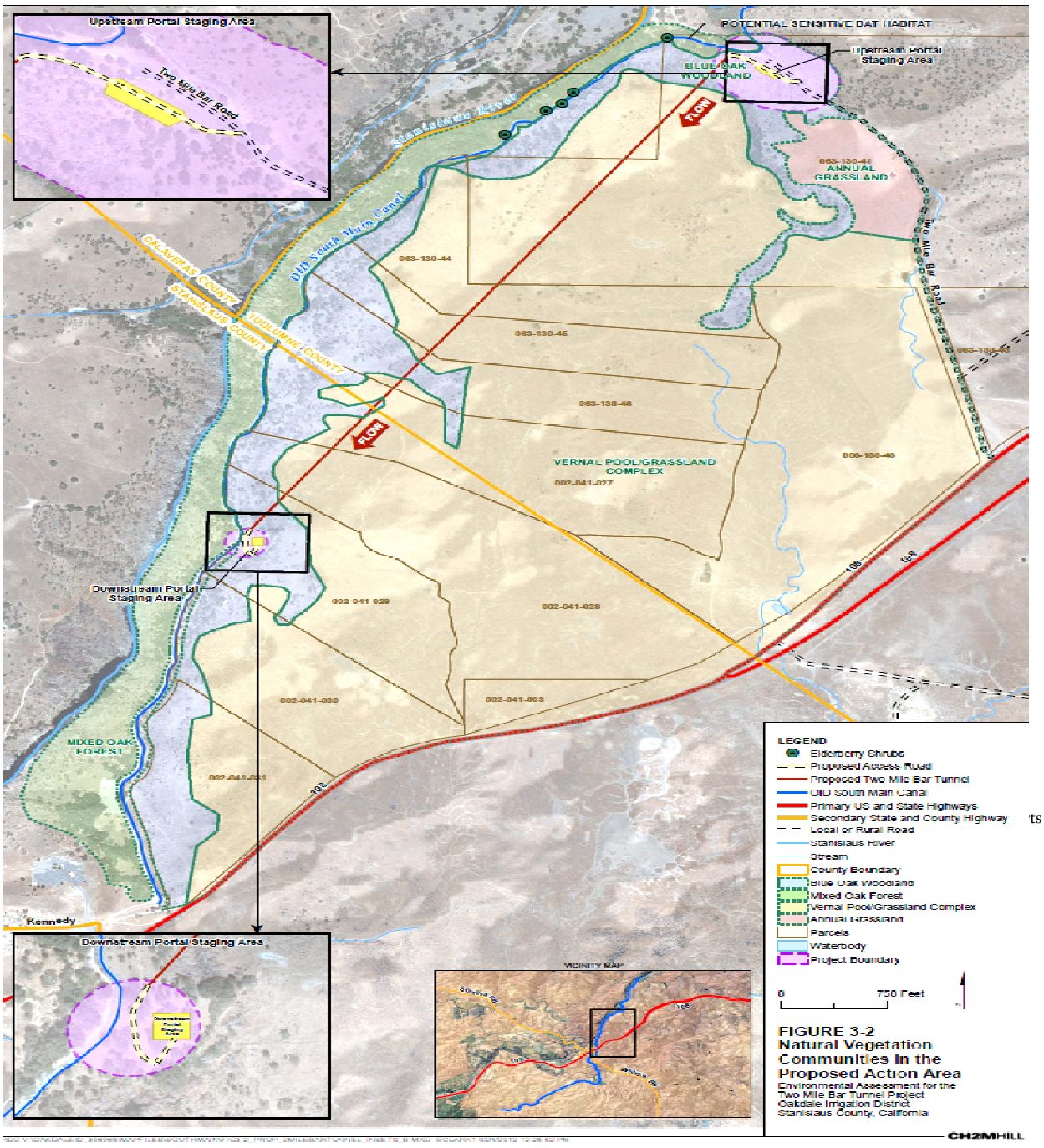

Figure 3-2. Vegetation Communities Found in the Vicinity of the Proposed Tunnel Alignment.

Valley Elderberry Longhorn Beetle. The VELB (*Desmocerus californicus dimorphus*) was listed as a threatened species under the Federal ESA on August 8, 1980 (50 Code of Federal Regulations 17.11). The beetle is dependent on its host plant, the elderberry (*Sambucus* spp.), which is a locally common component of the remaining riparian forests and savanna areas of the Central Valley. In most cases, the only evidence of the shrub's use by the beetle is an exit hole created by the larva prior to the pupal stage. VELB larvae tend to be distributed in elderberry stems that are 1-inch or greater in diameter at ground level (USFWS, 1999).

Population densities of the beetle are most likely naturally low (USFWS, 1984). Studies suggest that, based on the spatial distribution of occupied shrubs, the beetle is a poor disperser (Barr, 1991). Low-density and limited dispersal capabilities cause the beetle to be vulnerable to the adverse effects from the isolation of small subpopulations due to habitat fragmentation. Moreover, once a small VELB population has been extirpated from an isolated habitat patch, it is likely that the species would be unable to re-colonize the patch if it is unable to disperse from nearby occupied habitat (USFWS, 1999).

Wildlife

General Wildlife Use. Fauna species observed are those found in blue oak woodland, mixed oak forest, nonnative grasslands, and riparian habitats. The blue oak woodland habitat provides high wildlife values (food and cover) for many wildlife species, especially migratory birds. The species were identified by direct observation, tracks, burrows, nests, or scat. Species included raccoon *(Procyon lotor)*, mule deer *(Odocoileus hemionus),* grey fox (*Urocyon cinereoargenteus),* rabbit (*Sylvilagus* sp.), mountain lion (*Felis concolor),* coyote (*Canis latrans),* rattlesnake (*Crotalus oreganus),* great horned owl (*Bubo virginianus),* and turkey vulture *(Cathartes aura).* A complete list of species observed during the site visit is provided in Appendix C.

Roosting Bats. Although three Federal and state-listed species of concern bat species (western red, western mastiff, and Yuma myotis) are known to occur within or near the proposed action area, no roost sites have been documented in the proposed action area (CNDDB, 2006). The proposed action area was surveyed for potential roosting bats and suitable roosting habitat during the reconnaissance survey. During the field visit, roosting bats were not observed in or adjacent to the proposed action area, but the entire proposed action area supports suitable foraging habitat for bat species because it occurs along the Stanislaus River corridor. A follow-up survey was conducted on October 26, 2009, to determine where suitable bat roosting sites and potential construction-related effects could occur. Several suitable roosting sites occur within the proposed action area at the South Main Canal. These sites occur to the north along the cliff faces near the upstream portal.

Raptors and Migratory Birds. Migratory birds and their habitats are protected under the Migratory Bird Treaty Act (MBTA), as amended (16 United States Code [U.S.C.] 703 et seq.). Several migratory birds, including waterfowl, shorebirds, song birds, hummingbirds, vultures, corvids, and cliff-dwelling raptors commonly are found along the Stanislaus River. Songbirds, in particular, have the potential to use riparian and oak woodland habitat within the action area, including the white-crowned sparrow (*Zonotrichia leucophrys),* white-throated swift (*Aeronautes saxatalis),* mourning dove (*Zenaida macroura),* spotted towhee (*Pipilo maculates),* western scrub jay (*Aphelocoma californica),* and Anna's hummingbird (*Calypte anna).*

For the EIR, the proposed action area to construct OID's tunnel was subject to reconnaissance level of survey in 2010 by CH2M Hill for raptors, migratory birds, and suitable nesting habitat. During the field visit, several raptor and migratory bird species were observed; because the surveys occurred after the breeding season, no active nests were observed. However, several nest sites were identified along the rock cliffs adjacent to the South Main Canal. Two large stick nests and one platform scrape nest were observed on the cliff face. These nests could be attributed to cliff-dwelling raptors such as prairie or peregrine falcons (*Falco mexicanus* or *F. peregrinus*), respectively, or could be associated with corvids, such as ravens or crows. These nest sites had recent white wash, indicating use during the breeding season. A small colony of about 20 white-throated swifts *(Aeronautes saxatalis)* was also observed using the cliff faces. This species nests in the cracks and crevices and ledges of cliff faces. Swallow nests were also observed in various locations in the same general areas. Appendix C provides a list of avian species observed.

3.2.5.2 Effects

Basis of Significance. Effects on vegetation and wildlife would be significant if the alternative results in the following:

- Substantial loss, degradation, or fragmentation of any natural vegetation communities or wildlife habitat

- Interference with the movement of any resident or migratory wildlife species

No Action. The No Action alternative would not have any effect on existing vegetation, wetlands, wildlife, or terrestrial habitat because the plant types and wildlife habitat would be expected to remain the same.

Proposed Action

Vegetation. Granting OID right-of way for access onto Corps property so it could construct the tunnel on private land involves permanent surface ground disturbances at the upstream tunnel portals and terrestrial habitat totaling approximately 0.1 acre of a younger stand of blue oak woodland and 4.20 acres of associated non-native grasses. The oaks provide high value habitat for many wildlife species. No other associated trees or shrubs would be affected at the upstream or downstream portal. No vegetation is expected to be disturbed on the Corps' property at the Two-Mile Bar Recreation Area. Temporary construction effects to vegetation found on private land are summarized in Table3-4. Much of the terrestrial habitat found within the proposed construction staging areas and construction access has already been degraded through the previous development of the South Main Canal, the recreational area parking lot, grazing, and access roads. At two locations at the portals, the permanent loss of 14 to 16 blue oaks covering an area of 0.10 acre of blue oak woodland habitat would not result in a significant loss, degradation, or fragmentation of a vegetation or wildlife community.

TABLE 3-4
Temporary Construction Effects of the Proposed Issuance of Right-of-Way to OID

Location	Vegetation Type	Acreage
Upstream Access and Portal Staging/Laydown Area	Blue oak woodland	0.05
	Non-native grasses	3.70
Downstream Access and Portal Staging/Laydown Area	Blue oak woodland	0.05
	Non-native grasses	0.50
Overall Proposed Action Area Boundary Affected		4.30

If the contractor chooses to excavate from both portals simultaneously, or perform work in multiple shifts, the construction period could be somewhat shorter. This could result in a small insignificant change where there are less effects to vegetation and wildlife including special status species such as the CTS compared to starting construction at one end of the tunnel and ending at the other end of it.

After the final engineered designs are complete, re-evaluation of oak tree effects would need to be completed and a final mitigation plan implemented and submitted to the appropriate resource agencies for their review, as determined necessary. The proposed action consisting of temporary staging and laydown areas for construction access would be located to reduce effects to blue oak trees. At this time on private lands, it is estimated that approximately 7 to 8 blue oaks at the upstream portal and 7 to 8 blue oaks at the downstream portal totaling 14 to 16 blue oak trees (0.1 acre) would be removed. If additional oaks are removed than the current estimate, the mitigation ratio would be adjusted accordingly. On private property, the construction contractor would minimize the effects to oaks by creating a temporary access and laydown/staging/spoils transfer area in disturbed areas with non-native grasses or no vegetation encompassing 4.2 acres near the upstream portal and at two locations south of the downstream portal.

A total of 4.3 acres of associated oak woodland/non-native grassland would be affected. Neither Tuolumne County nor Stanislaus County has a tree ordinance that requires oak tree replacement, but the oaks provide high wildlife values such as food, cover, and nesting/roosting habitat for a variety of birds and mammals. With implementation of the design, mitigation plantings, and mitigation measures listed in Section 3.5.3, the proposed action would not result in a significant effect on vegetation and wildlife. The project has been designed to avoid effects to riparian vegetation found growing along the South Main Canal.

Indirect Effects

After the tunnel is constructed, foot or vehicle traffic during the plant establishment, maintenance, and monitoring activities could result in potential indirect effects to vegetation. The effect would be temporary and avoided or reduced to less than significant with the implementation of BMPs such as installing vegetative fencing around nearby oak trees found growing at the portals and on the west side of the South Main Canal and vernal pools.

Wildlife. Construction activities could temporarily disturb wildlife within in the vicinity of the construction area, which is already subject to disturbances from recreational and use of local roads leading into the Two-Mile Bar Recreation Area. The entire proposed action area potentially supports nesting birds during the breeding season.

Roosting Bats. Including the section of the South Main Canal being blocked or sectioned off, migrant bat species occur in the area between April and September and nearby roost/rearing sites could be affected when this canal is blocked or sectioned off after the tunnel is constructed. If construction commences in the nesting season, a roosting bat survey would be performed by a qualified wildlife biologist, and appropriate protocols would be followed. During construction, the onsite biological monitor would continue to monitor for roosting activity near the site.

After the tunnel is constructed, foot or vehicle traffic during the plant establishment, maintenance, and monitoring activities could result in potential indirect effects to wildlife including bats. The effect to resident and non-resident wildlife would be temporary and avoided or reduced to less than significant with the implementation of BMPs described below.

3.2.5.3 Mitigation

Vegetation. The following mitigation and BMPs would be implemented by OID to reduce the effects to less than significant. Effects on vegetation would be minimized by limiting the construction footprint and staging areas to the smallest size possible. Once construction of the tunnel is completed in the disturbed area for the upstream portal staging/laydown, OID would replant and maintain blue oak trees at a 3:1 ratio (48 trees) and seed native grasses over 4.2 acres in a cooperative agreement with the property owner, as necessary. During the plant establishment period, the contractor would decide the appropriate irrigation method to use depending on whether or not it is feasible to use water from the South Main Canal. There is no nearby water source with enough head that could be used at the downstream portal. Once the staging and access roads are no longer used, the disturbed area would be re-seeded with native grasses and planted with blue oak seedlings to compensate for the direct and indirect effects to wildlife. Weed control would be implemented throughout the plant establishment period. To compensate for potential indirect effects, vegetative fencing would be installed around nearby oak trees and riparian vegetation found growing on the west side of the South Main Canal to protect them from canal breaching, foot or vehicle traffic during the plant establishment, maintenance, and monitoring activities if these sensitive habitats are close enough to construction.

Wildlife. To compensate for direct effects to their habitat, 0.1 acre of native oak woodland vegetation would be planted by OID and maintained on private lands during the 3- year plant establishment period including the control of noxious weeds. Where it is in close proximity to the construction footprint, vegetative fencing would be installed around nearby oak trees found growing in close proximity to the areas of the South Main Canal to be blocked or sectioned off and at the vernal pools near the down and upstream portals to protect them from foot or vehicle traffic during the canal breaching, plant establishment, maintenance, and monitoring activities. Effects on wildlife would be minimized by limiting construction and staging areas to the smallest size possible and limiting construction around the portal staging areas to the normal daylight working hours (7:00 a.m. to 7:00 p.m.). In addition, noise reducing equipment would be required on all heavy equipment to reduce the effects on wildlife to less than significant. If this method is used and considering this localized type of tunnel blasting is well below the surface in the ground and confined to the tunnel area, there would be no surface disturbance, and the noise and vibration associated with the blasting would be less than background noise from surface construction activities.

The following BMPs would be implemented to reduce the effect on birds to less than significant:

- Construction would commence during the non-nesting season so that nests would not be affected by tunnel construction activities. If construction commences during the nesting bird season, a pre-construction nesting bird survey would be conducted by a qualified wildlife biologist and accepted protocols followed should nesting birds be discovered.

- The onsite biological monitor would continue to monitor during construction for any nesting activities near the site.

3.2.6 Special Status Species

The Endangered Species Act of 1973 (ESA) (16 U.S.C. §1531 et seq.) protects threatened and endangered (T&E) plants and animals (listed species) and the habitats on which they depend. The ESA requires Federal agencies to ensure that any action it authorizes, funds, or conducts is not likely to jeopardize the continued existence of any listed species or destroy or adversely modify critical habitat for that species. OID conducted an initial meeting and site visit with Maryann Owens/USFWS on February 16, 2010, which focused on potential effects to Federally listed species and their habitat. Through informal consultation, OID worked with USFWS for guidance and concurrence on proposed avoidance measures for sensitive species that potentially occur in the proposed action area. During construction and post construction activities, the Corps will stipulate as a condition for OID to adhere to this guidance based upon the expectation of the Corps completing its Section 7 consultation on Federal species affected by the proposed granting of a right-of-way to OID. By granting access, OID could cross under a500 foot section of Federal land and use Two-Mile Bar Road as access for construction of the tunnel.

3.2.6.1 Existing Conditions

Threatened and endangered species that have the potential to occur in or near the proposed action area were determined through a review of various sources including the USFWS Website, California Natural Diversity Database (CNDDB), California Native Plant Society Inventory of Rare and Endangered Plants, 7th Edition – online edition, and written correspondence between USFWS and the Corps regarding USFWS-designated sensitive species. An official list of Federal species that could occur in the vicinity or ones that could be affected by the Corps' proposed action to issue OID right-of way so it could use Two-Mile Bar Road to construct and maintain the tunnel passing through the Corps' property located adjacent to the Two-Mile Bar Recreation Area was updated and generated in March 2014 (Appendix E). All special-status species listed from these sources were evaluated for their potential to occur in or in the vicinity of the proposed action area. Figure 3-3 illustrates the results of the CNDDB records search for the area within Tuolumne and Stanislaus Counties.

Wetlands, wildlife, and botanical surveys were conducted by CH_2M Hill in September 2009 to evaluate the presence of habitat for various special-status species that could be affected by the proposed action (see Appendix D). Jurisdictional wetlands were not observed in or adjacent to the proposed action area (USFWS, 2008) so no wetland delineation is necessary. Vernal pool habitat was not observed within the alignment of the tunnel or at the staging areas. However,

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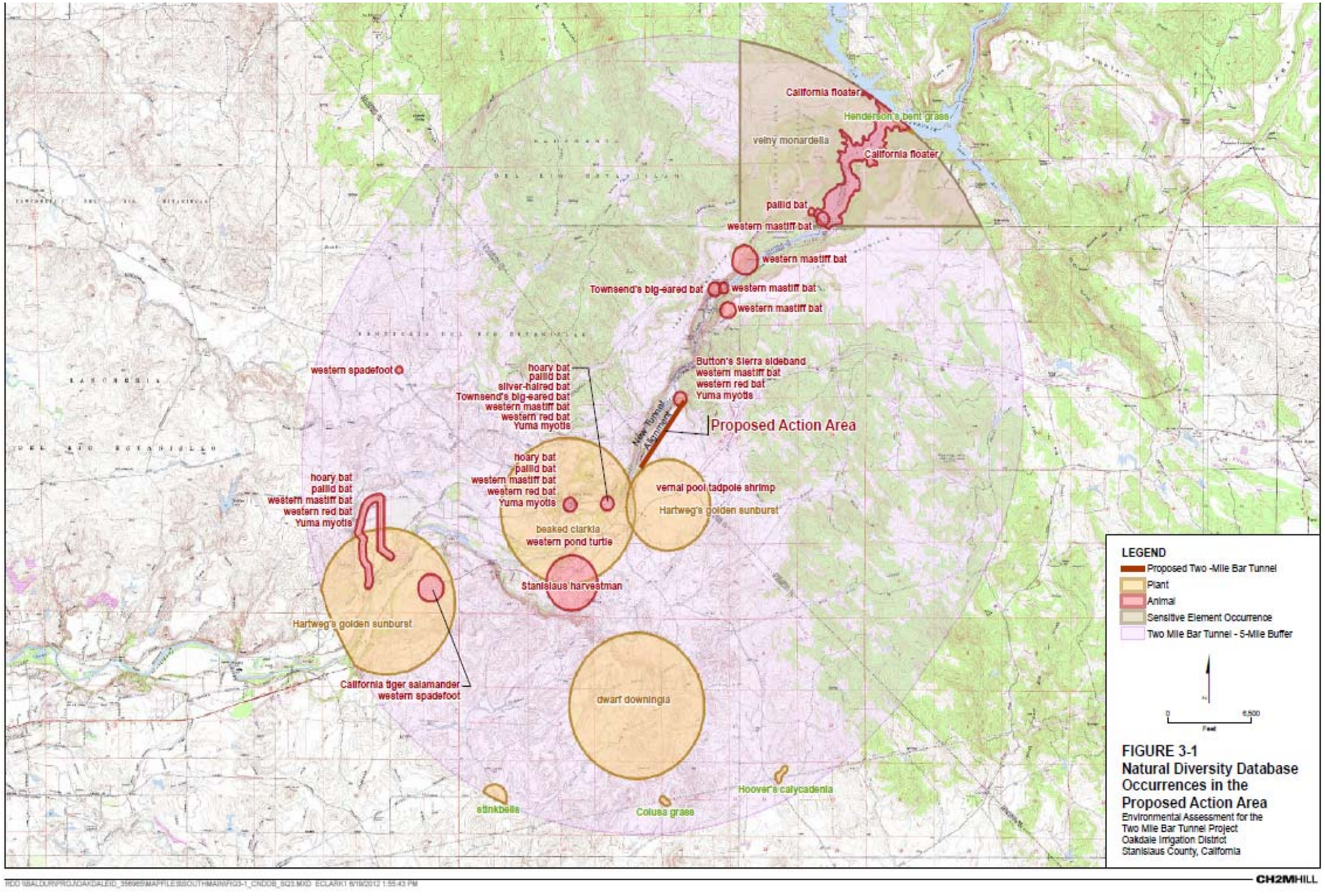

Figure 3-3. Natural Diversity Database Occurrences in the Proposed Action Area

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vernal pools are located within approximately 750 feet (including a 250-foot buffer) of the proposed staging areas for the downstream portal. The northern portion of the proposed action area, located within Tuolumne County, is dominated by blue oak woodlands. In the central and southern portions, located within Stanislaus County, mixed oak forest and blue oak woodlands dominate the proposed action area. Both counties recognize these habitats as sensitive resources. Appendix C includes a technical memorandum (CH2M HILL 2010c) regarding potential special-status plants and animals in the vicinity of the proposed action area. The site review includes site photographs, CNDDB results, USFWS species lists, historical documents related to the proposed action, and an initial meeting and site visit by Maryann Owens/USFWS in February 2010.

Special-status Animal Species. Federal listed species potentially occurring in the Knights Ferry Quad include valley elderberry longhorn beetle, (*Desmocerus californicus dimorphus*), Conservancy fairy shrimp (*Brachinecta conservatio*), vernal pool fairy shrimp (*Brachinecta lynchi), vernal* pool tadpole shrimp (*Lepidurus packardi*), delta smelt (*Hypomesus transpacificus*), Central Valley steelhead (*Oncorynchus mykiss*) and its critical habitat, Central Valley spring-run chinook salmon, (*Oncorynchus tshawytscha*), winter-run chinook salmon, Sacramento River (*Oncorynchus tshawytscha*), San Joaquin kit fox (*Vulpes macrotis mutica*), Colusa grass (*Neostapfia colusana*) and critical habitat, Hartweg's golden sunburst (*Pseudohabia bahifolia*), Greene's tuctoria (*Tuctoria greenei*) and critical habitat, California tiger salamander (*Ambystoma californiense*), and California red-legged frog (*Rana draytonii*).

After review of the CNDDB for Knights Ferry Quad (Figure 3-5) and observations made during the site visit, there are no streams, vernal pools, wetlands, suitable soils, or characteristic riparian/ terrestrial vegetation found at the tunnel portals, access routes leading to the portals, or at the staging/laydown areas to support any of the Federally listed fish, vernal pool plant and animal species terrestrial plants, or California red-legged frog.

Currently, there are four Federally listed faunal species that have the potential to occur in or near the proposed area of where the tunnel would be constructed by OID, at one of the staging areas, and at the tie-in areas with the canal. Those special-status animal species that are known to occur or have the potential to occur nearby are listed in Table 3-5 and the effects are evaluated further in this section.

TABLE 3-5
Special Status Animal Species with the Potential to Occur in the proposed Right-of-Way Area

Species	Common Name	Federal Listing	State Listing
Desmocerus californicus dimorphus	Valley elderberry longhorn beetle	Threatened	None
Ambystoma californiense	California tiger salamander	Threatened	Threatened
Rana aurora draytonii	California red-legged frog	Threatened	None
Vulpes macrotis	San Joaquin kit fox	Endangered	Threatened

Valley Elderberry Longhorn Beetle. The VELB (*Desmocerus californicus dimorphus*) was listed as a threatened species under the Federal ESA on August 8, 1980 (50 Code of Federal Regulations 17.11). The beetle is dependent on its host plant, the elderberry (*Sambucus* spp.), which is a locally common component of the remaining riparian forests and savanna areas of the Central Valley. In most cases, the only evidence of the shrub's use by the beetle is an exit hole created by the larva

prior to the pupal stage. VELB larvae tend to be distributed in elderberry stems that are 1-inch or greater in diameter at ground level (USFWS, 1999).

Population densities of the beetle are most likely naturally low (USFWS, 1984). Studies suggest that, based on the spatial distribution of occupied shrubs, the beetle is a poor disperser (Barr, 1991). Low-density and limited dispersal capabilities cause the beetle to be vulnerable to the adverse effects from the isolation of small subpopulations due to habitat fragmentation. Moreover, once a small VELB population has been extirpated from an isolated habitat patch, the species could be unable to re-colonize the patch if it is unable to disperse from nearby occupied habitat (USFWS, 1999).

Five elderberry shrubs, all having stems greater than 1 inch in diameter at ground level, are located within 100 feet of the South Main Canal on the west and east banks. The *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (USFWS, 1999) provides measures to avoid and minimize adverse effects on VELB. Complete avoidance requires a minimum 100-foot buffer around elderberry plants with stems measuring 1 inch or greater at ground level. After the revision of the proposed action area boundary, the closest shrub to the revised construction staging area is approximately 350 feet away; therefore, no additional avoidance measures are required. CH2M HILL (2010a) prepared an elderberry survey technical memorandum for the proposed action area (see Appendix G).

California Tiger Salamander. Amphibian surveys were not conducted in the proposed action area. The CNDDB was reviewed for documented occurrences of CTS in Stanislaus and Tuolumne Counties. The nearest known CNDDB record is approximately 3 miles to the southwest. Suitable breeding habitat does not occur in the proposed action area of the tunnel portals or at the South Main Canal. However, there is continuity of suitable upland habitat between the proposed action area and the known CNDDB record to the southwest. Additionally, suitable aquatic breeding sites are within one mile of the two portal sites (within the known dispersal distance for CTS). Therefore, the likelihood that CTS occur near the site is high. Given the quality of habitat near the proposed action area, CTS could be present in the vernal pool complex upslope from the downstream portal and use the non native grasses found between the two portals including the 500- foot area that is Federal land.

U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW) representatives toured the action area during the initial planning phase to provide informal consultation on avoidance and minimization measures for the California tiger salamander (*Ambystoma californiense*) (CTS). A site visit was conducted on February 16, 2010, with the USFWS representative. On March 2, 2010, OID requested an informal consultation for the proposed action and submitted a Technical Memorandum on a Biological Site Review. Information was exchanged between OID and USFWS regarding the proposed action. OID proposed avoidance measures for special-status species to USFWS and submitted technical memorandums regarding an elderberry survey (elderberry bushes are located on private land on the section of canal that is no longer to be backfilled) and a rare plant survey for the portal areas conducted by CH2M HILL. In August 18, 2010, USFWS provided a concurrence letter for Oakdale Irrigation District's (OID) informal consultation for the Initial Study/Negative Declaration on effects to the CTS. USFWS proposed avoidance measures for special-status species in their August 18, 2010, letter, stating that the proposed avoidance measures committed to by OID are likely to avoid take of Federally listed species. CDFW also provided input on California tiger

salamander exclusion fencing and other minimization techniques that have been implemented in the downstream portal area to avoid take of state-listed species and the need to obtain an Incidental Take Permit. At that time, there was no Federal nexus, and Section 7 consultation was not required or warranted.

Distribution

California tiger salamanders are large salamanders, with adults frequently reaching 7.5 inches or more in total length. These are thick-bodied salamanders with broad heads and blunt snouts. Adults are black or dark grey, with oval to bar-shaped spots ranging in color from white to yellow. Juveniles are dark olive green in color and do not generally have any lighter markings. Larval tiger salamanders have external gills and are olive green in color, generally with very fine dark markings (stippling). Eggs are laid underwater singularly or in small groups, on subsurface portions of emergent vegetation or other debris. Each egg is approximately 0.5 to 0.75 of an inch in diameter, including a thick gelatinous layer. California tiger salamanders range from the eastern foothills of the Sierra Nevada, west to the outer coast range, from Sonoma and Yolo counties in the north, to Santa Barbara County in the south.

Habitat

The complex life cycle of California tiger salamanders necessitates that each individual use a mixture of habitats. Seasonal wetlands are used for reproduction. These wetlands need to retain water until May or June for successful reproduction to occur. By that time of year, the aquatic larvae should have matured to the extent that they can successfully metamorphose into the terrestrial juveniles. Occasionally, reservoirs (farm ponds) or the slow-moving portions of creeks are also used for reproduction. The juveniles and adults live in grasslands and oak woodlands, mainly living underground in the burrows of rodents. California tiger salamanders do occasionally inhabit landscaped areas.

Community Relationships and Behavior

Migrations from the uplands, where the adults live, to the seasonal wetlands, where they breed, generally start during the first runoff-causing rains of the season (usually mid-November to early December). Depending on the year and the timing of the rain, these nocturnal migrations can include a large number of salamanders, with several hundred adults migrating on a single night not being uncommon. Additionally, during years with little rain or only daytime rains, few, if any, salamanders would migrate. Migrations could consist of moves in excess of a kilometer, though most movements are less than 500 meters. Most movements occur on the surface, but it is probable that some dispersal occurs underground through rodent burrows. Movements by adults and juveniles from the breeding sites to the uplands are not well synchronized, and generally only a few at a time disperse from the seasonal ponds on rainy nights. Most male tiger salamanders are ready to start breeding when they are 3 years old; most females require an additional year to reach sexual maturity.

Aside from their migratory period, adult and juvenile tiger salamanders are rarely seen above ground. For most of the year, they live in the burrows of ground squirrels, gophers and other rodents in open wooded or grassy areas. Tiger salamanders are also frequently found under debris. Occasionally, tiger salamanders are found in man-made structures, including irrigation

control boxes, buildings, and drainage pipes. They are found on the surface during periods of damp weather, almost exclusively at night. California tiger salamanders do occasionally estivate (a summer dormancy period), but adult and juvenile salamanders can be observed at night, at the entrance of burrows, year-round.

Young (larvae) are aquatic and prefer the cover of vegetation to open water. Larvae are carnivorous and feed on anuran tadpoles and various aquatic invertebrates such as crustaceans, zooplankton, snails, and insect larvae. While the "cannibal morphs" found in the larvae of other species of tiger salamanders are apparently not present in California tiger salamanders, the adult salamanders would eat smaller members of the same species. These salamanders metamorphose into land-dwelling juveniles by May or June. After metamorphosis, the juvenile salamanders eat a wide variety of insects and other invertebrates. Juveniles generally remain near the breeding site until autumn rains, at which time they disperse to upland areas. Adult salamanders also eat a wide variety of insects and other invertebrates and are also large enough to include some small vertebrates (frogs, baby mice, etc.) in their diet.

Reasons for Decline

California tiger salamander populations have declined significantly in California. The main cause is fragmentation and destruction of habitat by agricultural and urban development. Introduced salamanders that hybridize with native tiger salamanders, could be a problem in some locations. Natural predators of tiger salamanders include herons, terns, raccoons, skunks, and snakes. Weather is a very important determinant of salamander reproductive success. In seasons with heavy, early rain, which trigger migration and reproduction, but when there is little or no mid- to late-season rain, many salamander larvae would not grow enough for successful metamorphosis and survival. Biocides and other environmental contaminants undoubtedly affect California tiger salamanders in some locations. Additionally, pathogens possibly pose a threat to some populations.

Existing Conditions

<u>Past and Present Effects of All Federal, State, or Private Actions, and Other Human Activities</u>

Within the project area of the proposed tunnel alignment and its associated staging areas, the past and present effects on the vegetation is from cattle grazing. It is estimated that approximately 50 to 75 head of cattle graze on private lands. At the South Main Canal, human activity is restricted to OID staff maintaining portions of the canal when it is destroyed by fallen rock. Human activities are limited where the tunnel would be constructed, since the majority of the proposed tunnel alignment and staging areas are on private land. In association with cattle grazing, the private landowner occasionally affects the area to round up their cattle, feed them, and mend cattle fences. Human activity seldom occurs on that 500-foot section of government property where the tunnel passes underground because it is far enough away from the river. Within the access road to be used for construction of the tunnel, the past effects of constructing the Two-Mile Bar road are disturbance to non-native grasses and shrubs when it was constructed for public access to the Two-Mile Bar Recreation Area. Human activity along Two-Mile Bar Road is limited to vehicles and pedestrians/ bicyclists who use the road for public access to the recreation area. A cyclone fence along the road prohibits recreation users from accessing the adjacent private lands.

In Stanislaus and Tuolumne Counties, there is designated critical habitat for the Central population of CTS in the project area, and thereby, there are potential effects to its critical habitat found on the surface on private land. Suitable breeding habitat does not occur in the proposed action area where the two portals are located. Suitable aquatic breeding sites are found at the vernal pools within one mile of the upstream and downstream portals of the tunnel (within the known dispersal distance of CTS) on private land. Although not optimal, suitable upland habitat consisting of non-native herbaceous vegetation is also found growing on private land and on 500 feet of U. S. Army Corps of Engineers' (Corps) Two-Mile Bar Recreation Area in the area between the two portals of the proposed tunnel. In addition to the oak and riparian forest habitats that are not preferred by CTS, OID's South Main Canal acts as a natural barrier to CTS migration restricting their range to the eastern side of the canal where the oak grassland savannah is found.

The proposed action area consists of nonnative grassland, mixed hardwood forests, oak woodlands including mixed oak forest, blue oak woodland, and cottonwood-willow riparian forest. In the northern portion of the proposed action area, the species present are characteristic of oak savannah: blue oak (*Quercus douglassii*) dominating the tree canopy and nonnative grasses including ripgut brome (*Bromus diandrus*), medusahead (*Taeniatherum caput-medusa*), wild oats (*Avena fatua*), and other annual non-native and native forbs dominating the understory.

In the central portion of the proposed action area adjacent to the South Main Canal, dominant plant communities on the western side include cottonwood-willow riparian forest and mixed oak forest. The riparian vegetation along the west side of the South Main Canal consists of arroyo willow *(Salix lasiolepis)*, red willow *(Salix laevigata),* and cottonwood (*Populus* spp.). The mixed oak forest vegetation consists of blue oak, canyon live oak (*Quercus chrysolepis*), coffeeberry (*Rhamnus californica*), mountain mahogany (*Cercocarpus betuloides*), toyon (*Heteromeles arbutifolia*), buckeye (*Aesculus glabra*), and manzanita (*Arctostaphylos glauca*). The eastern portion of the canal is dominated by blue oak woodland. The southern portion of the proposed action area is dominated by mixed oak forest on the western side and blue oak woodland on the eastern side of the canal. Along the top banks of the canal, scattered vegetation consists of low-growing forbs in a narrow band, including the following species: Italian rye (*Lolium multiflorum Lam.*), cudweed (*Gnaphalium* sp.), cockle burr *(Xanthium strumarium)*, dove weed (*Eremocarpus setigerus*), and curly dock (*Rumex crispus*).

California Red-legged Frog. Amphibian surveys were not conducted for the proposed action area. The CNDDB was reviewed for documented occurrences of California red-legged frog (*Rana aurora draytonii)*, a Federally listed threatened species in Stanislaus and Tuolumne Counties. The nearest known CNDDB records are approximately 35 miles to the northeast, near Sonora, and 37 miles to the southwest, near Newman. Suitable breeding habitat does not occur in the proposed action area because of fast-flowing canal water; steep, sloped banks that are several hundred feet high; and a noncontiguous shaded canopy (USFWS, 2002). In addition, there is a considerable distance between the proposed action area and the sites listed in the CNDDB. Therefore, California red-legged frog is not expected to occur on the site, and thereby, there are no effects.

San Joaquin Kit Fox. The CNDDB was reviewed for documented occurrences of San Joaquin kit fox (SJKF) (*Vulpes Macrotis*) in eastern Stanislaus County. The CNDDB currently includes occurrence records from the last 37 years that have been mapped into element occurrence

polygons that approximate occupied habitat. The CNDDB contains only one SJKF occurrence record from eastern Stanislaus County in the early 1970s. This occurrence is more than 23 miles east-southeast of the proposed action area. The CNDDB also contains SJKF occurrence records from western Stanislaus County, but the nearest recorded occurrence is more than 31 miles southwest of the proposed action area, near Patterson, California, in the early 1980s.

The review of the USFWS database for SJKF, which includes most of the CNDDB occurrence records, identified three additional SJKF occurrences in eastern Stanislaus County or adjacent areas that are not included in the CNDDB. These records include 2 occurrences approximately 1.0 mile south of La Grange (in 1972), 1 occurrence approximately 8 miles northwest of La Grange (in 1989), and 1 occurrence approximately 2 miles east of the Stanislaus–Tuolumne county line in western Tuolumne County (in 1989). None of these records is supported by a photograph, specimen, feces, hair, or carcass that can be used to verify the record. A biological records review and survey of the proposed action area conditions, along with the available distribution data, have resulted in the conclusion that SJKF have no potential to occupy the proposed action area or be adversely affected by the proposed action to issue OID right-of way and use Two-Mile Bar Road owned by the Corps for accessing the tunnel area and its features.

Special-status Plant Species. As stated in the July 2010 EIR, twenty-four special-status plant species could potentially occur in the proposed action area (California Native Plant Society, 2009). Approximately 8 of these special-status species are endemic to vernal pool habitats. The other 16 special-status species are known from cismontane woodlands and grassland habitats. Appendix D includes a list of special-status plant species with the potential to occur within the two counties.

A protocol-level rare plant survey was performed to determine if rare plants exist within the proposed action area. The initial survey did not identify any rare plants within the area of ground disturbance. The results of the rare plant survey were provided to the USFWS and CDFW. Multiple field visits were conducted between September 2009 and August 2010 during the appropriate blooming periods. On private land where the tunnel work would be conducted, no rare plants were observed at the staging areas or points of ingress and egress of the tunnel portals. CH2M HILL (2010b) prepared a rare plant survey technical memorandum was prepared for the proposed action (see Appendix F). Based upon this survey, the Federally listed and rare plants are not expected to be found at the two portals of the tunnel and the staging areas, and thereby, there are no effects.

3.2.6.2 Effects

Basis of Significance. Effects on special status species would be considered significant if an alternative would do any of the following:

- Adversely affect critical habitat
- Result in an unmitigated take of a special status species (Federally and state listed T&E species)
- Substantially affect a candidate species including degradation of its habitat
- Adversely affect a special status species

No Action. The No Action alternative would not have any adverse effects on Federally listed species, proposed or candidate species, or their habitat.

Proposed Action. Implementation of the proposed action would not result in a significant effect on a special-status wildlife, aquatic, or botanical resource with implementation of the following avoidance measures.

Valley Elderberry Longhorn Beetle. There is no designated critical habitat in the project area for the VELB, and thereby, there are no effects to its critical habitat. No elderberry shrubs would be removed as part of the proposed action including post-construction activities to maintain the mitigation oak plantings and no work would take place within 100 feet of an elderberry shrub (Figure 3-5). Based upon this design feature that avoids effects, there are no direct or indirect effects to the beetle and its habitat, and thereby, no Section 7 consultation and mitigation is required.

California Tiger Salamander. In Stanislaus and Tuolumne Counties, there is designated critical habitat for the Central population of CTS in the project area, and thereby, there are potential effects to its critical habitat. Suitable breeding habitat does not occur in the proposed action area where the two portals are located. Additionally, suitable aquatic breeding sites are found within one mile of the upstream and downstream portals of the tunnel (within the known dispersal distance of CTS). On private land, there is potential to may affect, but not adversely affect California tiger salamanders from the localized tunneling surface work at the portals due to the continuity of suitable upland habitat between the proposed action area and the known CNDDB record to the southwest. Therefore, the likelihood that CTS occur near the project site is high as it traverses between its aquatic and upland habitats found on private and Federal land. Given the quality of habitat near the proposed action area, CTS could be present in the vernal pool complex found upslope from the downstream portal. On private land, potential effects to the CTS in the upland area at the downstream portal have been reduced even less than what was previously disclosed in the CEQA document, since the location of the staging areas (Figure 1-3) have been moved further south away from the vernal pool complex found north of the portal. The August 18, 2010, USFWS concurrence letter for OID's informal consultation for the Initial Study/Negative Declaration on effects to the CTS is provided in Appendix E.

Direct Effects

In order to implement the preferred alternative selected by OID, the Corps would grant OID right-of-way permission to use Two-Mile Bar Road to access a section of the South Main Canal and construct a tunnel passing through underneath of 500 feet of Corps property. Based on this, there is now a Federal nexus that requires the Corps to conduct Section 7 consultation for this project where there are potential effects to CTS on that 500-foot section of the concrete tunnel crossing underneath Federal land at the Two-Mile Bar Recreation Area.

The proposed Two-Mile Bar Tunnel would be approximately 5,900 feet long with a circular circumference measuring 11.5 feet wide at the bottom and 13 feet high in the center. The concrete-lined tunnel would be constructed between 100 to 200 feet below the ground surface for most of its length while approximately 500 feet of the tunnel crosses underneath the surface of the land owned by the Corps. In the Corps' Biological Assessment, it was determined that issuing a right-of-way to OID to construct approximately 500 linear feet of the Corps' property at the Two-Mile

Bar Recreation Area, may potentially affect, but not adversely affect California tiger salamanders. On private land, the determination of effects by OID from the tunneling surface work and at the portals was based upon to the continuity of suitable upland habitat found between the proposed action area and the known CNDDB record to the southwest. The upstream portal of the proposed Two-Mile Bar Tunnel begins near the existing parking lot at the Two-Mile Bar Recreation Area and reconnected to the South Main Canal and the downstream (downslope) portal of the tunnel would reconnect to the existing canal about 1.1 mile downstream of the upstream portal.

On private land, it was determined by OID that there is no effect to vernal pool habitat for CTS or the vernal pool's associated plants and animals, since there is no surface work in that area or in close proximity to it (Figure 3-4). However, the likelihood that CTS inhabits the project site is high as it traverses between its aquatic found on private land and upland habitats found on both private and Federal land. Given the quality of breeding habitat near the proposed action area, CTS could be present in the vernal pool complex found further upslope from the downstream portal on private land. At the Corps' Two-Mile Bar Recreation Area, there is no effect to the vernal pools or to the more upland vegetation found on the surface where non-native herbaceous grows, since the tunnel excavation work occurs primarily between 100 to 200 feet underground. Except for the portals, this project has been designed to reduce the effects to non- native grasses and avoids vernal pools found on the surface. However, there are potential short term effects to burrowing salamanders from vibration and noise as the tunnel is excavated or from percussion effects if blasting is used. This potential effect particularly pertains to the area near the two portals where the tunnel excavation work is either at the surface (vibration) where the portals are or the work is underground in close proximity to the surface (vibration or blasting if used).

Based on more recent design and update to the project description, potential effects to the CTS in the upland area at the downstream portal have been reduced to less than what was previously disclosed in the August 2010 CEQA document and earlier consultation with OID, since the location of one of the staging areas have been moved further south away from the vernal pool complex found north of the downstream portal and in between the upstream portal.

Indirect Effects

Indirect effects to CTS could occur after the tunnel work is completed during tunnel maintenance activities at the Two-Mile Bar Recreation Area on the 500-foot section of the tunnel ranging between 100 to 200-feet underneath the surface of the Corps' property. In addition, disturbance, injury, or mortality could occur while OID is using Two-Mile Bar Road for access during maintenance activities. At the tunnel, these indirect effects that could disturb the burrowing CTS would be short-term and limited to vibration and noise from the equipment used for inspection and maintenance. Also, these same indirect effects could occur while OID is using the road as approximately one to four vehicles or heavy equipment are used during maintenance and repair activities to the tunnel if the CTS traverses the grasslands from the vernal pools to the road.

Note: **The downstream staging area has been moved further south than the location shown on the map (see Figure 1 for location).**

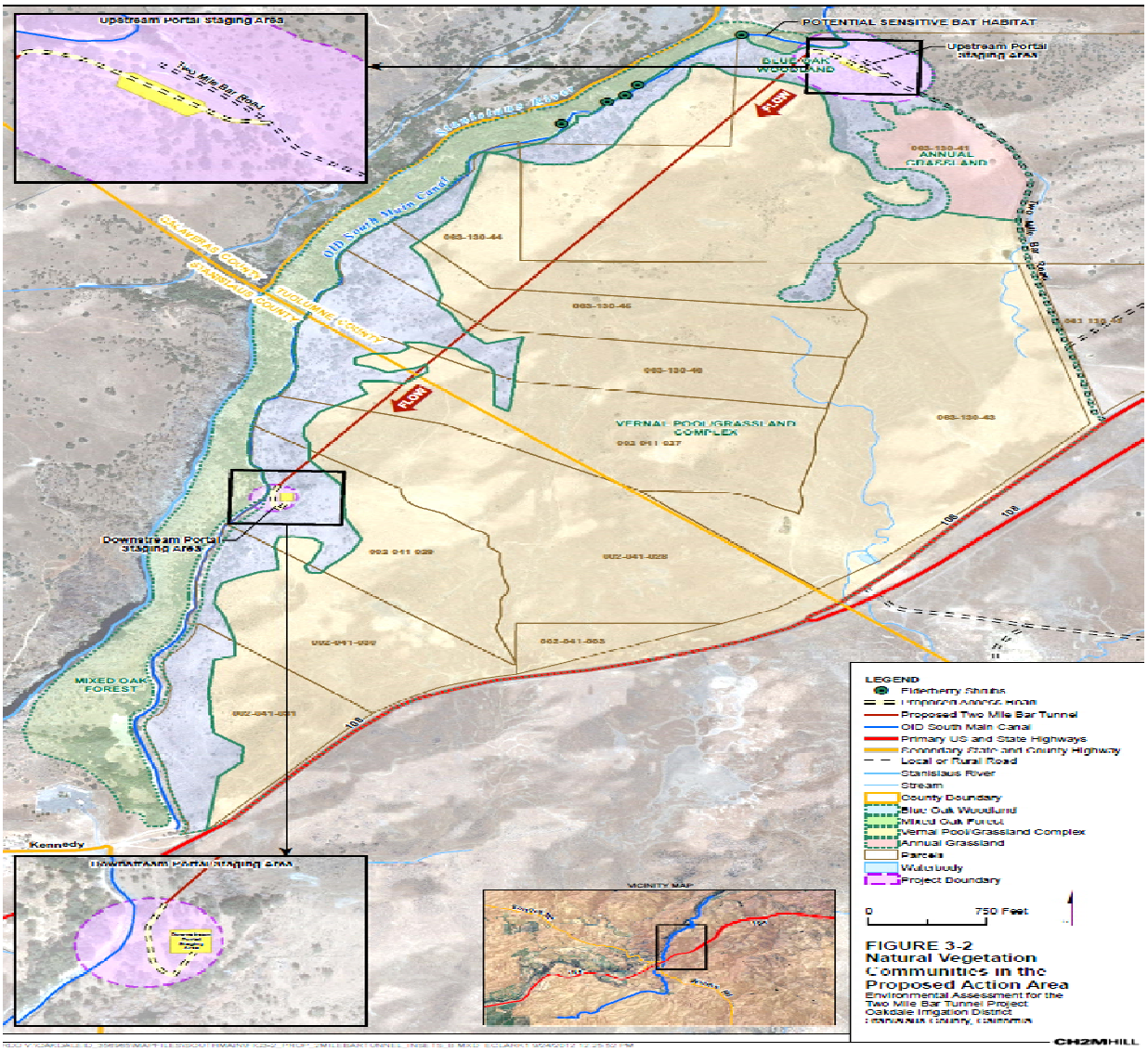

Figure 3-4. Location of Vernal Pool and Non-native Grassland Habitat Found Along the Tunnel Alignment and Five Blue Elderberries Found at the Two- Mile Bar Recreation Area/OID's South Main Canal.

Cumulative Effects

The proposed action to grant a right-of-way to OID for use of the Corps' Two-Mile Bar Recreation Area access road so it could construct, maintain, and access a 500-foot section of tunnel, would not result in the cumulative loss of aquatic or terrestrial habitat found on Federal land needed to support CTS. In combination with past and future canal repair or tunnel projects if implemented by OID, cumulative effects from the loss of grassland habitat or from noise and vibration could result in disturbing CTS when the canal or tunnel work is limited to where it is near the surface at the two portals during the period. This affect applies to when the CTS burrows in the soil or traverses between vernal pools and non-native grassland habitat. If OID or the Corps proposes other construction activities in the area in the future, the effects could result in the injury or loss

of salamanders and effects to its habitat if they were to cross the Two-Mile Bar Road. However, at this time, there are no other foreseeable projects proposed in the project area at the Two-Mile Bar Recreation Area.

3.2.6.3 Mitigation Measures

In identifying the location for the proposed tunnel, several mitigation measures were taken into consideration to reduce potential effects on sensitive special status species located near the proposed action area. The initial design configuration for the proposed action included several design and construction elements that would likely have caused potentially significant environmental effects resulting in the loss of vernal pool and upland habitats; however, OID refined the design and construction features (including access routes and actual construction footprint area) to reduce or eliminate some of these effects.

During the planning and design of the proposed action, the following Federal listed species were considered:

Potential effects on CTS

The following avoidance or minimization measures have been incorporated into the design for the proposed OID tunnel to reduce direct, indirect, and cumulative effects to sensitive species such as CTS to less than significant:

- The location of the south staging/laydown areas has now been moved south away from the downstream portal of the tunnel that further reduces and minimizes conflicts with associated construction activities that could potentially affect nearby vernal pools and upland habitat found approximately 700 feet to the north of the downstream portal.

- USFWS avoidance and minimization BMPs were incorporated into the proposed action to minimize potential CTS take during construction. In keeping with the measures proposed to USFWS, OID had installed and maintained a CTS exclusion fence at the downstream portal. The fence installation was completed by January 15, 2011, when CTS had left their burrows and entered the vernal pool complex. Prior to construction in 2015, the existing exclusion fence at the downstream portal would be inspected and repaired or replaced where necessary and a new exclusion fence would be constructed at the upstream portal as well until the tunnel construction and maintenance of the mitigation plantings are completed. The fence must remain installed for at least 1 year prior to construction. The CTS exclusion fence is protected by an electric fence to prevent cattle from damaging or trampling the fence. The fenced area includes the OID canal, which acts as a natural barrier to CTS migration on the western side of the proposed action area. A USFWS-approved biologist was onsite and supervised the installation to confirm that it met USFWS requirements; and a biologist would monitor the installation at the upstream portal until it is completed.

- A barbed wire fence would be installed by OID to prevent cattle from entering the upstream and downstream portals of the tunnel.

- Appropriate work time windows would be used to eliminate potential take of special-status bats.

After previous discussions OID had with USFWS and CDFW, OID would implement the following minimization and avoidance Best Management Practices (BMPs) to eliminate potential take of CTS in the proposed action area:

- OID had installed and would maintain a CTS exclusion fence at the downstream portal for at least 1 year prior to construction. The CTS exclusion fence would be protected by an electric fence to prevent cattle from damaging or trampling the CTS fence. The CTS fence was installed between December 15, 2011 and January 15, 2012 when CTS had left their burrows and entered the vernal pool complex. One year prior to construction, OID would also install a CTS exclusion electrical fence at the upstream portal. The OID canal acts as a natural barrier to CTS migration on the western side of the proposed action area, but, otherwise, the area would be fenced so that CTS are excluded. An USFWS-approved biologist assisted and monitored the fence to confirm that it meets USFWS requirements.

- A USFWS-approved biologist would conduct a training session for OID and its authorized agents prior to the start of construction that would include identification of CTS, actions to take if encountered, and discussion of all minimization BMPs in place.

- Daily visual clearance surveys would be conducted by a biological monitor during ground disturbing activities near the portals. If any CTS are unearthed or discovered in or near the work area, USFWS would be immediately notified. If USFWS approves moving the CTS, a USFWS-approved biologist would be allowed sufficient time to move the species from the work site before work activities resume. Only USFWS-approved biologists would participate in the capturing, handling, and translocation of CTS. Any CTS relocated because of the proposed action would be moved to nearby appropriate habitat, as determined by the USFWS-approved biologist and the USFWS.

- An erosion and sediment control plan would be implemented to limit effects of construction activities on habitat outside the work areas. Access routes, the number and size of staging areas, and work areas would be limited to the minimum size necessary to achieve the proposed action goals. Access roads would be clearly marked prior to construction or grading.

- All foods and food-related trash items generated from the proposed action would be enclosed in sealed trash containers at the end of each day and removed from the site every 3 days.

- A maximum speed limit of 10 miles per hour would be enforced for construction traffic in the proposed action area.

- All equipment would be maintained to prevent automotive fluid leaks, such as gasoline, oil, or solvent.

- Hazardous materials, such as fuel, oil, and solvent, would be stored in sealable containers in a designated location that is at least 100 feet from aquatic habitats.

All fueling, cement mixing, vehicle maintenance, and equipment and staging areas would be conducted in designated areas at least 100 feet from aquatic habitat.

- Temporary construction and staging areas that results in effects to vegetation on private land would be restored by planting at a 3:1 ratio over 0.1 acre of native blue oak woodland and seeding 4.2 acres of native grasses to reduce the effects to vegetation and CTS to be less than significant.

3.2.7 Cultural Resources

Cultural resources are defined as prehistoric or historical districts, sites, buildings, structures, or objects considered important to a culture, subculture, or community for scientific, traditional, religious, or other purposes. Cultural resources include archaeological resources, historical architectural or engineering resources, and other traditional resources.

Section 106 of the National Historic Preservation Act requires that Federal agencies to take into account the effects of their undertakings on historic properties, and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment. An historic property is defined as a prehistoric or historic cultural resource that has been determined to be eligible for listing in, or listed in the National Register of Historic Places (NRHP). The NRHP is the United States Federal government's official list of districts, sites, buildings, structures, and objects that are significant in American history, architecture, engineering, and culture. The NRHP is administered by the National Parks Service.

3.2.7.1 Existing Conditions

Records and Literature Search

A literature search of the California Historical Resources Information System at the Central California Information Center was conducted to identify potential recorded archaeological sites and known cultural resource survey and excavation reports. The NRHP, California Register, California Historical Landmarks, California Points of Historical Interest, and an 1853–1870 historical plat map for Township 1 South and Range 12 East were also examined. According to the available information (Brotherton, 1982), 1 cultural resource study was previously prepared for an area in the vicinity of the Proposed Action area. Aside from the historical South Main Canal, no other resources were identified as a result of that study.

The South Main Canal was investigated independently by Carey and Co., Inc (2007). The canal was determined to be ineligible for inclusion in the California Register of Historic Resources Information System or NRHP. Specifically, the canal was determined not eligible for listing because it lacks historical significance. The period of significance for this resource dates to 1912 when the canal was constructed. Although this canal is associated with the Wright Act and the expansion of public irrigation districts, it is not associated with the formation of the OID. Additionally, the canal represents an expansion of an existing irrigation system rather than construction of a new system. The canal is not particularly important to the development of

agriculture in the Oakdale area, because agriculture in the area was well established before the canal was constructed. Furthermore, the canal was not innovative in design or unique in construction and, therefore, was determined not eligible under NRHP Eligibility Criterion A or C. The canal is also not associated with any person of historical significance and lacks structural integrity because of extensive repair and modification (Carey and Co., Inc., 2007).

Overall, the canals and laterals in OID were determined ineligible for the NRHP by consensus through the Section 106 process in 2008 (Office of Historic Preservation, 2008). Although originally constructed between 1910 and 1913, none of the canals in OID, including the South Main Canal, retain integrity to this period. All canals within OID have been altered during normal OID operations. All canals have been deepened to increase water flow, thus altering their original geometry. Almost all of the original Joshua Hendy cast iron control gates have been refitted. In general, the canals retain their setting and run through open agricultural land as they did during their period of significance. However, this is not sufficient to determine the canals eligibility for the California Register of Historic Resources or NRHP (Herbert, 1994).

Field Reconnaissance Survey

In October 2009, CH2M HILL conducted a one-day reconnaissance visit to the South Main Canal to generally characterize the Proposed Action area identified in the EIR for the tunnel and to visually examine the canal. The canal was found to be as described in the Carey and Co., Inc., Department of Parks and Recreation site forms. No updates were made to the Department of Parks and Recreation forms. A Cultural Resources Assessment was prepared for the Proposed Action (Lawson 2012).

3.2.7.2 Effects

Basis of Significance. An alternative would be considered to have an adverse effect on cultural resources if the proposed action would diminish the integrity of the criteria that formulate the resource's value as an historic property. Adverse effects include physical destruction, damage, or alteration; isolation or alteration of the character of the setting; introduction of elements that are out of character; neglect; and transfer, lease, or sale.

The NRHP criteria for evaluation (36 CFR 60.4) are the quality of significance in American history, architecture, archaeology, engineering, and culture in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and:

- That are associated with events that have made a significant contribution to the broad patterns of our history;
- That are associated with the lives of persons significant in our past;
- That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components could lack individual distinction; or

- That have yielded, or could be likely to yield, information important in prehistory or history.

No Action. This alternative would have no effect on existing cultural resources in the proposed action area because current conditions would remain unaltered.

Proposed Action. The proposed action is to grant access for OID onto Corps property for its tunnel construction activities occurring on private land. Effects from construction involves ground disturbance at the tunnel portals and at depths below expected cultural levels. Additionally, OID would not backfill the old canal segment. Alterations to the canal would be limited to blocking or sectioning off the canal and tying it back in to the tunnel to prevent uninterrupted flows to downstream users. Because of the lack of significant historical resources within the proposed action area and the depth of excavation, the preferred alternative to grant OID access onto the Corps' property is not anticipated to have direct, indirect, or cumulative effects on cultural resources. The areas around the proposed action have been previously disturbed by the excavation, construction, and maintenance of the South Main Canal, and potential effects on unknown resources are not anticipated. As previously mentioned, the new tunnel would be excavated at a depth of 100 to 200 feet, which is below expected cultural levels.

3.2.7.3 Mitigation Measures

Although the probability of discovering cultural resources is low, lack of surface evidence of archaeological artifacts does not mean they do not exist in the area. If cultural resources are encountered during construction, all activity within 60 feet of the find would cease until it can be evaluated by a qualified archaeologist and a Corps archaeologist. If the qualified archaeologist and a Corps archaeologist determine that the resources could be significant, pursuant to 36 CFR 800.13(b) Discoveries without prior planning, the Corps would then ensure the development of approved plan to evaluate significance of the resource(s). Additional investigations could be required to mitigate adverse effects from project implementation. This could include avoidance or subsurface excavation.

There is no record of human remains in the proposed action area. If human remains are encountered during construction, California Health and Safety Code Section 7050.5 states that no further disturbance would occur until the county coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. The county coroner would be notified of the find immediately along with notifying a Corps archaeologist. If the remains are determined to be Native American, the county coroner will notify the Native American Heritage Commission (NAHC), which would determine and notify an individual known as the most likely descendant (MLD). With the permission of the landowner, or his or her authorized representative, the MLD could inspect the site of the discovery. The MLD would complete the inspection within 48 hours of notification by the NAHC. The MLD would provide a recommendation for the disposition of the human remains.

3.2.8 Noise

Noise is unwanted or undesirable stationary, transient, intermittent, or continuous sound produced by any activity or device. Noise can cause a disruption of normal activities or cause the quality of physical and emotional health and the over-all quality of life to diminish. The most

frequent standard of measuring sound is the A-weighted decibel scale, which measures frequencies that can be heard by the human ear. Noise levels recorded using the dB Leq unit of measure represent the average noise levels over a 24-hour period. Noise levels recorded using the dB Ldn unit of measure represent the average noise over a 1-hour period.

3.2.8.1 Existing Conditions

Noise Sources. The primary existing sources of noise in the proposed action area are associated with motor vehicles, human activities, and natural sounds (e.g., wind and moving water). Vehicles currently use the roadways within the proposed action area to access the Two-Mile Bar Recreation Area.

Sensitive Receptors. Sensitive receptors include those humans and wildlife that could be affected by changes in noise types or levels due to construction activity. Sensitive receptors would include visitors to the Two-Mile Bar Recreation Area.

3.2.8.2 Effects

Basis of Significance. The proposed action would have a significant effect if it would substantially increase the ambient noise levels for adjoining areas. The significance of short-term noise effects is evaluated with reference to existing noise levels, the duration of the noise, and the number of sensitive receptors affected by construction.

No Action. This alternative would not have any adverse effects on existing noise in the proposed action area. Current noise sources and levels would be expected to remain the same.

Proposed Action. There are no nearby houses or businesses near the construction footprint of the tunnel or mitigation planting area. Construction activities from the proposed action, such as the mechanical clearing and grubbing of vegetation, transportation and placement of fill, underground drilling and blasting, and mitigation planting activities would temporarily increase the noise levels near the action area. Daytime recreational users within the Two-Mile Bar Recreation Area could temporarily experience increased noise levels. However, temporary construction activities are not expected to significantly adversely affect sensitive receptors in the proposed action area. Considering this localized type of tunnel blasting is well below the surface in the ground and confined to the tunnel area, there would be no surface disturbance, and the noise and vibration associated with the blasting would be less than background noise from surface construction activities.

Indirect Effects

After construction of the tunnel is completed, there are potential indirect effects on noise to recreation users of the Stanislaus River Park and wildlife during the tunnel maintenance and mitigation planting activities. The limited number of vehicles used during post construction and implementation of BMPs would reduce the effect to less than significant.

3.2.8.3 Mitigation Measures

The proposed action is to issue OID right-of- way access onto the Corps' property. This access, which is needed for the tunnel construction activities, would not create noise levels that exceed standards or permanent noise that exceeds ambient levels because there are few sensitive receptors located near the proposed action area and because of the temporary nature of the construction activities. The following BMP would be implemented to reduce the temporary effect to noise to be less than significant:

- All construction equipment would be properly maintained and equipped with noise controls, such as mufflers, in accordance with manufactures' specifications.

3.2.9 Traffic

Transportation and traffic resources generally include the roadway and street systems in the affected environment. This section also considers the movement of vehicles and pedestrian and bicycle traffic. Due to the rural environment where it is open space, there is no mass transit.

3.2.9.1 Existing Conditions

Traffic Types and Volume. The access route to the upstream portal will be via the existing Two-Mile Bar Road from SR 120/108. This road is a cul-de-sac that ends in a parking lot owned and operated by the Corps' Stanislaus River Parks. The current OID right-of-way to access their existing facilities will be amended and include the new activities identified in this EA. The Two-Mile Bar Recreation Area includes several day-use facilities that provide public access to the river.

The construction access route to the downstream portal would be via SR 120/108 to Kennedy Road, to an access road that follows the same route as the Main Canal. Figures 1-3 and 1-4 show the access routes to the upstream and downstream portals.

SR 120/108 is considered a Class A expressway, which is a fully access-controlled road with grade-separated interchanges at intervals of approximately 1.0 mile at other expressways, major roads, or local roads (Stanislaus County, 2010b). SR 120/108 is an important east-west link for travelers destined for the recreation centers of the Sierra Nevada Mountains. In the area of the proposed action, Kennedy Road, Two-Mile Bar Road, and SR 120/108 all operate at a Level of Service (LOS) of "C" or better. In Stanislaus County, the LOS standard for all roadways is "C" or better (Stanislaus County, 2010b).

3.2.9.2 Effects

Basis of Significance. Factors considered in determining whether a significant traffic-related effect could occur include the extent to which the proposed action would result in any of the following:

- An increase in vehicle trips that would disrupt or alter local circulation patterns

- Lane closures or other traffic impediments

- Activities that would create potential traffic safety hazards or impede emergency access
- Increased conflict with pedestrian paths, bicycle routes, or fixed-route transit
- Parking demand that exceeds the supply

No Action. This alternative would not have adverse effects on existing traffic in or near the proposed action area. The mix and volume of traffic would remain the same in the vicinity.

Proposed Action. By granting OID right-of way access onto the Corps' property, public access at the site would not be closed during construction. Under OID's oversight, the contractor would create an access and laydown area adjacent to the existing parking lot where trucks and equipment would be staged. The existing paved road would only be used to travel to and from SR 108/120.

There would be a slight temporary increase in local traffic on SR 120 and SR 108, Kennedy Road, and Two-Mile Bar Road during the construction period. This increase would be caused by mobilization and demobilization of equipment and construction workers entering and exiting the site and general construction traffic, such as dump trucks working at the site. Table 3-6 provides the estimated number of construction truck trips during construction of the proposed action, which will last approximately 18 to 24 months. This increase in traffic would be temporary and would not reduce the LOS to a level below "C." Therefore, this effect is considered less than significant.

TABLE 3-6
Construction Truck Trips

Activity	Vehicle	Truck Trips
Hauling Tunnel Spoils	Dump truck	1,900
Hauling Concrete	Concrete transit truck	350
Mobilizing and Demobilizing	Various	100
Hauling Construction Materials	Various	100

Indirect Effects

After the tunnel is constructed, foot or vehicle traffic during the plant establishment, maintenance, and monitoring activities could result in potential temporary indirect effects to traffic. The effect would be avoided or reduced to less than significant with the limited use of one or two vehicles needed for these activities and implementation of BMPs provided in Section 3.9.3.

3.2.9.3 Mitigation Measures

Implementation of the proposed issuance of right-of-way to OID is needed. Access is needed for construction of the tunnel and canal tie-ins by OID, which is not expected to have a significant direct or indirect effect on local traffic volumes. To minimize effects on traffic flow onto Two-

Mile Bar Road and access leading into the Two-Mile Bar Recreation Area, the contractor would use flagmen to control traffic and speed limit signs when needed and install post construction warning signs along the access route from SR 120/108. In addition, flaggers would be instructed to immediately allow emergency responders to access the river at all times.

3.2.10 Hazardous, Toxic, and Radiological Waste

This section describes the affected environment associated with hazardous materials used or stored in the proposed action area. The term "hazardous material" refers to any item or agent (biological, chemical, or physical) that has the potential to harm humans, animals, or the environment, either by itself or through interaction with other factors.

Issues associated with hazardous materials typically involve waste streams; underground and aboveground storage tanks; and the storage, transport, use, and disposal of pesticides, fuels, lubricants, and other industrial substances. When these materials are improperly used, they could threaten the health and well-being of wildlife, habitat, soil and water systems, and humans.

3.2.10.1 Existing Conditions

The proposed issuance of granting OID right-of-way to access where the tunnel and staging areas are constructed on private land is in a rural, open area that does not appear to be affected by hazardous, toxic, or radiological waste. There are no known hazardous material spill sites within 0.5 mile of the proposed action area and there are no known plugged or abandoned oil or gas wells within the proposed action area (EPA, 2012; DOC, 2012).

3.2.10.2 Effects

Basis of Significance. An alternative is considered to create a significant hazard if it causes any of the following:

- A significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials
- 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
- Hazardous emissions or if it uses hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing sensitive receptor
- Exposes people or structures to a significant risk of loss, injury, or death

No Action. This alternative would not have any adverse effects due to hazardous materials within the proposed action area.

Proposed Action. A minor amount of hazardous waste, if any, is anticipated to be generated by construction activities on private land in relation to implementation of granting OID access onto the Corps' property. However, hazardous materials (e.g., gasoline, oil, and lubricants) used

during construction could potentially be released. This effect is considered less than significant because of the small amount of these materials that would be used during construction. Additionally, the project SWPPP would include BMPs to control and contain potential releases of hazardous materials. Implementation of these BMPs would ensure any potential effect is less than significant.

Indirect Effects

After the tunnel is constructed, vehicle and equipment used during the plant establishment, maintenance, and monitoring activities could result in potential indirect effects by releasing hazardous and toxic waste into the environment. The effect would be avoided or reduced to less than significant with the limited use of one or two vehicles and equipment and implementation of BMPs provided below.

3.2.10.3 Mitigation Measures

While implementing the proposed action to issue right-of-way to OID for accessing and tunneling under the Corps' property, construction activities are not expected to have a significant adverse effect due to hazardous, toxic, or radiological waste. To minimize potential effects, BMPs would include, but not be limited to, the following measures:

- Any hazardous materials generated during construction would be contained and sealed during work activities, except during filling. Waste containers would be placed in a designated covered hazardous waste storage area with an impermeable bottom surface surrounded by secondary containment to minimize the mixing of waste with stormwater and to prevent the direct release of liquid waste to stormwater drainage facilities. Waste containers would be constructed of a suitable material and properly labeled according to regulations. Temporary storage and removal of hazardous wastes from the site would be performed in accordance with all applicable state and Federal laws.

- Certified licensed companies would clean up large spills and dispose of contaminated materials.

- If the contractor stores onsite an aggregate volume greater than 1,320 U.S. gallons of petroleum-based products (e.g., diesel, gasoline, oil, and hydraulic fluid), in aboveground tanks that are 55-gallons or larger (including operational equipment), the contractor would prepare a spill prevention control and countermeasures plan.

- Covered storage would be provided for hazardous materials (e.g., pesticides, detergents, fuels, oil, grease, glue, paint, solvents, and curing compound materials). The storage area would have an impermeable bottom surface surrounded by secondary containment having 1.5 times the volume of the stored material. Containment areas would have room between containers for emergency response and cleanup. Storage areas would be regularly inspected to monitor inventory and check for leaking containers.

- All contractors and subcontractors would be trained in proper materials handling, storage, application, and delivery procedures.

- Spill cleanup materials, material safety data sheets, a materials inventory, and emergency contact numbers would be maintained and stored onsite.

- Information on proper storage and cleanup/spill reports would be posted at a visible and accessible location at all times.

- Manufacturers' recommendations for application, storage, and disposal of materials would be followed.

- Drip pans or absorbent pads would be used for vehicle and equipment maintenance activities that involve grease, oil, solvent, or other vehicle fluids.

- Spill cleanup kits would be available in fueling areas and fueling trucks.

- Construction equipment would be inspected daily for leaks. If external oil and grease need to be removed from equipment, it would be steam cleaned and the effluent disposed of offsite.

- If a previously unknown hazardous waste site is encountered during construction, the waste would be removed by a certified hazardous waste collection company and either recycled or deposited in a Class I landfill in full compliance with all applicable laws, ordinances, and regulations, including those of the California Department of Toxic Substances Control.

4.0 CUMULATIVE EFFECTS

Cumulative effects are those past and present effects of the proposed action considered with other relevant past, present, or reasonably foreseeable projects in the area. The potential effects of the proposed action on the environmental resources are discussed in the previous sections. Potential future projects in the area are too speculative and uncertain, and therefore, are not considered reasonably foreseeable for purposes of this cumulative effects analysis.

In combination with past projects in the immediate area of the proposed tunnel such as: 1) the construction related effects associated with the Corps' Two-Mile Bar Recreation Area and OID's South Main Canal and 2) current and/or future effects associated with public visitation and maintenance of the recreation area and OID periodically maintaining the new canal tie-ins and the tunnel, 3) the proposed action to grant OID right of way permission to access and construct the tunnel on Corps land and to access the portion of the canal to be blocked or sectioned off would result in cumulative effects on air quality, water quality traffic, vegetation and wildlife, special status species, recreation, cultural resources, and noise. The proposed action to grant right-of-way permission for OID to access Federal land (Two-Mile Bar Recreation Area and Two-Mile Bar Road) currently owned in fee title by the Corps is needed. Granting right-of-way access would allow OID to: 1) construct and maintain the Two-Mile Bar Tunnel and 2) block and re-divert the water from a section of the South Main Canal no longer used would not result in the cumulative loss of aquatic or terrestrial habitat found on Federal land needed to support CTS. However, the effects from underground vibration or blasting between 100 to 200 feet underneath the surface on the Corps' property could result in cumulative effects that disturb CTS in association with past construction vibration and noise effects when the Two-Mile Bar Road was constructed earlier. In combination with past and future canal repair or tunnel projects if implemented by OID, cumulative effects from the loss of grassland habitat on private or Federal land and/or from construction noise and vibration could result in disturbing CTS when the tunnel work is near the surface during the period when the CTS burrows in the soil or traverses between vernal pools and non-native grassland habitat.

There are no anticipated significant cumulative effects to the other environmental resources including cultural resources. OID would compensate for the adverse effects of losing up to 16 blue oaks providing habitat for many wildlife species by planting 48 oak seedlings over 0.1 acre on private land. In addition, OID would also implement BMPs to reduce or minimize the effects to the other affected environmental resources discussed earlier in this document to reduce the effects to less than significant. Therefore, when the permanent and temporary effects resulting from the proposed action to grant OID right of way permission for access to Federal land so it can construct the tunnel and access the canal are considered with past and, present projects in the vicinity, there are no significant cumulative effects identified at this time.

5.0 COMPLIANCE WITH ENVIRONMENTAL LAWS and REGULATIONS

Clean Air Act, as Amended and recodified (42 United States Code [U.S.C.] 7401 et seq.) *Compliance is pending.* The proposed action is not expected to violate any Federal air quality standards and would not hinder the attainment of air quality objectives in the San Joaquin Valley Air Basin and Mountain Counties Air Basin due to temporary work, limitation of types of equipment to be used, and the implementation of BMPs.

Clean Water Act (33 U.S.C. 1251 et seq.) *Full Compliance* . The proposed action does not involve the placement of fill in wetlands or waters of the U.S. so no 404 permit is required.

Endangered Species Act (16 U.S.C. 1531 et seq.) *Compliance is pending*. USFWS provided an updated list of special status species that could be affected by the proposed action (see Appendix E). After implementation of the avoidance measures proposed in Section 3.6.2, the Corps has determined the proposed action may affect the CTS, but does not adversely affect this species. There are no effects to other listed species discussed in this EA. The Corps has prepared a Biological Assessment for the CTS and is currently conducting Section 7 consultation with the USFWS for the tunnel work crossing under Federal land

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. *Compliance.* This order directs all Federal agencies to identify and address adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. There would be no effects on minority or low-income populations.

Fish and Wildlife Coordination Act (FWCA)(16 U.S.C. 661, et seq.) *Compliance is pending*. This Act applies to any Federal project where the waters of any stream or other body of water are impounded, diverted, deepened, or otherwise modified. Project proponents are required to consult with USFWS and the appropriate state agency. This agency prepares reports and recommendations that document project effects on fish and wildlife and identify measures that could be adopted to prevent loss or damage to flora and fauna resources.

During the public review period, USFWS would be provided the opportunity for input as described in the FWCA. Section 2(a) of the FWCA established that preconstruction planning on project development shall be coordinated with the USFWS. Furthermore, Section 2(b) of the FWCA provides the authorization for the USFWS to conduct surveys and investigations to determine the possible damage of proposed developments on wildlife resources, and to make recommendations to the construction agency that set forth means and measures to prevent the loss of or damage to wildlife resources, as well as to provide concurrently for the development and improvement of such resources.

Farmland Protection Policy Act (7 U.S.C. 4201 et seq.) Full *Compliance*. Soils types within the proposed action area are not classified as prime or unique farmland, and the existing land uses are non-agricultural (NRCS, 2009).

Migratory Bird Treaty Act, as amended (16 U.S.C. 703 et seq.) *Compliance is pending*. The construction would have no effect on riparian habitat including wetlands and vernal pools and only disturb 0.1 acre of oak woodland habitat supporting migratory birds in the proposed action

area. To avoid any potential effects on nesting migratory bird species or significant effects to migratory bird habitat, construction of the proposed action would occur outside of nesting seasons to minimize the effect and mitigate for the effects of losing blue oaks from construction by planting 0.1 acre of oaks and seeding 4.2 acres with native grasses.

National Environmental Policy Act (42 U.S.C. 4321 et seq.) *Compliance is pending.* This draft EA is in partial compliance with this Act. Appropriate public comments received during the 30-day public review period would be incorporated into the EA and it is expected to be adequately addressed. Submittal of the EA for public review and either the signed Finding of No Significant Impact (FONSI) or finding of Need to Prepare an Environmental Impact Statement would complete the NEPA process and fully comply with this Act.

National Historic Preservation Act of 1966, as amended (16 U.S.C. 470 et seq.). *Compliance is pending*. The National Historic Preservation Act is intended to preserve historical and archaeological sites in the United States. The act created the NRHP, the list of National Historic Landmarks, and the State Historic Preservation Offices. Section 106 of this act requires Federal agencies to take into account the effects of all Federally funded or permitted projects on historic properties (i.e. cultural resources that are eligible for inclusion in the NRHP). The Corps will consult with the State Historic Preservation Officer and interested Native American tribes on a finding of *no historic properties affected* (36 CFR 800.4[d][1]).

6.0 POTENTIAL FEDERAL, STATE, and LOCAL PERMITS NEEDED

OID would obtain any and all necessary environmental and construction permits to support construction of the proposed action to grant OID right-of-way. Permits could be required from the following agencies:

Central Valley Regional Water Quality Control Board: The Water Board issues permits for activities that could cause effects to surface waters and groundwater, including the effects resulting from construction activities. The Water Board requires that a NPDES permit be obtained if pollutants would be discharged to surface water. OID would ensure that the construction contractor would prepare a SWPPP and obtain the waste discharge permit prior to construction.

County of Stanislaus Planning and Community Development Department: OID would obtain an encroachment permit from Stanislaus County for construction access on Sonora Road.

Upon agency consultation, OID has determined that the following permits would not be required:

San Joaquin Valley Air Pollution Control District: SJVAPCD has jurisdiction over any potential effects to air quality within the Proposed Action area. Project-specific emissions of criteria pollutants are not expected to exceed SJVAPCD significance thresholds or result in an increase in capacity or activity. Therefore, in correspondence dated July 12, 2010, (see Appendix B) the SJVAPCD concluded that Rule 9510 (Indirect Source Review) requirements and related fees do not apply to the proposed action.

U.S. Fish and Wildlife Service: USFWS met with OID and toured the proposed action area in February 2010. OID prepared and submitted a biological technical memorandum to USFWS with a request for informal consultation. OID submitted a proposed list of avoidance measures that would prevent the potential take of CTS. OID received a letter of concurrence from USFWS on August 20, 2010 (see Appendix E). Coordination and consultation for the CTS between the USFWS and the Corps for granting OID permission to use and access Federal land to do the tunnel work underground on Federal land is ongoing with no permit required.

California Department of Fish and Game: CDFW has jurisdiction over state-listed species and any potential take of these species. The recent listing of the CTS required that CDFW concur with any decision made by the USFWS as to potential effects to CTS. OID coordinated with CDFW to gain concurrence with USFWS regarding CTS. No CDFW permits would be required.

7.0 COORDINATION and REVIEW of the ENVIRONMENTAL ASSESSMENT

The draft EA may be announced through local media venues and would be circulated for 30 days to agencies, organizations, and individuals known to have an interest in the proposed action for their review. All comments received would be considered, addressed, and incorporated into the final EA, as appropriate. The proposed action is being coordinated with all relevant government resources agencies including the USFWS, CDFW, NRCS, EPA, SJVAPCD, Central Valley Regional Water Quality Control Board, Caltrans, and the California State Historic Preservation Office.

Agency correspondence and consultations include the following:

- OID conducted an initial meeting and site visit with Maryann Owens/USFWS on February 16, 2010, which focused on potential effects to Federally protected species and their habitat.

- OID completed the rare plant surveys that began in spring 2010. The results of the surveys indicate that no rare or threatened plants occur within the proposed action area (see Appendix F). The results of the rare plant surveys have been sent to USFWS and CDFW.

- Results from initial biological field surveys and site visits have been forwarded to the USFWS, and OID's informal consultation for the VELB seeking guidance and concurrence from the USFWS on proposed avoidance measures was completed.

- OID worked with the USFWS to obtain concurrence on CTS avoidance measures, including the use of an exclusion fence for the small area of disturbance near the downstream portal. During this time, OID also consulted with CDFW on the use of an exclusion fence. OID obtained final acceptance of this approach from the USFWS (see Appendix E for USFWS letter of concurrence, dated August 20, 2010) and were forwarded the exclusionary fencing design to Jim Vang/CDFW.

- The Corps is conducting Section 7 consultation with the USFWS and their letter of concurrence is pending.

- Preconstruction bird and bat surveys would be performed as necessary, and results of preconstruction surveys would be forwarded to the USFWS and CDFW.

- The Corps is coordinating with the Tribes and conducting Section 106 consultation with SHPO and their letter of concurrence is pending.

8.0 CONCLUSIONS

On the basis of the information presented in this EA, the preferred alternative is for the Corps to grant OID right-of-way permission for the use and access of Federal land at the Two-Mile Bar Recreation Area and Two-Mile Bar Road. Granting access is needed so OID could 1) construct the Two-Mile Bar Tunnel and for the continuous conveyance of irrigation water in the existing South Main Canal after a section of it on Federal property is blocked or sectioned off, as well as 2) OID conducting its maintenance activities for the new tunnel and mitigation plantings. Implementing the preferred alternative could result in direct, indirect, and cumulative effects to environmental resources. However, implementing the preferred alternative consisting of granting OID right-of-way permission to construct the tunnel and access Federal land would not result in an effect to land use and recreation on Federal land managed by the Corps or delivery of irrigation water to downstream users once the section of the canal is blocked or sectioned off. Furthermore, it would not result in significant direct, indirect, and cumulative effects to the other environmental resources including cultural resources evaluated in this EA. Potential adverse effects were evaluated in detail for the following environmental resources: water resources, supplies, and water quality, air quality, vegetation and wildlife, Federally and state listed special status species, cultural resources and historic properties, noise, traffic, and hazardous, toxic, and radiological waste.

Regarding the potential effects to Federally listed threatened species such as the California tiger salamander, it was determined that there may be an effect, but there are no adverse or significant effects to this salamander on that 500-foot section crossing of the Corps' Two-Mile Bar Recreation Area and at Two-Mile Bar Road. As addressed in the mitigation section for threatened and endangered species, the new location of the south staging/laydown areas and BMPs would be used and implemented by OID to reduce and minimize the potential direct, indirect, and cumulative effects to CTS. To avoid, reduce, and minimize effects to CTS and their critical habitat, OID has requested that the Corps grant a right-of-way to OID for the use of the existing Two-Mile Bar Recreation Area access road (Two-Mile Bar Road) and to construct and maintain a 500-foot section of tunnel, located between 100 to 200 feet underneath the surface of the Corps' property. In doing so, OID would be avoiding significant adverse effects to CTS and its critical habitat. There would be no loss of breeding or upland habitats found on Federal land at the Two-Mile Bar Recreation Area, but there may be minimal to no disturbance to burrowing CTS during underground excavation or blasting of the tunnel if it is used instead of excavation. At Two-Mile Bar Road, the potential effects from construction vehicles and worker vehicles using it for access would be avoided by OID installing or repairing the exclusion fence to prevent disturbance to the CTS and its upland grassland habitat or causing accidental injury or mortality.

The proposed action granting OID access onto the Corps' property could also cause indirect effects during post construction tunnel maintenance activities as some of the same excavation equipment could be used and contribute to cumulative effects to CTS. OID would implement Best Management Practices it coordinated earlier with OID and CDFW as included in the Corps' BA. It would also include installation of the CTS exclusion fence at the upstream portal, as well as repairing or replacing the one that was installed earlier at the downstream portal. OID has also agreed, as a part of their separate undertaking, to restore lost upland habitat at the portals and northernmost staging area by planting 4.2 acres of native grasses on the disturbed private land once construction of the tunnel is completed.

Based on this information presented in this EA and the design considerations and BMPs that would be used by OID to reduce the direct, indirect, and cumulative effects to sensitive species, the Corps has determined that the proposed action to issue OID right-of-way for use of the existing Two-Mile Bar Recreation Area access road (Two-Mile Bar Road) so OID could construct and maintain a 500-foot section of tunnel, located between 100 to 200 feet underneath the surface of the Corps' property may affect, but is not likely to adversely affect the California tiger salamander (Central California DPS) and/or its critical habitat. Subsequently, by design, there are no significant adverse effects.

On private land, there are no effects to the valley elderberry longhorn beetle because no elderberry shrubs would be affected at the canal based upon the location of the tunnel and canal tie-in activities being more than 100 feet away from the nearest elderberry shrub. In addition, it was determined that there are no permanent effects to cultural and historic properties (the blocked or sectioned off section of the South Main Canal) based upon field observations and a records search. The adverse direct, indirect, and cumulative effects to vegetation and wildlife resulting from implementing the proposed action would require OID to plant and maintain in perpetuity 0.1 acre of blue oaks and seeding 4.2 acres of native grasses to compensate and mitigate for the adverse effects. Once the tunnel is completed, the potential short term effects to OID's canal would be compensated by allowing uninterrupted flow in the canal to continue with the tie-in work with the new tunnel and portals to the canal. In addition, there is no mitigation beyond avoidance, implementation of BMPs/measures, and timing of construction as proposed in this EA to compensate for the direct, indirect, and cumulative effects to the other environmental resources including recreation at Two-Mile Bar Recreation Area. Based on the design, OID's planting mitigation, and use of BMPS, there are no significant effects to the resources resulting from the Corps issuing OID right-of-way to use Two-Mile Bar Road as access to Federal land at the Two-Mile Bar Recreation Area.

After the public review period, a determination would be made on whether or not a FONSI is warranted or if the preparation of an Environmental Impact Statement is necessary. The proposed issuance of right-of-way from the Corps so OID could use Two-Mile Bar Road as access and construct a 500 foot section of tunnel is not expected to result in significant effects. The right-of-way is needed so OID could construct its tunnel and tie-ins from the canal to the tunnel and conduct maintenance of the tunnel after construction. In adequately addressing public comments, it is expected to meet the NEPA requirements for analyzing the effects of the proposed action to grant OID a right-of- way access and allow the signing of a FONSI, as described in 40 Code of Federal Regulations 1508.13.

9.0 LIST of PREPARERS

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Appendix A

Two-Mile Bar Tunnel Project
Site Photos

PHOTOGRAPH 1

View of the area near the proposed upstream portal staging area. A portion of the approximate 2-acre proposed staging area is seen on the left side of photograph. Photograph taken from the north end of Two-Mile Bar Road in a northwesterly direction.
September 21, 2009

PHOTOGRAPH 2

A portion of the proposed 2-acre upstream portal staging area. Photograph taken from the north end of Two-Mile Bar Road in a southwesterly direction.
September 21, 2009

PHOTOGRAPH 3

Canal location of the proposed upstream portal. Photograph taken from the north end of Two-Mile Bar Road in a northwesterly direction.
September 21, 2009

PHOTOGRAPH 4

Photograph shows typical blue oak woodland in the proposed 2-acre upstream portal staging area. Photograph taken in a southwesterly direction.
September 21, 2009

PHOTOGRAPH 5

Photograph shows typical oak savannah/grasslands in the proposed 5-acre upstream portal staging area. Photograph taken in a southerly direction.
September 21, 2009

PHOTOGRAPH 6

One of the culverts under Two-Mile Bar Road in the proposed 5-acre upstream portal staging area. Photograph taken in an easterly direction.
September 21, 2009

PHOTOGRAPH 7

Roadside ditch on southwestern side of Two-Mile Bar Road and small, seasonal drainage leading from the proposed 5-acre upstream portal staging area. Photograph taken in a southerly direction.
September 21, 2009

PHOTOGRAPH 8

Stock pond located west of Two-Mile Bar Road. The pond will not be directly impacted by the Project; however, it might provide suitable habitat for California tiger salamander. Photograph taken in a southwesterly direction.
September 21, 2009

PHOTOGRAPH 9

Canal and proposed 2-acre downstream portal and staging area. Photograph taken from the west bank of the canal in a northeasterly direction.
September 21, 2009

PHOTOGRAPH 10

One of two small, seasonal drainages on the east side of the canal near the proposed 2-acre downstream portal and staging area. Photograph taken from the west bank of the canal in a northeasterly direction.
September 21, 2009

PHOTOGRAPH 11

Photograph shows typical blue oak woodland in the proposed 2-acre downstream portal and staging area. Photograph taken from the west bank of the canal in an easterly direction.
September 21, 2009

PHOTOGRAPH 12

Photograph shows cliff near the north-central portion of the canal proposed to be filled following completion of the proposed tunnel. Photograph taken from the west bank of the canal in an easterly direction.
September 21, 2009

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Appendix B

San Joaquin Air Pollution Control District Letter

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San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

HEALTHY AIR LIVING™

July 12, 2010

Steve Knell, P.E.
Oakdale Irrigation District
1205 East "F" Street
Oakdale, CA 95361

Project: Two Mile Bar Tunnel Project

District CEQA Reference No: 20100395

Dear Mr. Knell:

The San Joaquin Valley Unified Air Pollution Control District (District) has reviewed the project referenced above consisting of the construction/excavation of a tunnel to replace a portion of the Oakdale Irrigation District South Main Canal that has a high risk hazard due to potential rock fall from above, starting near the Two Mile Bar Recreation parking lot in Tuolumne County (APN 063-130-41) and ending in the existing South Main Canal in Stanislaus County (APN 002-041-029), approximately 12 miles east of the City of Oakdale, CA. The District offers the following comments:

1. Based on information provided to the District, project specific emissions of criteria pollutants are not expected to exceed District significance thresholds of 10 tons/year NOX, 10 ton/year ROG, and 15 tons/year PM10. Therefore, the District concludes that project specific criteria pollutant emissions would have no significant adverse impact on air quality.

2. Based on information provided to the District, the proposed project would not result in an increase in capacity or activity. Therefore, District Rule 9510 (Indirect Source Review) requirements and related fees do not apply to the project referenced above. The District appreciates Oakdale Irrigation District's commitment to mitigating construction emissions and encourages the use of construction equipment that can achieve reduction in NOx emissions as indicated in the Initial Study.

3. The proposed project may be subject to District Rules and Regulations, including: Regulation VIII (Fugitive PM10 Prohibitions), Rule 4102 (Nuisance), Rule 4601 (Architectural Coatings), and Rule 4641 (Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations). In the event an existing building will be renovated, partially demolished or removed, the project may be subject to District

Seyed Sadredin
Executive Director/Air Pollution Control Officer

Northern Region
4800 Enterprise Way
Modesto, CA 95356-8718
Tel: (209) 557-6400 FAX: (209) 557-6475

Central Region (Main Office)
1990 E. Gettysburg Avenue
Fresno, CA 93726-0244
Tel: (559) 230-6000 FAX: (559) 230-6061

Southern Region
34946 Flyover Court
Bakersfield, CA 93308-9725
Tel: 661-392-5500 FAX: 661-392-5585

www.valleyair.org www.healthyairliving.com

Rule 4002 (National Emission Standards for Hazardous Air Pollutants). The above list of rules is neither exhaustive nor exclusive. To identify other District rules or regulations that apply to this project or to obtain information about District permit requirements, the applicant is strongly encouraged to contact the District's Small Business Assistance Office at (559) 230-5888. Current District rules can be found online at: www.valleyair.org/rules/1ruleslist.htm.

If you have any questions or require further information, please call Patia Siong at (559) 230-5930.

Sincerely,

David Warner
Director of Permit Services

for Arnaud Marjollet
Permit Services Manager

DW: ps

Cc: File

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Appendix C

Biological Site Review

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Biological Site Review for Two-Mile Bar Tunnel Project

PREPARED FOR: Maryann Owens/U.S. Fish and Wildlife Service

PREPARED BY: Oakdale Irrigation District
CH2M HILL

DATE: March 1, 2010

Introduction

This technical memorandum identifies potential biological constraints/issues associated with ground-disturbing activities related to the proposed construction of the Oakdale Irrigation District (OID) Two-Mile Bar Tunnel Project (Project). This information is based on a preliminary site assessment conducted on September 21, 2009, review of aerial photographs, California Natural Diversity Database (CNDDB) results, U.S. Fish and Wildlife (USFWS) species lists, historical documents related to this Project, and an initial meeting/site visit by Maryann Owens on February 16, 2010.

Project Purpose

The open canal sections of the South Main Canal in this area are at the highest risk for catastrophic failure in the entire system because of the existing rock overhangs and the dry, stacked rock used on the downslope canal embankment during the original construction.

Historically, large boulders have fallen from the steep slopes above this area and destroyed sections of the canal, causing significant water loss and interruption in service. Each time this occurs, emergency measures are undertaken to restore the canal. The *Oakdale Irrigation District Water Resources Plan* (CH2M HILL, 2005) identified this area as a very high risk area for failure and recommended that a new tunnel be built around this particular section of canal to eliminate potential catastrophe.

Project Summary

OID is proposing to build a new tunnel that will address the highest risk area. The upstream portal of the proposed Two-Mile Bar Tunnel begins near the parking lot at Two-Mile Bar Road and reconnects to the existing canal about 1 mile downstream. The proposed tunnel will be approximately 5,860 feet long with a horseshoe-shape cross section measuring 10.5 feet wide at the bottom and 14 feet high in the center. The tunnel will be approximately 200 feet deep (below the ground surface) for the majority of its 1-mile length.

Avoidance and Minimization of Biological Impacts

OID has been working on various aspects of this Project for nearly a decade. The following primary biological issues were considered:

- Potential impacts on California tiger salamander (CTS)
- Potential impacts on valley elderberry longhorn beetle (VELB)
- Potential impacts on threatened species of bats
- Removal of various oak trees near the portals

Other potential biological impacts have been considered as described in the following sections. Impacts to other resources (cultural resources, traffic, and air quality) have been analyzed and mitigated in the California Environmental Quality Act document that will be sent to the State Clearinghouse in March/April 2010.

The initial design configuration for the Project included several design and construction elements that would likely have caused potentially significant environmental impacts. OID was able to redesign or eliminate nearly all of these impacts by implementing the following changes to the Project:

- The haul roads that would have involved significant fill in the vernal pool complex, potential take of CTS, and impacts on vernal pool species and possibly rare plants were all eliminated. Instead, an alternative access will be used through OID's existing right-of-way from the southwestern side of the Project area.

- Initial laydown areas and stockpile areas were eliminated from the vernal pool complex and downsized to fit into an area that can be fenced to prevent potential CTS take.

- The downstream portal staging area was downsized such that it is completely contained within the natural "bowl" area. The downstream portal staging area will not have any significant hydraulic/hydrologic impact on any of the vernal pools that exist above on the plateau (e.g., the vernal pool complex).

- VELB impacts were minimized by changing the design to prevent the direct take of any elderberry bushes. No elderberry shrubs will need to be removed from the canal bank, and USFWS-approved protective fencing and signs will protect the host elderberry from any permanent damage.

- Appropriate work windows will be used to eliminate any potential take of VELB or special-status bats.

- The project was re-engineered to eliminate the need for vents along the new tunnel alignment. The tunnel vents would have required significant impacts on the vernal pool complex and possibly CTS and other listed species. Therefore, the tunnel was redesigned such that tunnel vents are no longer needed to relieve backpressure within the tunnel walls. This measure added significant cost to the tunnel excavation, but resulted in complete avoidance of impacts along the tunnel alignment (e.g., vernal pool complex).

- The upstream portal access roads were narrowed and realigned to minimize oak tree impacts near the upstream portal.

- USFWS avoidance and minimization best management practices (BMP) were incorporated into the Project to prevent any CTS take during construction.
- A protocol-level rare plant survey is underway to ensure that no rare plants exist within the Project impact area. The initial survey did not show any rare plants within the area of ground disturbance. If any rare plants are discovered, USFWS will be consulted; and a removal, transplant, or mitigation plan will be implemented prior to any ground-disturbing activities.

Site Location

The Project is located approximately 12 miles northeast of Oakdale, California. The site is located along the South Main Canal from Kennedy Road to Two-Mile Bar Road, between approximately 37° 50′ 23.19″ N, 121°38′ 23.12″ W; and 37° 49′ 35.74″ N, 121°39′ 09.14″ W. The Project is in Township 1 South, Range 12 East, sections 21 and 22, of the Mount Diablo meridian, Stanislaus and Tuolumne Counties, California.

Survey Methods

The site survey was conducted on September 21, 2009, between 9:00 a.m. and 5:00 p.m. Air temperatures were between 80 and 95 degrees Fahrenheit during the survey. Wind speed was negligible throughout the day with clear skies. The site was systematically evaluated on foot throughout the Project area. Photographs taken during the site survey are provided in Attachment 1. The CNDDB results (Figure 1) and associated information, and the USFWS species lists are provided in Attachment 2.

Results

Flora

The Project area consists of nonnative grassland and mixed hardwood forests and oak woodlands including mixed oak forest, cottonwood-willow riparian forest, and blue oak woodland. In the northern portion of the Project area, species found to be present are characteristic of oak savannah: blue oak *(Quercus douglassii)* dominating the tree canopy and nonnative grasses dominating the understory including ripgut brome *(Bromus diandrus)*, medusahead (*Taeniatherum caput-medusa*), wild oats (*Avena fatua*), and other annual forbs.

In the central portion of the Project area adjacent to the South Main Canal, dominant communities on the western side include cottonwood-willow riparian forest and mixed oak forest. The riparian vegetation along the west side of the South Main Canal consists of arroyo willow *(Salix lasiolepis)*, red willow *(Salix laevigata),* and cottonwood (*Populus* spp.). The mixed oak forest vegetation consists of blue oak, canyon live oak (*Quercus chrysolepis*), coffeeberry (*Rhamnus californica*), mountain mahogany (*Cercocarpus betuloides*), toyon (*Heteromeles arbutifolia*), buckeye (*Aesculus glabra*), and manzanita (*Arctostaphylos glauca*). The eastern portion of the canal is dominated by blue oak woodland.

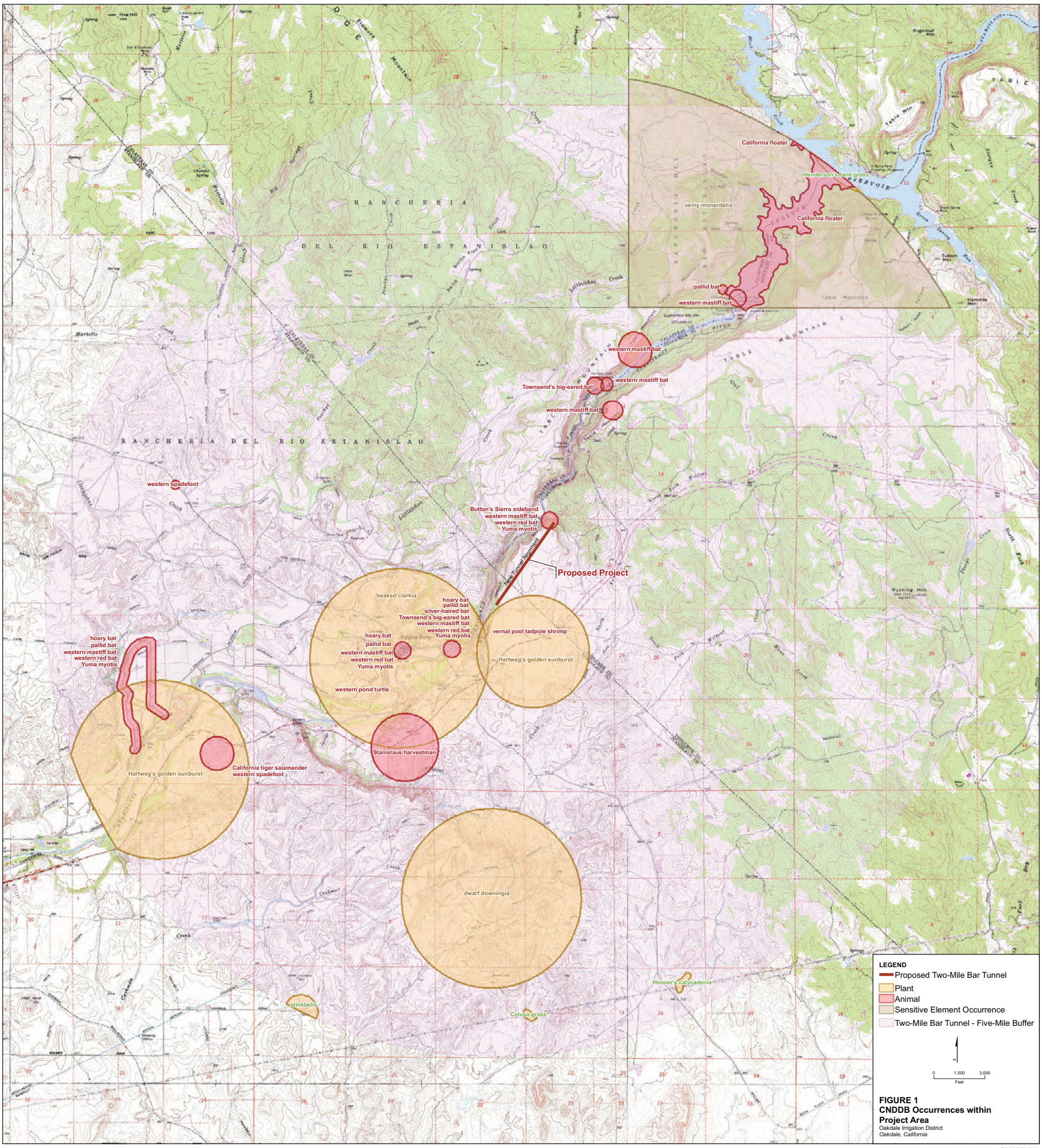

FIGURE 1
CNDDB Occurrences within Project Area
Oakdale Irrigation District
Oakdale, California

The southern portion of the Project area is dominated by mixed oak forest on the western side and blue oak woodland on the eastern side of the canal. Along the top banks of the canal, scattered vegetation consists of low-growing forbs in a narrow band, including the following species: Italian rye (*Lolium multiflorum Lam.*), cudweed (*Gnaphalium* sp.), cockle burr *(Xanthium strumarium)*, dove weed (*Eremocarpus setigerus*), and curly dock (*Rumex crispus*). Plant species identified during the site visit are provided in Attachment 3.

Sensitive Habitats

Wetlands

A wetlands assessment was conducted on September 21, 2009, concurrent with the preliminary biological survey effort. Jurisdictional wetlands were not observed in or adjacent to the Project area. A 404 Permit will not be required from the U.S. Army Corps of Engineers. Additionally, activities associated with the OID South Main Canal system are exempt from a 404 Permit under U.S. Army Corps of Engineers RGL 07-02.

Vernal Pools

Vernal pool habitat was not observed within the Project boundaries. However, vernal pools are located within approximately 750 feet (including a 250-foot buffer) of the proposed staging areas for both the upstream and downstream portals. Extensive avoidance and minimization efforts, including redesign of certain project elements, will ensure that there is no impact to the vernal pool complex (see previous sections). The new tunnel will be approximately 200 feet below the vernal pool complex so that there is no potential to impact the hydrology of overlying soils.

Oak Woodlands and Other Native Hardwood Habitats

The northern portion of the Project site, located within Tuolumne County, is dominated by blue oak woodlands (Figure 2). In the central and southern portions, located within Stanislaus County, mixed oak forest and blue oak woodlands dominate the Project area (Figure 2). Both counties recognize these habitats as sensitive resources. The *Tuolumne County General Plan* outlines within the Scenic Resource Section 4.1.3: "to conserve the natural scenic quality of hillsides and hilltops throughout Tuolumne County" and to:

> "Formulate and maintain a program to retain existing significant vegetation, such as Heritage Trees, stands of oak woodlands, or clusters of native shrubs, which contributes to defining the County's character, within new development requiring a discretionary entitlement subject to the California Environmental Quality Act through incentives. Revegetation on programs may be required for premature vegetation removal." (Section 4.l.k) (Tuolumne County Board of Supervisors, 1996).

In addition, Goal 1 in the *Stanislaus County General Plan* outlines a strategy to encourage the protection and preservation of natural and scenic areas throughout the county (Stanislaus County, Department of Planning and Community Development, 1996).

Upstream Portal Staging Area

Two-Mile Bar Road

0 50 100
Feet

POTENTIAL SENSITIVE BAT HABITAT

MIXED OAK FOREST

Upstream Portal Staging Area

FLOW

Stanislaus River

BLUE OAK WOODLAND

COTTONWOOD-WILLOW RIPARIAN FOREST

063-130-41

NONNATIVE GRASSLAND

INTERMIXED COTTONWOOD-WILLOW RIPARIAN FOREST

OID South Main Canal

Two-Mile Bar Road

CALAVERAS COUNTY

STANISLAUS COUNTY

063-130-44

063-130-45

MIXED OAK FOREST

TUOLUMNE COUNTY

063-130-46

063-130-43

FLOW

VERNAL POOL/GRASSLAND COMPLEX

002-041-027

BLUE OAK WOODLAND

002-041-028

Downstream Portal Staging Area

002-041-029

108

002-041-030

002-041-003

002-041-031

MIXED OAK FOREST

Kennedy

Kennedy

Willms

OID South Main Canal

Downstream Portal Staging Area

Downstream Portal Staging Area

VICINITY MAP

Sonora Rd

108

108

Willms Rd

LEGEND

- Elderberry Shrubs
- Proposed Access Road
- Proposed Two-Mile Bar Tunnel
- OID South Main Canal
- Primary US and State Highways
- Secondary State and County Highway
- Local or Rural Road
- Stanislaus River
- Stream
- County Boundary
- Blue Oak Woodland
- Cottonwood-Willow Riparian Forest
- Intermixed Cottonwood-Willow Riparian Forest
- Mixed Oak Forest
- Nonnative Grassland
- Vernal Pool/Grassland Complex
- Parcels
- Waterbody
- Project Boundary

N

0 175 350
Feet

FIGURE 2
Habitat Map
Oakdale Irrigation District
Oakdale, California

Policy 4 of Goal 1 states: "Protect and enhance oak woodlands and other native hardwood habitat." Implementation Measure 1 requires:

> "All discretionary projects that will potentially impact oak woodlands and other native hardwood habitats, including but not limited to hardwood rangelands identified in the maps in Appendix III-A, to include a management plan for the protection and enhancement of oak woodlands and other native hardwood habitat." (Stanislaus County, Department of Planning and Community Development, 1996).

After the final Project description is complete, an evaluation of oak tree impacts will need to be completed and a final mitigation plan implemented as determined necessary. At this time, it appears that alterations to the Project laydown areas could be implemented to eliminate most of the oak tree impacts.

Cottonwood-Willow Riparian Forest

Cottonwood-willow riparian forest is also found within the Project area (Figure 2). This community occurs within the central portion of the Project site along the western bank of the South Main Canal, which is part of the riparian canopy of the Stanislaus River. At this time, it does not appear that a permit will be required from California Department of Fish and Game (CDFG).

Rare Plants

Twenty-four special-status plant species could potentially occur in the Project area (California Native Plant Society, 2009). Approximately eight of these special-status species are endemic to vernal pool habitats. The other 16 special-status species are known from cismontane woodlands and grassland habitats. During the September 21, 2009 field visit, no rare plants were observed. However, the Project area was found to support suitable cismontane woodland and grassland habitats that might harbor special-status plant species. Therefore, rare plant surveys in 2010, during the appropriate blooming periods are recommended prior to construction. Attachment 2 provides a list of special-status plant species with the potential to occur within the Project area.

Fauna

Fauna species observed were those found in blue oak woodland, mixed oak forest, nonnative grasslands, and riparian habitats. The species were identified by direct observation, tracks, burrows, nests, or scat. Species included raccoon *(Procyon lotor)*, mule deer *(Odocoileus hemionus),* grey fox (*Urocyon cinereoargenteus),* western scrub jay (*Aphelocoma californica*), white-breasted nuthatch (*Sitta carolinensis),* great horned owl (*Bubo virginianus),* and turkey vulture *(Cathartes aura).* A complete list of species observed during the site visit is provided in Attachment 3.

Special-status Species

Valley Elderberry Longhorn Beetle

Five elderberry shrubs, all having stems greater than 1.0 inch in diameter at ground level, are located within 100 feet of the South Main Canal on both the west and east banks. The VELB, a federally threatened species, is completely dependent on elderberry shrubs for survival. The USFWS 1999 *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* provides measures to avoid and minimize adverse effects to VELB. Complete avoidance

requires a 100-foot minimum buffer around elderberry plants with stems measuring 1.0 inch or greater at ground level.

OID has proposed the following minimization efforts to avoid impacts on VELB:

- No elderberry bushes will be removed.
- Under the guidance of the biological monitor, the contractor will install orange exclusion fencing and required signs around each elderberry shrub in accordance with 1999 USFWS guidelines.
- A minimum buffer of 8 to 20 feet will be maintained from the dripline, and elderberry shrubs will be watered to remove any dust that accumulates on the leaves during construction.
- A USFWS-approved biologist will be onsite whenever ground-breaking activities occur within 20 feet of an elderberry shrub. The biologist will have the capability to halt construction as needed to protect VELB.
- No insecticides, herbicides, fertilizers, or other chemicals that might harm the beetle or its host plant will be used within 100 feet of any elderberry plant.

Fishery Resources

Special-status aquatic fish species are not expected to occur in the Project area and will not be impacted by the Project.

Vernal Pool Crustaceans

Vernal pool habitat was not observed within the Project boundaries; therefore, vernal pool crustaceans do not occur in the Project area. The vernal pool complex that exists on the plateau above the tunnel portals will not be impacted by the Project.

California Tiger Salamander

Amphibian surveys were not conducted for the Project area. The CNDDB was reviewed for documented occurrences of CTS in Stanislaus and Tuolumne Counties. The nearest known CNDDB record is approximately 3.0 miles to the southwest. Suitable breeding habitat does not occur on the Project site. However, there is continuity of the suitable upland habitat between the Project area and the known CNDDB record to the southwest. Additionally, suitable aquatic breeding sites are within less than 1.0 mile of the site (within the known dispersal distance of CTS). Therefore, the likelihood that CTS occur near the site is high. Given the quality of habitat near the Project area, CTS could be present in the vernal pool complex.

Following discussions with USFWS, OID is proposing the following minimization and avoidance BMPs to eliminate potential take of CTS in the Project area:

- OID will install and maintain, for at least 1 year prior to construction, a CTS exclusion fence (e.g., silt fence). The CTS exclusion fence will be protected by an electric fence to prevent cattle from damaging or trampling the fence. The fence will be installed between December 15 and January 31 when CTS will have left their burrows and entered the

vernal pool complex. The OID Canal acts as a natural barrier to CTS migration on the western side of the Project, but, otherwise, the Project area will be fenced to ensure that CTS are excluded from the Project area. A USFWS-approved biologist will assist as needed in the installation to ensure it meets USFWS requirements.

- A USFWS-approved biologist will conduct a training session for OID and its authorized agents prior to the start of construction that will include identification of CTS, actions to take if encountered, and discussion of all minimization BMPs in place.
- Daily visual clearance surveys will be conducted by a biological monitor during ground-disturbing activities near the portals. If any CTS were unearthed or discovered in or near the work area, USFWS would be immediately notified. If USFWS approves moving salamander(s), a USFWS-approved biologist will be allowed sufficient time to move the species from the work site before work activities resume. Only USFWS-approved biologists will participate in the capturing, handling, and translocation of CTS. Any CTS relocated because of the Project will be moved to nearby appropriate habitat, as determined by the qualified biologist and USFWS.
- An erosion and sediment control plan will be implemented to prevent impacts of construction on habitat outside of the work areas. Access routes, number and size of staging areas, and work areas will be limited to the minimum necessary to achieve the Project goals. Access roads will be clearly marked prior to initiating construction/grading.
- All foods and food-related trash items will be enclosed in sealed trash containers at the end of each day and removed from the site every 3 days.
- No pets will be brought onto the Project site.
- No more than a maximum speed limit of 25 miles per hour will be permitted within the Project site boundary. All equipment will be maintained such that no automotive fluid leaks, such as gasoline, oils, or solvents, will occur. Hazardous materials such as fuels, oils, and solvents will be stored in sealable containers in a designated location that is at least 200 feet from aquatic habitats. All fueling and maintenance of vehicles and other equipment and staging areas will occur at least 200 feet from any aquatic habitat.

California Red-legged Frog

Amphibian surveys were not conducted for the Project area. The CNDDB was reviewed for documented occurrences of California red-legged frog (*Rana aurora draytonii)*, a federally listed threatened species, in Stanislaus and Tuolumne Counties. The nearest known CNDDB records are approximately 35 miles to the northeast, near Sonora, and 37 miles to the southwest, near Newman. Suitable breeding habitat does not occur on the Project site because of fast-flowing canal waters; steep, sloped banks that are several hundred feet high; and noncontiguous shaded canopy. In addition, a considerable amount of distance is between the Project area and the known CNDDB records. Therefore, California red-legged frog is not expected to occur on the site.

San Joaquin Kit Fox

The CNDDB was reviewed for documented occurrences of San Joaquin kit fox (SJKF) (*Vulpes Macrotis*) in eastern Stanislaus County. The CNDDB currently includes occurrence records from the last 37 years that have been mapped into element occurrence polygons that approximate occupied habitat. The CNDDB contains only one SJKF occurrence record from eastern Stanislaus County in the early 1970s. This occurrence is more than 23 miles east-southeast of the Project area. The CNDDB also contains SJKF occurrence records from western Stanislaus County, but the nearest of these occurrence records is more than 31 miles southwest of the Project area, near Patterson, California, in the early 1980s.

Review of USFWS's SJKF database, which includes most of the CNDDB occurrence records, identified three additional SJKF occurrence records from eastern Stanislaus County or adjacent areas that are not included in the CNDDB. These records include two individuals approximately 1 mile south of La Grange (in 1972), one individual approximately 8 miles northwest of La Grange (in 1989), and one individual approximately 2 miles east of the Stanislaus/Tuolumne County line in western Tuolumne County (in 1989). Each of these latter SJKF occurrence records are not supported by a photograph, specimen, feces, hair, or carcass that can be used to verify the record. A biological records review and survey of the Project site conditions, along with the available distribution data, have resulted in the conclusion that SJKF have no potential to occupy the Project site or be adversely affected by the Project.

Raptors and Migratory Birds

The Project area was inspected for raptors and migratory birds, and suitable nesting habitat. During the field visit, several raptor and migratory bird species were observed; because the surveys occurred after the breeding season, no active nests were observed. However, several nest sites were identified along the rock cliffs adjacent to the South Main Canal. Two large stick nests and one platform scrape nest were observed on the cliff face. These nests could be attributed to cliff-dwelling raptors such as prairie or peregrine falcons (*Falco mexicanus* or *F. peregrinus*), respectively, or could be associated with corvids such as ravens or crows. These nest sites had recent white wash, indicating use during the recent breeding season. A small colony of about 20 white-throated swifts *(Aeronautes saxatalis)* was also observed using the cliff faces. This species nests in the cracks and crevices and ledges of cliff faces. Swallow nests were also observed in various locations in the same general areas. Attachment 3 provides a list of avian species observed. The entire Project area has potential to support nesting birds during the breeding season. If construction begins during the non-nesting season (September 1 through February 14) so as to assure that no nests would be established, no preconstruction surveys are required. The onsite biological monitor will continue to monitor for any nesting activities near the site.

Roosting Bats

Although three state-listed bat species are known to occur within or in proximity to the Project area, no roost sites have been documented in the Project area (CNDDB, 2006). Therefore, the Project area was reviewed for potential roosting bats and suitable roosting habitat during the reconnaissance survey. During the field visit, roosting bats were not observed in or adjacent to the Project area, but the entire Project site supports suitable foraging habitats for bat species because it occurs along the Stanislaus River corridor.

During the reconnaissance survey, team members determined that a follow-up survey should be conducted by a biologist more versed in bat biology. The follow-up survey was conducted on October 26, 2009, to determine where suitable bat roosting sites and potential construction-related impacts could occur. Several suitable roosting sites occur along or within the Project site; these sites occur to the north along the cliff faces near the upstream portal and along the northern section of the South Main Canal. Migrant bat species occur in the area between April and September. If construction begins between October 1 and February 28 (non-breeding season) so as to assure no roosts would be established, no preconstruction surveys would be required. The onsite biological monitor will continue to monitor for any roosting activities near the site.

Conclusion

Avoidance and minimization efforts have reduced the overall footprint of the Project to a level that will not result in take of any listed species. The Project has been redesigned and engineered such that the overall footprint will not impact any potential waters of the United States or waters of the State. OID has concluded that formal consultation is neither warranted nor required for the Two-Mile Bar Tunnel Project and that the mitigation measures and avoidance BMPs described herein will serve to adequately protect any listed species that might have had some potential take within the vicinity of the Project area.

Request for Concurrence

OID hosted a meeting and site visit with Maryann Owens/USFWS on February 16, 2010, to discuss the proposed minimization and avoidance measures. The USFWS has recommended an informal consultation for the Project that will ultimately result in a letter of concurrence. A concurrent process will also be initiated with CDFG regarding any potential concerns that CDFG might have related to the pending state listing of CTS.

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Appendix D

Special Status Plant and Animal Table

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Special-status Plants and Animals Table

TABLE B-1
Special-status Plant and Animal Species Reported near the Proposed Two Mile Bar Tunnel Project Area
Oakdale Irrigation District

Scientific Name	Common Name	Federal/ State/CNPS Status	Habitat Requirements	Present/Breeding–Nesting–Bloom Season	Potential for Species within Project Area
Birds					
Agelaius tricolor	tricolored black bird	-/SC	Breeds near fresh water, preferably in emergent wetlands, with tall, dense cattails or tules, but also in thickets of willow, blackberry, wild rose, and tall herbs. Feeds in grassland and cropland habitats.	February – May	Unlikely – no suitable nesting habitat is in the Project vicinity; suitable foraging habitat is present.
Athene cunicularia	burrowing owl	-/SC	Occurs in open, dry grassland and desert habitats, and in grass, forb, and open shrub stages of pinyon-juniper and ponderosa pine habitats.	Resident/March – August	Unlikely – no suitable nesting habitat is in the Project vicinity; suitable foraging habitat is present.
Eremophila alpestris actia	California horned lark	-/SC	California horned larks are considered the inland valley form adapted to mesic environments. This species occupies open country with low or sparse vegetation. Nests in grasslands, salt marshes, and deserts.	April – June	Moderate – suitable nesting and foraging habitat is present.
Icteria virens	yellow-breasted chat	-/SC	Uses riparian thickets of willow and other brushy tangles near watercourses for cover. Frequents dense, brushy thickets and tangles near water and thick understory in riparian woodland.	May – July	Moderate – suitable nesting and foraging habitat is present along riparian corridor.

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Oakdale Irrigation District

Scientific Name	Common Name	Federal/ State/CNPS Status	Habitat Requirements	Present/Breeding–Nesting–Bloom Season	Potential for Species within Project Area
Mammals					
Antrozous pallidus	Pallid bat	-/SC	Grasslands, shrublands, woodlands, and forests from sea level up through mixed conifers. Rocky areas with caves or tunnels. Occasionally inhabit old buildings.	February – June	Moderate – suitable habitat present along cliff faces. Suitable foraging habitat found throughout Project site.
Corynorhinus townsendii	Townsend's big-eared bat	-/SC	Lives in a variety of communities, including coastal conifer and broadleaf forests, oak and conifer woodlands, arid grasslands and deserts, and high-elevation forests and meadows. Known roost sites include limestone caves, lava tubes, mine tunnels, buildings, and other constructed structures.	May – August	Moderate – suitable habitat is present along cliffs. Suitable foraging habitat found throughout Project site.
Eumops perotis californicus	western mastiff bat	-/SC	Occurs in many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, annual and perennial grasslands, palm oases, chaparral, desert scrub, and urban.	April – September	Moderate – suitable habitat is present along cliffs. Suitable foraging habitat found throughout Project site.
Martes pennanti (pacifica) DPS	Pacific fisher	FC/SC/CT	Requires intermediate to large tree stages of conifer forests and deciduous-riparian forests with a high percent canopy closure. This species uses cavities, snags, logs and rocky areas for cover and denning.	February – May Young born	Unlikely – Not within the habitat range of this species.
Vulpes macrotis mutica	San Joaquin kit fox	FE/ST	Uses grasslands and open shrub lands with loose-textured soils for burrowing.	December – March	Unlikely – No known suitable burrows are present.

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Scientific Name	Common Name	Federal/ State/CNPS Status	Habitat Requirements	Present/Breeding–Nesting–Bloom Season	Potential for Species within Project Area
Reptiles					
Emys (=Clemmys) marmorata	northwestern pond turtle	-/SC	Require some slack- or slow-water aquatic habitat. Often reach higher densities where many aerial and aquatic basking sites are available. Hatchlings require shallow-water habitat with relatively dense submergent or short emergent vegetation in which to forage. Also require an upland oviposition site (high clay or silt fraction soil, on an unshaded slope) near the aquatic site.	April – May	Moderate – suitable habitat is adjacent to Project site along river corridor.
Emys (=Clemmys) marmorata	western pond turtle	-/SC	Same as Northwestern pond turtle.	April – May	Moderate – suitable habitat is adjacent to Project site along river corridor.
Amphibians					
Ambystoma Californiense	California tiger salamander	FT/ST[b]	Breeds in freshwater ponds or vernal pools, in association with upland areas with small mammal burrows.	December – August; metamorphose during the summer	Moderate – suitable habitat is present.
Anaxyrus (=Bufo) canorus	Yosemite toad	FC/SC	Known to occur in the vicinity of montane wet meadows in the central Sierra Nevada Mountains. May also be associated with seasonal ponds in lodgepole pine or subalpine coniferous forests. 1,951 to 3,444 m.	May – July	Highly unlikely – not within known range of this species.

TABLE B-1
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Oakdale Irrigation District

Scientific Name	Common Name	Federal/ State/CNPS Status	Habitat Requirements	Present/Breeding–Nesting–Bloom Season	Potential for Species within Project Area
Rana draytonii	California red-legged frog	FT/SC	Found in humid forests, woodlands, grasslands, and streamsides with plant cover. Most common in lowlands or foothills. Frequently found in woods adjacent to streams. Breeding habitat is in permanent water sources; lakes, ponds, reservoirs, slow streams, marshes, bogs, and swamps. Typically without predatory fish, require adequate hibernacula such as small mammal burrows and moist leaf litter. From sea level to 2,439 m.	November – April	Low – potential to occur outside of the Project area along river corridor.
Rana muscosa	Mountain yellow-legged frog (Sierra Madre yellow-legged frog)	FE/SC	Federal listing refers to the population in the San Gabriel San Jacinto and San Bernardino Mountains only. Always found within a few feet of water Tadpoles can take up to 4 years to complete their aquatic development.	March – May	Highly unlikely – outside of range for this species.
Rana sierrae[a]	Sierra Nevada yellow-legged frog	FC/SC	Inhabits lakes, meadow streams, isolated pools, sunny riverbanks in the Sierra Nevada. Open stream and lake edges with a gentle slope. May require 2 to 4 years to complete their aquatic development. Occurs from 288 to over 3,657 m.	May – August	Low – potential to occur outside of the Project area along river corridor.

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Scientific Name	Common Name	Federal/ State/CNPS Status	Habitat Requirements	Present/Breeding–Nesting–Bloom Season	Potential for Species within Project Area
Spea (=Scahiopus) hammondii	western spadefoot (toad)	-/SC	Occurs primarily in grassland situations, but occasional populations also occur in valley foothill hardwood woodlands. Requires temporary rain pools with water temperatures of 9ºC and less than 30°C that last 3 weeks, and lack fish, bullfrogs, and crayfish. Soil characteristics of burrow refuge sites have not been studied, but if they are similar to those of *S. multiplicatus*, then the soil could become fairly compact and hard during the season of summer aestivation.	January – May; metamorphose in 3 to 11 weeks	Low – suitable habitat is not present directly within the Project site.
Invertebrates					
Branchinecta conservatio	Conservancy fairy shrimp	FE/-	Occurs in large, generally playa-like vernal pools with highly turbid water.	October – May	Highly unlikely – no habitat within the Project area.
Branchinecta longiantenna	longhorn fairy shrimp	FE/-	Only known to occur in a few sites along the eastern edge of the Central Coast Mountain Region, in small clear-water depressional pools in sandstone outcrops west of Tracy in Contra Costa and Alameda Counties.	December – May	Highly unlikely – no habitat in the Project area.
Branchinecta lynchi	vernal pool fairy shrimp	FT/-	Found in vernal pools (seasonal wetlands).	October – May	Highly unlikely – no habitat in the Project area.
Calicina breva	Spider	-/-	Distributed to the central Sierra Nevada and Coastal Ranges. Found under basalt rocks in grassland 1 mile S Knight's Ferry, Stanislaus County, April 11, 1967, by Briggs.	Unknown	Moderate – habitat occurs for this species.

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Scientific Name	Common Name	Federal/ State/CNPS Status	Habitat Requirements	Present/Breeding–Nesting–Bloom Season	Potential for Species within Project Area
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	FT/-	Host plant elderberry (*Sambucus ÿexicana*). Generally found in riparian stands of clustered host plant.	April – June	Moderate – elderberry shrubs are present.
Lepidurus packardi	vernal pool tadpole shrimp	FE/-	Inhabits vernal pools and swales in the Sacramento Valley and San Joaquin Valley containing clear to highly turbid water. Commonly found in grass-bottomed swales of unplowed grasslands. Some inhabit mud-bottomed and highly turbid pools.	October – May	Highly unlikely – no suitable habitat is present.
Linderiella occidentalis	California linderiella	-/-	Inhabits clear to tea-colored water in seasonal ponds, which range in size from square feet to many acres, and are typically located in grasslands or in depressions of sedimentary rock.	October – May	Highly unlikely – no suitable habitat is present.
Mussels					
Anodonta californiensis	California floater	-/-/-	Inhabits shallow muddy or sandy habitat in large rivers, reservoirs and lakes. The California floater's historic range encompassed the west coast from Baja California to southern British Columbia, and east beyond the Continental Divide. Tolerant of lower dissolved oxygen levels than other native mussel species. They prefer the softer substrates, such as sand and silt that are characteristic of permanently flooded wetlands, lakes, and reservoirs.		Highly unlikely – no suitable habitat present.

TABLE B-1
Special-status Plant and Animal Species Reported near the Proposed Two Mile Bar Tunnel Project Area
Oakdale Irrigation District

Scientific Name	Common Name	Federal/ State/CNPS Status	Habitat Requirements	Present/Breeding–Nesting–Bloom Season	Potential for Species within Project Area
Gastropods					
Monadenia mormonum hirsuta	Hirsute Sierra sideband	-/-	No specific habitat requirements could be found for this species. Typically found from 0 to 2,147 m.	Unknown	Unknown – no specific habitat requirements could be found for this species.
Fish					
Acipenser medirostris	Green sturgeon	FT/SC/ NMFS-SC	This species is the most marine-oriented sturgeon. Green sturgeon utilize both freshwater and saltwater habitat. Green sturgeon spawn in deep pools or "holes" in large, turbulent, freshwater river mainstems. Adults live in oceanic waters, bays, and estuaries when not spawning. Green sturgeon is known to forage in estuaries and bays ranging from San Francisco Bay to British Columbia.	March – July	Highly unlikely – no suitable habitat is present.
Hypomesus transpacificus	Delta smelt	FT/ST	Delta smelt are currently endemic to the Sacramento Delta, California, where it is distributed from the Suisun Bay upstream through the Delta in Contra Costa, Sacramento, San Joaquin, Solano and Yolo counties. Delta smelt spawning occurs in spring in river channels and tidally influenced backwater sloughs upstream of the mixing zone (saltwater-freshwater interface).	Fall – Winter	Highly unlikely – outside of range of this species.
Lavinia symmetricus ssp. 3	Red Hills roach	-/SC	Found in abundance in several pools of permanent water located along intermittent streams which drains into Six Bit Gulch and Poor Man's Gulch of the Red hills of Tuolumne.	Spring	Highly unlikely – no suitable habitat is present.

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Special-status Plant and Animal Species Reported near the Proposed Two Mile Bar Tunnel Project Area
Oakdale Irrigation District

Scientific Name	Common Name	Federal/ State/CNPS Status	Habitat Requirements	Present/Breeding–Nesting–Bloom Season	Potential for Species within Project Area
Oncorhynchus clarki seleniris	Paiute cutthroat trout	FT/-	Found on the eastern slope of the Sierra Nevada range. All life stages require cool, well-oxygenated waters. Adult fish prefer stream pool habitat in low gradient meadows with undercut or overhanging banks and abundant riparian vegetation. Paiute cutthroat trout can survive in lakes, but there is no evidence that they ever occurred naturally in any of the lakes within the Silver King basin.	June – July	Highly unlikely – not within the known range of this species.
Oncorhynchus mykiss	Central Valley steelhead	FT/-	Found in tributaries to the San Francisco Bay, including the South Bay. Pass through the San Francisco Estuary during migration to streams for spawning, and during outmigration to the ocean. Spawns in small streams and tributaries with cold, clean water flowing over graveled bottoms and deep pools.	Migrates July – May; spawns December – April	Highly unlikely – no suitable habitat is present.
Oncorhynchus tshawytscha	Central Valley spring-run Chinook salmon	FT/-	Found in tributaries to the San Francisco Bay including the Sacramento River watersheds. Passes through the San Francisco Estuary during migration to streams for spawning, and during outmigration to the ocean. Spawns in well-oxygenated water in swift, shallow riffles, or at edges of fast runs with loose gravel.	Migrates during spring months; holds in headwaters areas, and spawns during late summer and early fall	Highly unlikely – no suitable habitat is present.
Non-vascular Plants					
Scopelophila cataractae	Tongue-leaf copper moss	-/-/CNPS 2.2	Moss that occurs on metamorphic soils in cismontane woodlands. 400 m.		Moderate – suitable habitat present.
Vascular Plants					
Agrostis hendersonii	Henderson's bent grass	-/-/CNPS 3.2	Annual herb found in mesic valley and foothill grassland and vernal pools.	April – June	Low – marginal habitat is present.

TABLE B-1
Special-status Plant and Animal Species Reported near the Proposed Two Mile Bar Tunnel Project Area
Oakdale Irrigation District

Scientific Name	Common Name	Federal/ State/CNPS Status	Habitat Requirements	Present/Breeding–Nesting–Bloom Season	Potential for Species within Project Area
Brodiaea pallida	Chinese camp brodiaea	FT/SE/ CNPS 1B	Grows in seeps and springs in serpentine and volcanic soils in the central California Sierra foothills. 385 m.	May – June	Unlikely – no suitable seeps or spring habitat present.
Calycadenia hooveri	Hoover's calycadenia	-/-/ CNPS 1B	Inhabits thin soils and small soils-filled cracks on and around rocky outcrops in valley and foothill woodlands. 65 to 300 m.	July – September	Moderate – suitable habitat is present.
Castilleja campestris spp. succulenta	succulent owl's-clover	FT/SE/ CNPS 1B	Vernal pool obligate in close association with acidic soils. Restricted to northeastern San Joaquin Valley. 50 to 750 m.	As pools recede in spring	Highly unlikely – limited marginal to poor habitat is present; no acidic soils are present.
Chamaesyce hooveri	Hoover's spurge	FT/-/ CNPS 1B	Endemic to larger vernal pools typically in barren soils often occurring with orcuttia grasses. 25 to 250 m.	July	Highly unlikely – no suitable is habitat present.
Chlorogalum grandiflorum	Red Hills soaproot	-/-/CNPS 1B.2	Perennial bulbiferous herb found in cismontane woodland, chaparral, and lower montane coniferous forest. Occurs on both serpentine and gabbro substrates, often on historically disturbed sites. 245 to 1,170 m.	May – June	Low – marginal habitat might be present.
Clarkia rostrata	beaked clarkia	-/-/ CNPS 1B	Typically inhabits steep to moderate slopes in valley and foothill annual grasslands and foothill savannas and woodlands. 60 to 500 m.	April – May	Moderate – suitable habitat is present.
Cryptantha hooveri	Hoover's cryptantha	-/-/ CNPS 1A	Occurs in cismontane woodland, valley, and foothill grasslands with rocky soils. 9 to 150 m.	July – September	Moderate – suitable habitat is present.
Cryptantha mariposae	Mariposa cryptantha	-/-/CNPS 1B.3	Annual herb found in rocky serpentine chaparral. 200 – 650 m.	April – June	Low – marginal habitat is present.

TABLE B-1
Special-status Plant and Animal Species Reported near the Proposed Two Mile Bar Tunnel Project Area
Oakdale Irrigation District

Scientific Name	Common Name	Federal/ State/CNPS Status	Habitat Requirements	Present/Breeding–Nesting–Bloom Season	Potential for Species within Project Area
Downigia pusilla	dwarf downingia	-/-/CNPS 2	Largely restricted to vernal pools and sometimes vernal pool swales or ephemeral wetlands in valley and foothill annual grasslands. 1 to 445 m.	March – May	Highly unlikely – no suitable is habitat present.
Eryngium pinnatisectum	Tuolumne button-celery	-/-/ CNPS 1B	Occurs in cismontane woodlands, lower montane coniferous forests, and vernal pools. Prefers mesic soils. 70 to 915 m.	June – August	Low – marginal habitat is present.
Eryngium spinosepalum	Spiny-sepaled button-celery	-/-/1B.2	Annual/perennial herb found in valley and foothill grassland and vernal pools. 80 to 255 m.	April – May	Low – marginal habitat is present.
Juncus nodosus	knotted rush	-/-/CNPS 2	Occurs in wet meadows, springs, fens, shores, and streambanks, where water is fresh. 30 to 1,980 m.	July – September	Highly unlikely no suitable habitat is present.
Lomatium congdonii	Congdon's lomatium	-/-/CNPS 1B.2	Perennial herb found in chaparral and cismontane woodland, on serpentine soils with serpentine chaparral plants and grey pines. 300 to 2,100 m.	March – June	Moderate – suitable habitat is present.
Lupinus spectabilis	Shaggyhair lupine	-/-/CNPS 1B.2	Annual herb that occurs in chaparral, cismontane woodland; open rocky slopes of serpentine chaparral surrounded by grey pine woodland. 260 to 825 m.	April – May	Moderate – suitable habitat is present.
Monardella douglasii ssp. venos	Veiny monardella	-/-/CNPS 1B.1	Annual herb that occurs in valley and foothill grassland, cismontane woodland; in heavy clay, mostly with grassland associates. 60 to 410 m.	May – July	Moderate – suitable habitat is present.
Monardella leucocephala	Merced monardella	-/-/CNPS 1A	Valley and foothill grassland. Known from riverbeds, moist sandy depressions; requires moist subalkaline sands associates with low elevation grassland. 35 to 100 m.	May – August	Low – marginal habitat might be present.

TABLE B-1
Special-status Plant and Animal Species Reported near the Proposed Two Mile Bar Tunnel Project Area
Oakdale Irrigation District

Scientific Name	Common Name	Federal/ State/CNPS Status	Habitat Requirements	Present/Breeding–Nesting–Bloom Season	Potential for Species within Project Area
Neostapfia colusana	Colusa grass	FT/SE/ CNPS 1B	Occurs in Central Valley vernal pools: northern hardpan vernal pools and northern claypan vernal pools. Needs long duration of inundation. 5 to 200 m.	May – August	Highly unlikely – no suitable habitat is present.
Orcuttia inaequalis	San Joaquin orcutt grass	FT/FE/CNPS 1B.1	Annual herb that occurs in vernal pools. 10 to 755 m.	April – September	Highly unlikely – no suitable habitat is present.
Orcuttia pilosa	hairy orcutt grass	FE/SE/ CNPS 1B	Occurs in large vernal pools and occasionally in seasonal stock ponds. Requires long periods of inundation for germination. 46 to 200 m.	May – September	Highly unlikely – no suitable is habitat present.
Pseudobahia bahiifolia	Hartweg's golden sunburst	FE/SE/ CNPS 1B	Inhabits upland sites in valley and foothill annual grasslands typically with mima mound topography formed on acidic soils.15 to 150 m.	March – April	Low – marginal habitat might be present.
Packera (=Senecio) layneae	Layne's ragwort (=Layne's butterweed)	FT/SR/1B.2	Perennial herb that occurs in chaparral, cismontane woodland. Occurs on ultramafic or gabbroic soils, occasionally along streams. 200 to 1,000 m.	April – August	Moderate – suitable habitat is present.
Tuctoria greenei	Green's tuctoria	FE/SR/ 1B	Occurs in Central Valley vernal pools: northern hardpan vernal pools and northern claypan vernal pools. 30 to 1,070 m.	May – July	Highly unlikely – no suitable is habitat present.
Verbena californica	Red Hills vervain	FT/ST/1B.1	Perennial herb found in cismontane woodland, valley and foothill grassland. Occurs on mesic sites on sites, usually serpentine seeps or creeks. 260 to 400 m.	May – September	Low – marginal habitat is present.

TABLE B-1
Special-status Plant and Animal Species Reported near the Proposed Two Mile Bar Tunnel Project Area
Oakdale Irrigation District

Scientific Name	Common Name	Federal/ State/CNPS Status	Habitat Requirements	Present/Breeding–Nesting–Bloom Season	Potential for Species within Project Area

[a]This species does not occur on any species list; however, this species should supersede *Rana muscosa,* which is identified on the U.S. Fish and Wildlife Service list.

[b]Pending hearing on May 5, 2010.

Notes:

ºC = degrees Celsius
m = meters

California Native Plant Society (CNPS)

1A – Species is presumed extinct in California
1B – Plants Rare, Threatened, or Endangered in California and Elsewhere
2 – Plants Rare, Threatened, or Endangered in California but More Common Elsewhere
3 – Distributed in one to several highly restricted occurrences, or present in such

Federal and California Endangered Species Act

FC – Federal Candidate for Listing as Threatened or Endangered
FE – Federal Endangered
FT – Federal Threatened
NMFS – Species under the Jurisdiction of the National Oceanic and Atmospheric Administration
NMFS-SC – Species of Concern
SC – California Species of Concern
SCT – California Candidate Threatened
SE – State Endangered
SR – State Rare
ST – State Threatened

References: U.S. Fish and Wildlife Service, California Department of Fish and Game, California Natural Diversity Database

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Appendix E

USFWS Species List and Consultation

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United States Department of the Interior
FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825

March 26, 2014

Document Number: 140326042559

Mario Parker
US Army Corps of Engineers
1325 J Street
Sacramento, CA 95814

Subject: Species List for Oakdale Irrigation District Right-of-Way for the Two- Mile Bar Tunnel Project

Dear: Biological Sciences Study Manager

We are sending this official species list in response to your March 26, 2014 request for information about endangered and threatened species. The list covers the California counties and/or U.S. Geological Survey 7½ minute quad or quads you requested.

Our database was developed primarily to assist Federal agencies that are consulting with us. Therefore, our lists include all of the sensitive species that have been found in a certain area *and also ones that may be affected by projects in the area*. For example, a fish may be on the list for a quad if it lives somewhere downstream from that quad. Birds are included even if they only migrate through an area. In other words, we include all of the species we want people to consider when they do something that affects the environment.

Please read Important Information About Your Species List (below). It explains how we made the list and describes your responsibilities under the Endangered Species Act.

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be June 24, 2014.

Please contact us if your project may affect endangered or threatened species or if you have any questions about the attached list or your responsibilities under the Endangered Species Act. A list of Endangered Species Program contacts can be found here.

Endangered Species Division

U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 140326042559

Database Last Updated: September 18, 2011

Quad Lists

Listed Species

Invertebrates

Branchinecta conservatio
Conservancy fairy shrimp (E)

Branchinecta lynchi
vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
valley elderberry longhorn beetle (T)

Lepidurus packardi
vernal pool tadpole shrimp (E)

Fish

Hypomesus transpacificus
delta smelt (T)

Oncorhynchus mykiss
Central Valley steelhead (T) (NMFS)
Critical habitat, Central Valley steelhead (X) (NMFS)

Oncorhynchus tshawytscha
Central Valley spring-run chinook salmon (T) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense
California tiger salamander, central population (T)

Rana draytonii
California red-legged frog (T)

Mammals

Vulpes macrotis mutica
San Joaquin kit fox (E)

Plants

Neostapfia colusana
Colusa grass (T)
Critical habitat, Colusa grass (X)

Pseudobahia bahiifolia
Hartweg's golden sunburst (E)

Tuctoria greenei
Critical habitat, Greene's tuctoria (=Orcutt grass) (X)

Quads Containing Listed, Proposed or Candidate Species:

KNIGHTS FERRY (459C)

County Lists

No county species lists requested.

Key:

(E) *Endangered* - Listed as being in danger of extinction.

(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.

(P) *Proposed* - Officially proposed in the Federal Register for listing as endangered or threatened.

(NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.

Critical Habitat - Area essential to the conservation of a species.

(PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.

(C) *Candidate* - Candidate to become a proposed species.

(V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.

(X) *Critical Habitat* designated for this species

Important Information About Your Species List

How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, **or may be affected by** projects within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

Plants

Any plants on your list are ones that have actually been observed in the area covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the surrounding quads through the California Native Plant Society's online Inventory of Rare and Endangered Plants.

Surveying

Some of the species on your list may not be affected by your project. A trained biologist and/or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list. See our Protocol and Recovery Permits pages.

For plant surveys, we recommend using the Guidelines for Conducting and Reporting Botanical Inventories. The results of your surveys should be published in any environmental documents prepared for your project.

Your Responsibilities Under the Endangered Species Act

All animals identified as listed above are fully protected under the Endangered Species Act of

1973, as amended. Section 9 of the Act and its implementing regulations prohibit the take of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

> Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures:

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a formal consultation with the Service.

  During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the project on listed and proposed species. The opinion may authorize a limited level of incidental take.

- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.

  Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. You should include the plan in any environmental documents you file.

Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as critical habitat. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may be found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our Map Room page.

Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

Species of Concern

The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern. However, various other agencies and organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts. More info

Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6520.

Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be June 24, 2014.

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Appendix F

Rare Plant Survey Report

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Report

Oakdale Irrigation District's South Main Canal Two-Mile Bar Tunnel Project – Rare Plant Survey Report

Prepared for

Oakdale Irrigation District

August 2010

CH2MHILL
2525 Airpark Drive
Redding, CA 96001

Contents

Acronyms and Abbreviations

CDFG	California Department of Fish and Game
CNPS	California Native Plant Society
NRCS	Natural Resources Conservation Service
OID	Oakdale Irrigation District
U.C. Berkley	University of California, Berkley
USFWS	U.S. Fish and Wildlife Service

SECTION 1

Introduction

The South Main Canal supplies the entire southern portion of Oakdale Irrigation District's (OID) service area. The canal's overall length, from Goodwin Dam to Robert Van Lier Reservoir, is approximately 20 miles. The canal has a capacity of approximately 525 cubic feet per second and supplies about 32,000 irrigated acres, or 60 percent of OID irrigated lands. A section of the South Main Canal between Two-Mile Bar and Highway 108 remains at high risk hazard because of potential rock-fall from the slope above. OID is proposing to build a new tunnel that will address the highest risk area. The upstream portal of the proposed Two-Mile Bar Tunnel begins near the parking lot at the end of Two-Mile Bar Road and reconnects to the existing canal about one mile downstream. Approximately one-half of the tunnel spoils will be used to fill in approximately 1.3 miles of the abandoned canal section. The sides of the canal will be demolished and folded into the canal along with this fill to create a level grade.

This report presents the results of special plant surveys for the proposed Two Mile Bar Tunnel Project (project).

Project Location

The project is located in Stanislaus and Tuolumne Counties approximately 1 mile to the northeast of Knights Ferry, California (Figure 1). The proposed new tunnel inlet portal will be located near the Two-Mile Bar Recreation Access parking lot, and the downstream portal will be 5,860 feet downstream (southwest) of this area (Figure 2). The average tunnel depth is approximately 200 feet below ground. The project is located in the Knights Ferry 7.5-minute United States Geological Survey Quadrangle in Sections 21, 22, and 28 of Township 1 south, range 12 east (Mount Diablo Meridian). The upstream portal is located at 37.83993 north latitude, -120.64014 west longitude; the downstream portal is located at 37.82719 north latitude, -120.65256 west longitude.

Environmental Setting

Regionally the project is located in the Lower Foothills Metamorphic Belt Ecological Sub-Section of the Sierra Nevada Foothills (Miles and Goudey, 1998). This area includes the lower elevation western edge of the Sierra Nevada and is characterized by moderately steep to steep mountains and hills with occasional plateaus. Several major rivers cut across the ridges, but alluvial fans, floodplains, and terraces are uncommon (Miles and Goudey, 1998).

Locally, the portion of the South Main Canal that will be replaced by the tunnel is located along a steep canyon slope above the Stanislaus River. The upstream portal and associated staging area for the new tunnel are located at elevations between 340 and 400 feet on a moderate to steep (15 to 50 percent grade) northeast facing slope. A large, relatively level plateau is located approximately 185 feet upslope of the portal location. Drainage in this

area is generally to the northwest. The downstream portal and associated staging area are located along the western side of the plateau, on a hill slope above the Stanislaus River, at elevations between 330 to 400 feet. This west-facing hillside is moderately steep with slopes ranging from 30 to 40 percent.

Surrounding Land Uses

The area near the upstream portal is characterized by a recreation area (Two-Mile Bar) operated by the Stanislaus River Parks Division of the U.S. Army Corps of Engineers. Two-Mile Bar has a parking lot and day use facilities that provide access to the Stanislaus River. Gold panning, rafting and fly-fishing are popular in this area. The area above the proposed tunnel, on the plateau to the southeast of the existing canal, is an undeveloped rocky pasture that is used primarily for grazing. The downstream portal area is undeveloped with limited grazing.

Vegetation Types and Natural Communities

Vegetation descriptions for this report are based on field observations and recognized vegetation classifications from *A Manual of California Vegetation* (Sawyer et al., 2009). Blue Oak woodland (*Quercus douglasii*) is the primary vegetation community associated with the upstream and downstream portal locations. In these areas blue oak (*Quercus douglasii*) is the dominant tree species with occasional interior live oak (*Quercus wislizeni*) and California buckeye (*Aesculus californica*) also present. The understory vegetation is composed primarily of naturalized annual grasses, including ripgut brome *(Bromus diandrus)*, Medusa-head (*Taeniatherum caput-medusa*), and wild oats (*Avena fatua*). Rock outcrops are common throughout.

The vegetation along the canal appears to be at the upper edge of the transitional area between the blue oak woodland (upslope) and the riparian community along the Stanislaus River (downslope). Blue oak, interior live oak, and California buckeye are the most common species along the canal. Tree of heaven (*Ailanthus altissima*), a highly invasive introduced species, is locally common in some areas, especially towards the upstream portion of the canal section. Cottonwood (*Populus fremontii*) and willow (*Salix lasiolepis, S. laevigata*) are relatively uncommon and occur primarily towards the downstream portion of the canal segment. Large toyon (*Heteromeles arbutifolia*) shrubs are common throughout and are often intermixed with dense patches of poison oak (*Toxicodendron diversilobum*). Understory vegetation is predominantly non-native grasses and weedy forbs such as rip-gut brome, foxtail barley (*Hordeum murinum*), and Italian thistle (*Carduus pycnocephalus*). Scattered, sparse vegetation along the upper edges of the canal includes species such as Italian ryegrass (*Lolium multiflorum*), cockle burr *(Xanthium strumarium)*, turkey mullein (*Croton setigerus*), and curly dock (*Rumex crispus*).

Vernal pool habitat was not observed within the Project boundaries. Vernal pools are relatively common and widespread in the annual grassland community located on the broad plateau upslope of the canal and portal locations. This vernal pool complex is not located within the project study area and the new tunnel will be approximately 200 feet below the surface of the plateau so that there is no potential to impact the hydrology of overlying soils.

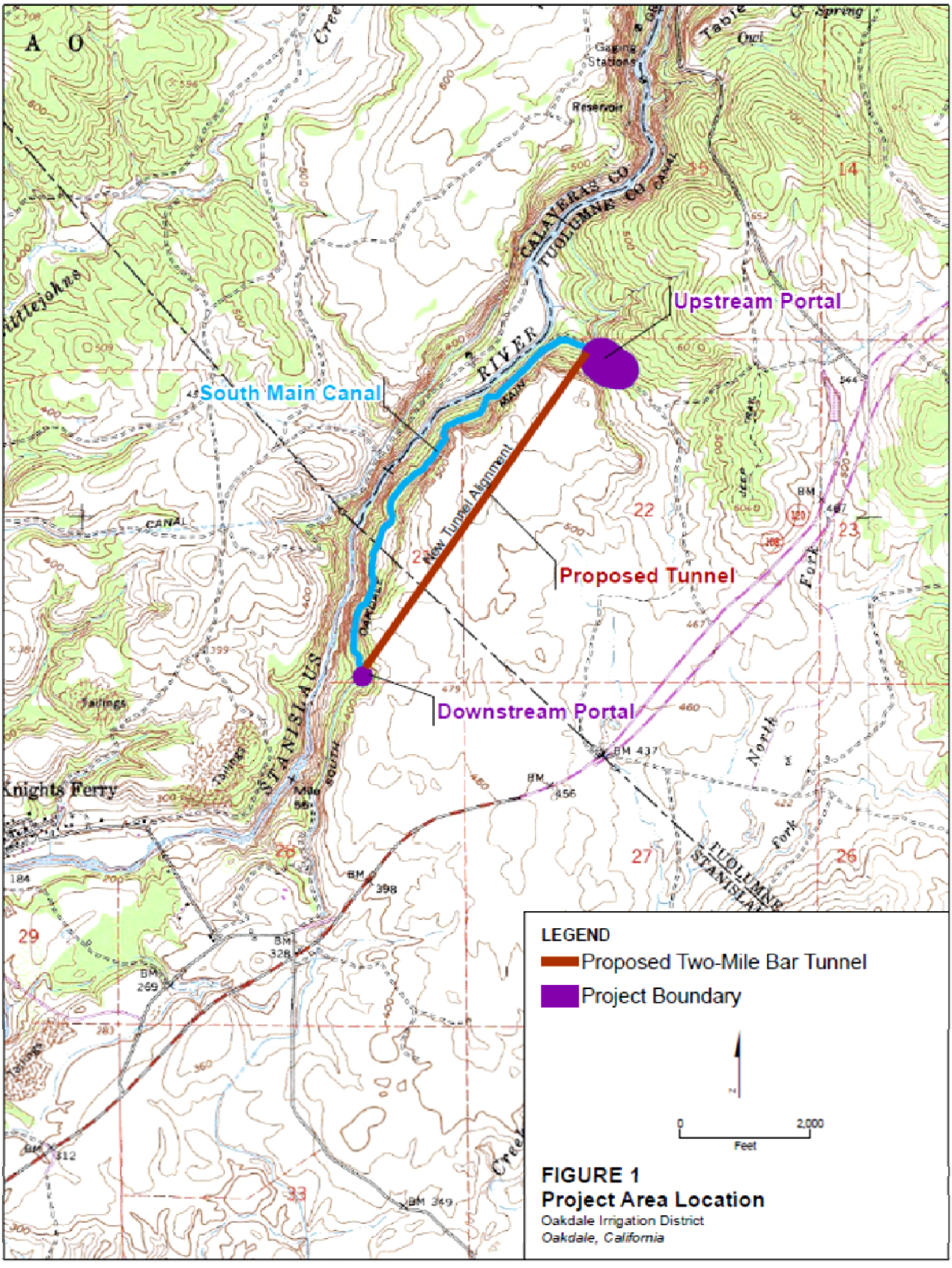

FIGURE 1
Project Area Location
Oakdale Irrigation District
Oakdale, California

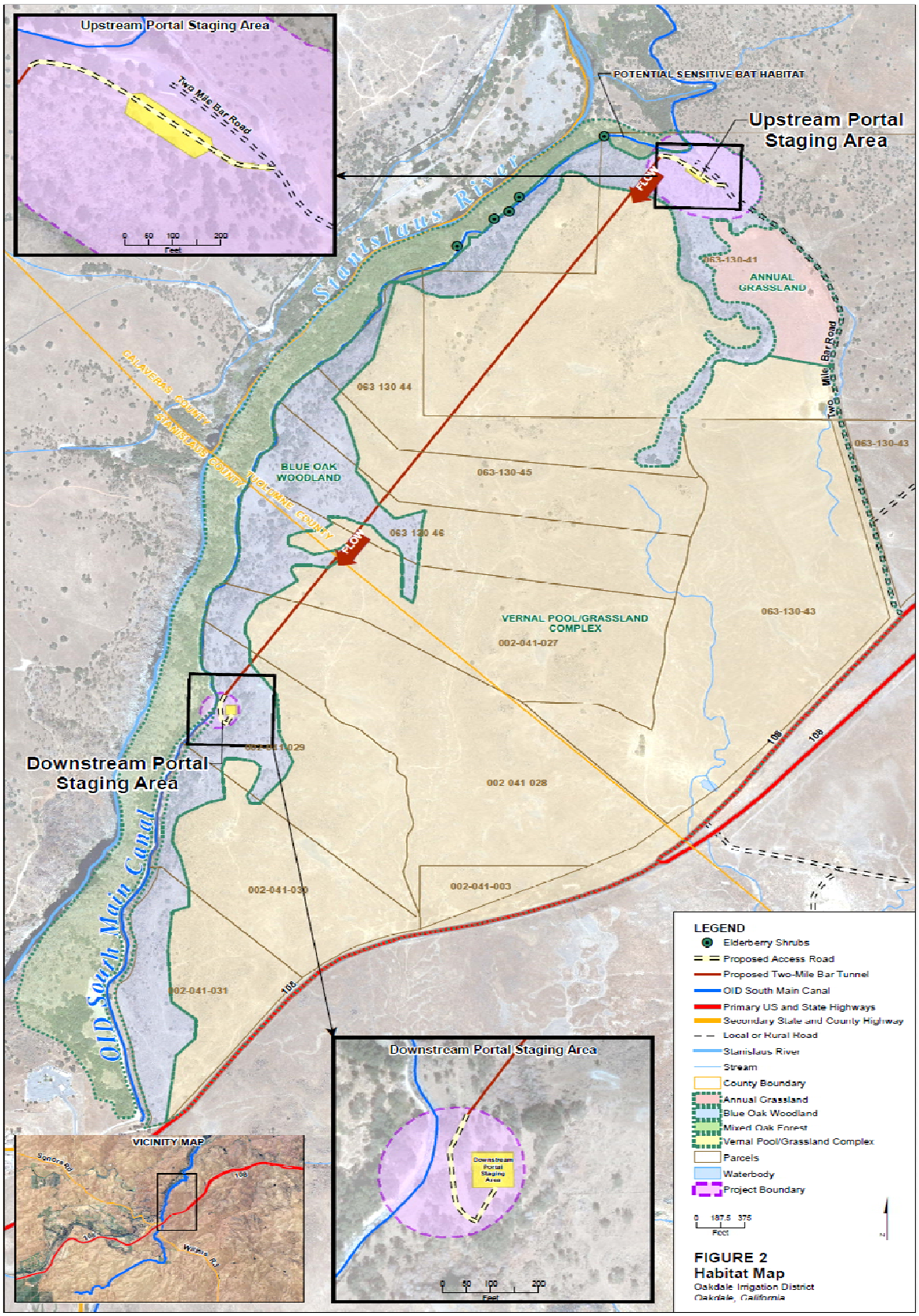

FIGURE 2
Habitat Map
Oakdale Irrigation District
Oakdale, California

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Climate

The regional climate is characterized by cool, wet winters and warm, dry summers. Temperatures range from an average low of 35 degrees Fahrenheit in January to an average high of 96 degrees Fahrenheit in July. The average annual precipitation is 13.33 inches, the majority of which occurs between November and March (Western Regional Climate Center, 2010). Total precipitation between November 2009 and July 2010 was 14.47 inches, which is above the average rainfall of 12.48 inches for this time period (University of California Integrated Pest Management, 2010). The average rainfall is partially a result of several late spring storm events that resulted in above average precipitation in April, May, and June (Figure 3).

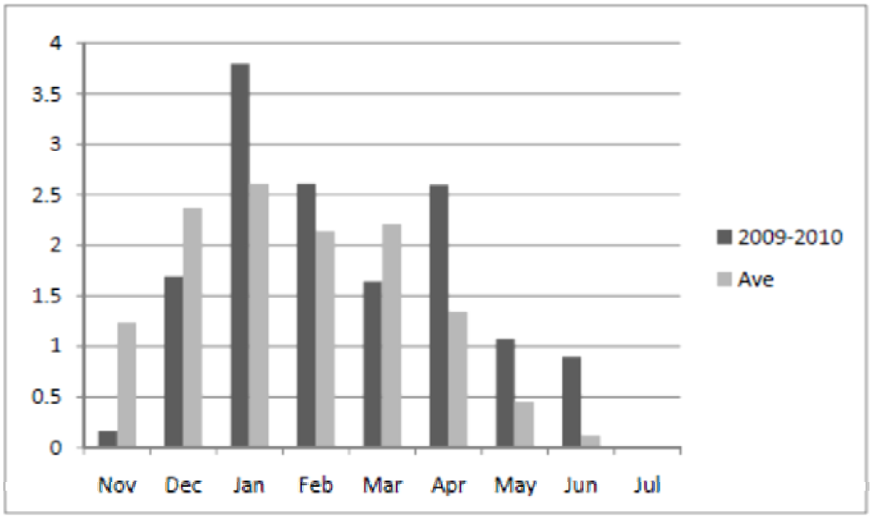

FIGURE 3
Precipitation Data from Oakdale California, Average and Recorded Rainfall from November through July

Soils

Information on soils types in the project area are based on the Soil Survey for the Eastern Stanislaus Area (Natural Resources Conservation Service [NRCS], 1964). No soil data were available for western Tuolumne County, but presumably the soils in this area are very similar to those found in eastern Stanislaus County. The project area includes the following two mapped units: Lava and Sandstone Rockland (La) and Schist Rockland (Sc). Because these units provide little to no agricultural value, they have been only briefly described in the soil survey as a "blocky jumble of lava or sandstone" or "rock slabs" (NRCS, 1964). Common soil series associate with these mapped units include Auburn, Exchequer, Hornitos, Toomes, and Whiterock. General descriptions of these soils are provided below based on the official soil series descriptions (NRCS, 2010) and the Soil Survey for the Eastern Stanislaus Area (NRCS, 1964).

Auburn

This series consists of shallow to moderately deep, well drained soils that formed in material weathered from amphibolites schist. The soils is a slightly acidic silt loam to clay

loam with up to 25 percent rock fragments consisting of pebbles, cobbles and stones. Rock outcrops are common. This soil has moderate permeability with low to high runoff.

Exchequer

Exchequer soils are shallow, somewhat excessively drained, rocky loam to silt loam soils that formed in material weathered from hard andesitic breccias, schist, and metamorphosed volcanic rocks. These soils are slightly acidic, generally low in organic matter and contain up to 30 percent pebbles and cobbles. "Tombstone-like" rock outcrops of vertically bedded schist are frequent (NRCS, 1964). These soils have moderate permeability and medium to rapid runoff.

Hornitos

Hornitos soils are moderately to strongly acidic, fine sandy loam soils that are underlain by soft, moderately consolidated sandstones of the Ione formation. Hornitos soils are somewhat excessively to well drained with moderate to rapid permeability and slow to rapid runoff.

Toomes

The Toomes series consists of very shallow to shallow, somewhat excessively drained soils that formed in material weathered from tuff breccias, basalt, and andesite. These soils area slightly acidic gravelly to rocky loams with up to 15 percent rock fragments. Rock outcrops and stones comprise up to 50 percent of the surface area. Toomes soils have moderate permeability and moderate to rapid runoff.

Whiterock

Whiterock soils are very shallow, somewhat excessively drained, moderately acidic loam to silt loam soils with up to 35 percent coarse fragments. These soils formed in material weathered from metasedimentary rocks, slate and partially metamorphosed sandstone. Rock outcrops are common. Whiterock soils have moderate permeability and slow to rapid runoff.

SECTION 2

Methods

Field surveys for biological resources, including special-status plant species were conducted on multiple dates between September 2009 and August 2010. The survey area included the construction work areas for the upstream and downstream portal locations as well as the section of the South Main Canal that would be abandoned and filled upon tunnel completion. Surveys were conducted according to the botanical survey guidelines of the U.S. Fish and Wildlife Service [USFWS] (1996), California Department of Fish and Game [CDFG] (2009), and the California Native Plant Society [CNPS] (2001).

Pre-field Preparations

A list of potentially occurring special-status plant species was prepared by completing nine-quadrangle database searches using the CNPS (2010) Online Inventory of Rare and Endangered Plants of California and the California Natural Diversity Database (CDFG, 2010). These database searches included the following United States Geological Survey 7.5 Minute Quadrangles: Knights Ferry, Cooperstown, Keystone, New Melones Dam, Copperopolis, Bachelor Valley, Oakdale, Waterford, and Paulsell. In addition, a list of Federal Endangered and Threatened species for Stanislaus and Tuolumne Counties was obtained from the USFWS (2010).

The nine quadrangle CNPS, CDFG database searches, and the USFWS county lists identified a total of 25 special-status plant species[1] in the regional vicinity of the project. Most of the species (18 out of 25) are typically associated with habitats and substrates that are not found in the project area, such as vernal pools, serpentine chaparral, sandy soils, and wetlands. These species were considered unlikely to occur (Appendix A). The remaining seven species were considered to have some potential for occurrence based on the presence of suitable habitat (Table 1). The list of target plants was developed to identify special-status plants that are most likely occur; however, other special-status plant species may be present and therefore all plant species were identified during the survey to the taxonomic level necessary to determine their conservation status.

Prior to the field surveys, information on blooming periods, habitat preferences, geographic distribution, and known locations near the project was reviewed. This information was compiled from the sources used to complete database searches, as previously discussed, and other sources, including *The Jepson Manual: Higher Plants of California* (Hickman, 1993) and *Jepson Online Interchange for California Floristics* (University of California, Berkley [U.C. Berkley], 2010). Photographs and written descriptions of all potentially occurring special-status plant species were also reviewed prior to the field surveys.

[1] A species was considered to have a special status if it met one or more of the following criteria: federally or state-listed, or proposed for listing, as rare, threatened or endangered under the Federal Endangered Species Act and California Endangered Species Act; federal candidate for listing; Special Plant, as defined by the CNDDB in its special plants, bryophytes and lichens list (CDFG, 2010); or listed by the CNPS in the online version of its Inventory of Rare and Endangered Plants of California (CNPS, 2010).

Field Surveys

Botanical surveys were completed during the appropriate blooming periods or when the target special-status species are most identifiable. Initial habitat characterization surveys and general biological surveys of the site were conducted by CH2M HILL biologists Lyna Black and Danielle Tannourji on September 21, 2009. Specific botanical surveys were completed by CH2M HILL biologist Danielle Tannourji on April 15, 2010, and CH2M HILL biologist Russell Huddleston on June 11 and August 2, 2010. Sally Davis and Jason Capdevielle from the Oakdale Irrigation District provided field assistance during each of the survey efforts.

The surveys were floristic in nature, meaning that all species encountered were identified to the taxonomic level necessary to determine if they have a special-status designation. Botanical surveys were completed by walking meandering transects throughout the proposed work areas for the upstream and downstream portals. Surveys along the section of the South Main Canal proposed for abandonment were limited to the maintenance trail located along the northwest side of the canal.

Any plant species that was not readily identifiable was either keyed in the field using *The Jepson Manual: Higher Plants of California* (Hickman, 1993) or a specimen was collected for later identification (if a suitable number of plants were present). A complete list of plant species observed during the botanical surveys is presented in Appendix B. Scientific names used throughout this report follow the currently accepted taxonomy per the *Jepson Interchange for California Floristics* (U.C. Berkley, 2010). Representative site photographs are included in Appendix C.

Reference Populations

A reference population for Colusa grass (*Neostapfia colusana*) at the Jepson Prairie Preserve in Solano County was observed on August 1, 2010. This area was selected as all reported occurrences of this species in the Stanislaus and Tuolumne Counties are located on private property. The population at Jepson Prairie was evident, but the plants had completed flowering and had begun to senesce (see photograph in Appendix C).

TABLE 1
Special-status Plant Species Considered Likely to Occur in the Project Area

Scientific Name	Common Name	CNPS/ Federal/ State[a]	General Habitat Description[b,c]	Notes[c]
Calycadenia hooveri	Hoover's calycadenia	1B.3/-/-	Cismontane woodland and valley and foothill grassland; often on exposed rocky barren soils at elevations between 200 and 1,000 feet. Blooms: May-Jun	Suitable habitat is present and there are several reported occurrence in the regional project area. The nearest occurrence is located in an annual grassland area on a rocky hilltop approximately 4.5 miles south of the downstream portal.
Chlorogalum grandiflorum	Red Hills soaproot	1B.2/-/-	Chaparral, cismontane woodland, and lower coniferous forest; often associated with serpentine and gabbroic soils but not restricted to these substrates; at elevations between 800 and 4,070 feet. Blooms: May-Jun	Suitable habitat is present. There is one occurrence in the regional project area from in a serpentine chaparral community approximately 8.5 miles northeast of the upstream portal.
Clarkia rostrata	Beaked clarkia	1B.3/-/-	Cismontane woodland and valley and foothill grasslands at elevations between 200 and 1,640 feet. Blooms: Apr-May	Suitable habitat is present and there are several reported occurrence is the regional project vicinity. The nearest occurrence is approximately 6 miles to the northeast of the upstream portal.
Eryngium pinnatisectum	Tuolumne button celery	1B.2/-/-	Mesic sites in cismontane woodland and lower montane coniferous forest, and vernal pools; volcanic soils; at elevations between 230 and 3,000 feet. Blooms: May-Aug	Marginal Suitable habitat is present because of mostly dry woodland slopes. The nearest reported occurrence is from a vernal pool approximately 8 miles northeast o f the upstream portal.
Fritillaria agrestis	Stinkbells	4.2/-/-	Chaparral, cismontane woodland, Pinyon and juniper woodland, and valley and foothill grassland; found on clay soil; sometimes serpentine; at elevations from 30 to 5,100 feet. Blooms: Mar-Jun	Suitable habitat present. One reported occurrence in annual grassland located approximately 5 miles south of the downstream portal.
Monardella douglasii ssp. *venosa*	Veiny monardella	1B.1/-/-	Cismontane woodland and annual grassland in heavy clay soil; at	Suitable habitat present. One reported occurrence within 4 to 6 miles of the north

TABLE 1
Special-status Plant Species Considered Likely to Occur in the Project Area

Scientific Name	Common Name	CNPS/ Federal/ State[a]	General Habitat Description[b,c]	Notes[c]
			elevations between 60 and 1,350 feet. Blooms: May-Jul	portal. California Natural Diversity Database does not provide specific location information on this occurrence – species previously thought to have been extirpated from California, rediscovered in 1992.
Pseudobahia bahiifolia	Hartweg's golden sunburst	1B.1/E/E	Cismontane woodland and valley and foothill grassland; often on acidic clay soils; at elevations between 50 and 500 feet. Blooms: Mar-Apr	Suitable habitat present. Several reported occurrences in the regional project area; including two reported occurrences within 5 miles of the downstream portal.

[a]CNPS List

1B Plants Rare, Threatened, or Endangered in California and Elsewhere
4 Plants of Limited Distribution - A Watch List

[a]State and Federal Listing

T Threatened
E Endangered

CNPS Threat Ranks

.1 Seriously threatened in California (high degree/immediacy of threat)
.2 Fairly threatened in California (moderate degree/immediacy of threat)
.3 Not very threatened in California (low degree/immediacy of threats or no current threats known)

[b]CNPS, 2010

[c]CDFG, 2010

SECTION 4

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Appendix G

Elderberry Survey Technical Memorandum

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Elderberry Survey for Oakdale Irrigation District's Two Mile Bar Tunnel Project

TO: Maryann Owens/U.S. Fish and Wildlife Service

COPIES: John Davids/Oakdale Irrigation District
John Schoonover/CH2M HILL

FROM: Russell Huddleston/CH2M HILL

DATE: August 11, 2010

Introduction

This technical memorandum documents the observations of elderberry shrubs (*Sambucus mexicana*) along an approximate 1.3-mile stretch of Oakdale Irrigation District's (OID) South Main Canal. The Two Mile Bar Tunnel Project (Project) is located in Stanislaus and Tuolumne Counties approximately 8 miles east of Oakdale, California, just northwest of Highway 108.

A section of the South Main Canal between Two Mile Bar and Highway 108 remains at high risk hazard due to potential rock-fall from the slope above. OID is proposing to build a new tunnel that will address the highest risk area. The upstream portal of the proposed Two Mile Bar Tunnel begins near the parking lot at the end of Two Mile Bar Road and reconnects to the existing canal about 1 mile downstream. Approximately one-half of the tunnel spoils will be used to fill in approximately 1.3 miles of the abandoned canal section. The sides of the canal will be demolished and folded into the canal along with this fill to create a level grade.

OID has proposed measures in the draft mitigated negative declaration (MND) that will protect plants and wildlife, and eliminate potential take of any listed species. Because there is no impact to wetlands or other federal nexus, OID has requested an informal consultation with U.S. Fish and Wildlife Service (USFWS) to obtain concurrence that the Project is not likely to adversely affect any species, and allow construction near elderberry shrubs. This technical memorandum re-confirms the number of elderberries within the Project area and provides additional photographs of the shrubs.

As stated in the MND that was circulated and provided to USFWS, OID will ensure that elderberries are fenced, and appropriate signs are in place prior to construction as described in the 1999 USFWS *Conservation Guidelines for Valley Elderberry Longhorn Beetle* (VELB). The existing canal configuration will not allow for a 30-foot buffer to be used during construction; however, the elderberry shrubs will not be removed and will remain in place following construction. OID has requested concurrence from USFWS that the temporary construction around the elderberries will not likely adversely affect VELB once the proposed protection measures presented in the MND are implemented.

Methods

A pedestrian survey of the portion of the canal to be abandoned was conducted on August 2, 2010, by CH2M HILL ecologist Russell Huddleston along with Sally Davis and Jason Capdevielle from OID. The canal was flowing at the time of the survey, and access was only possible along the maintenance trail located on the downslope (generally northwest) side of the canal. A Trimble GEO-XT® Global Positioning System (GPS) was used to record the location of all elderberry shrubs that were observed in the immediate vicinity of the canal. A GPS point was recorded as near as possible to the base of the shrubs adjacent to the maintenance trail or directly across from any shrubs that were located on the upslope (generally southeast) side of the canal. The approximate location of the shrub in relation to the canal, general condition of the shrub, and common associated species were noted in the field (Attachment 1). To the extent possible, stems were examined for evidence of VELB exit holes. A photograph of each shrub and, where possible, the root zone, was taken at each recorded location (Attachment 2).

Results and Discussion

The vegetation along the canal appears to be at the upper edge of the transitional area between the blue oak woodland (upslope) and the riparian community along the Stanislaus River (downslope). Blue oak (*Quercus douglasii*), interior live oak (*Quercus wislizeni*), and California buckeye (*Aesculus californica*) are the most common native species along the canal. Tree of heaven (*Ailanthus altissima*), a highly invasive introduced species, is locally common in some areas, especially towards the upstream portion of the canal section. Cottonwood (*Populus fremontii*) and willow (*Salix lasiolepis*) are relatively uncommon and were observed more towards the downstream portion of the canal segment. Large toyon (*Heteromeles arbutifolia*) shrubs are common throughout and are often intermixed with dense patches of poison oak (*Toxicodendron diversilobum*). Understory vegetation is predominantly nonnative grasses and weedy forbs such as rip gut brome (*Bromus diandrus*), foxtail barley (*Hordeum murinum*), and Italian thistle (*Carduus pycnocephalus*).

Six elderberry shrubs were identified and mapped along the canal segment; two are located on the south to southeast side of the canal, and four are located on the north to northwest side of the canal. The generalized locations of the shrubs are shown on the figure provided in Attachment 3. All of the shrubs observed are estimated to be within approximately 12 feet of the canal edge. No sign of VELB (*Desmocerus californicus dimorphus*) was evident in the shrub stems that could be examined. Many of the shrubs appeared to be in poor condition with minimal foliage and what appeared to be dead stems. Barr (1991) reported observing an increase in unhealthy plants later in the season (July), with many plants having yellowing, drooping leaves and dying young shoots. Munz and Keck (1959) and McMinn (1951) also suggest that *Sambucus* is a deciduous species in the dry season. It is therefore likely that the observed conditions may reflect seasonal water availability. The few shrubs that appeared to be in good condition were either located in cool, very shaded areas or were larger tress with, presumably, more extensive root systems.

A review of the California Natural Diversity Database (California Department of Fish and Game, 2010) identified a total of 14 reported occurrences of VELB adults, larvae, or exit

holes in the general region of the Project (Attachment 4). The nearest reported occurrence is approximately 9 miles east-northeast to the east near the intersection of Highway 120 and Highway 49. A single female was observed at this location on April 30, 2007. The habitat is described as a 5-inch-diameter (at breast height) elderberry shrub associated with live oak woodland intermixed with foothill pines (California Department of Fish and Game, 2010; VELB Occurrence #214).

Although detection of the presence of VELB is very difficult, and the specific habitat preferences have received limited studies, Barr (1991) suggests that VELB appears to prefer groups of elderberry shrubs or areas where scattered individuals are common rather than shrubs that are isolated, infrequent, or widely scattered. The few elderberry shrubs observed along the portion of the South Main Canal are infrequent and generally scattered. Barr (1991) found that such areas along the Stanislaus River showed no sign of VELB infestations. Although it may be possible for VELB to be present in this area, it appears to be suboptimal habitat.

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