Pixley Irrigation District

New Lateral 4 Facility and Deer Creek Check Structure Retrofit

Draft Initial Study/ Mitigated Negative Declaration

July 2019

Prepared for:
Pixley Irrigation District

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Acronyms and Abbreviations

AB .... Assembly Bill
CalEEMod .... California Emissions Estimator Model
Cal/OSHA .... California Division of Occupational Safety and Health
Caltrans .... California Department of Transportation
CARB .... California Air Resources Board
CAAQS .... California Ambient Air Quality Standards
CCR .... California Code of Regulations
CDFW .... California Department of Fish and Wildlife
CEC .... California Energy Commission
CEQA .... California Environmental Quality Act
CFR .... U.S. Code of Federal Regulations
CH_4 .... Methane
CNDDB .... California Department of Fish and Wildlife Natural Diversity Database
CNPS .... California Native Plant Society
CO .... Carbon Monoxide
CO_2e .... Carbon Dioxide Equivalent
DPM .... Diesel Particulate Matter
DTSC .... Department of Toxic Substance Control
DWR .... Department of Water Resources
EIR .... Environmental Impact Report
EPA .... U.S. Environmental Protection Agency
FEMA .... Federal Emergency Management Agency
GHG .... Greenhouse Gas
GIS .... Geographic Information System
IPaC .... U.S. Fish and Wildlife Service's Information for Planning and Consultation system
IS .... Initial Study
IS/MND .... Initial Study/Mitigated Negative Declaration
MMRP .... Mitigation Monitoring & Reporting Program
MND .... Mitigated Negative Declaration
MT CO_2e .... Metric Tons of Carbon Dioxide Equivalent
NAAQS .... National Ambient Air Quality Standards
ND .... Negative Declaration

NO_2 .... Nitrogen Dioxide
NOX .... Nitrogen Oxide
NRCS .... Natural Resources Conservation Service
O_3 .... Ozone
Pb .... Lead
ppb .... parts per billion
PM_{10} .... Particulate Matter less than 10 microns in diameter
$PM_{2.5}$ .... Particulate Matter less than 2.5 microns in diameter
Project .... Pixley Irrigation District Lateral 4 Deer Creek Project
SJVAB .... San Joaquin Valley Air Basin
SJVAPCD .... San Joaquin Valley Air Pollution Control District
SO_2 .... Sulfur Dioxide
SR .... State Route
SWRCB .... State Water Resources Control Board
SWPPP .... Storm Water Pollution Prevention Plan
TAC .... Toxic Air Contaminants
TPY .... Tons Per Year
USACE .... U. S. Army Corps of Engineers
USDA .... U. S. Department of Agriculture
USFWS .... U. S. Fish and Wildlife Service
USGS .... U. S. Geological Survey
WC .... Water Code

1 Introduction

Provost & Pritchard Consulting Group (Provost & Pritchard) has prepared this Initial Study/Mitigated Negative Declaration (IS/MND) on behalf of Pixley Irrigation District (District) to address the environmental effects of the New Lateral 4 Facility and Deer Creek Check Structure Retrofit Project (Project or proposed Project). This document has been prepared in accordance with the California Environmental Quality Act (CEQA), Public Resources Code Section 21000 *et.seq*. The District is the CEQA lead agency for this proposed Project.

The site and the proposed Project are described in detail in the **Project Description, Chapter 2**.

1.1 Regulatory Information

An Initial Study (IS) is a document prepared by a lead agency to determine whether a project may have a significant effect on the environment. In accordance with California Code of Regulations Title 14 (Chapter 3, Section 15000, *et seq*.)-- also known as the CEQA Guidelines-- Section 15064 (a)(1) states that an environmental impact report (EIR) must be prepared if there is substantial evidence in light of the whole record that the proposed Project under review may have a significant effect on the environment and should be further analyzed to determine mitigation measures or project alternatives that might avoid or reduce project impacts to less than significant levels. A negative declaration (ND) may be prepared instead if the lead agency finds that there is ***no*** substantial evidence in light of the whole record that the project may have a significant effect on the environment. An ND is a written statement describing the reasons why a proposed Project, not otherwise exempt from CEQA, would not have a significant effect on the environment and, therefore, why it would not require the preparation of an EIR (CEQA Guidelines Section 15371). According to CEQA Guidelines Section 15070, a ND or *mitigated* ND shall be prepared for a project subject to CEQA when either:

a. The IS shows there is no substantial evidence, in light of the whole record before the agency, that the proposed Project may have a significant effect on the environment, or

b. The IS identified potentially significant effects, but:

    1. Revisions in the project plans or proposals made by or agreed to by the applicant before the proposed MND and IS is released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur is prepared, and

    2. There is no substantial evidence, in light of the whole record before the agency, that the proposed Project *as revised* may have a significant effect on the environment.

1.2 Document Format

This IS/MND contains four chapters and four appendices. **Chapter 1, Introduction**, provides an overview of the proposed Project and the CEQA process. **Chapter 2, Project Description**, provides a detailed description of proposed Project components and objectives. **Chapter 3, Impact Analysis**, presents the CEQA checklist and environmental analysis for all impact areas, mandatory findings of significance, and feasible mitigation measures. If the proposed Project does not have the potential to significantly impact a given issue area, the relevant section provides a brief discussion of the reasons why no impacts are expected. If the proposed Project could have a potentially significant impact on a resource, the issue area discussion provides a description of potential impacts, and appropriate mitigation measures and/or permit requirements that would reduce those impacts to a less than significant level. **Chapter 4, Mitigation Monitoring and Reporting Program** (MMRP), provides the proposed mitigation measures, implementation timelines, and the entity/agency responsible for ensuring implementation.

The CalEEMod Output Files, Biological Evaluation Report, and Cultural Resources Information are provided as technical **Appendix A, Appendix B**, and **Appendix C**, respectively, at the end of this document.

The analyses of environmental impacts in **Chapter 3** are separated into the following categories:

Potentially Significant Impact. This category is applicable if there is substantial evidence that an effect may be significant, and no feasible mitigation measures can be identified to reduce impacts to a less than significant level. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

Less than Significant with Mitigation Incorporated. This category applies where the incorporation of mitigation measures would reduce an effect from a "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measure(s), and briefly explain how they would reduce the effect to a less than significant level (mitigation measures from earlier analyses may be cross-referenced).

Less Than Significant Impact. This category is identified when the proposed Project would result in impacts below the threshold of significance, and no mitigation measures are required.

No Impact. This category applies when a project would not create an impact in the specific environmental issue area. "No Impact" answers do not require a detailed explanation if they are adequately supported by the information sources cited by the lead agency, which show that the impact does not apply to the specific project (e.g. the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g. the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

2 Project Description

2.1 Project Background and Objectives

2.1.1 Project Title

New Lateral 4 Facility and Deer Creek Check Structure Retrofit

2.1.2 Lead Agency Name and Address

Pixley Irrigation District
357 East Olive Avenue
Tipton, CA 93272

2.1.3 Contact Person and Phone Number

Lead Agency Contact
Eric Limas, General Manager (559) 686-4716

CEQA Consultant
Provost & Pritchard Consulting Group
Amy M. Wilson, Environmental Project Manager
(559) 636-1166

2.1.4 Project Location

The Project is located in southern Tulare County, central California, approximately 216 miles southeast of Sacramento and 40 miles northwest of Bakersfield (see **Figure 2-1**). The Project site is located west of State Route 99 (SR 99) and northeast of State Route 43 (SR 43) and more specifically, the Lateral 4 alignment and basin alternatives will run primarily along the Road 116 alignment. The Check Structure is within Deer Creek, just west of SR 99. Lateral 4 and the Deer Creek Check Structure locations are shown in **Figure 2-2, Figure 2-3, and Figure 2-4**.

2.1.5 Latitude and Longitude

Center of the Lateral 4 System (phase one): 36.000422, -119.362306
Deer Creek Check Structure (phase two): 35.913612, -119.282092

2.1.6 General Plan Designation

Valley Agriculture

2.1.7 Zoning

Exclusive Agriculture (AE-40) (**Figure 2-5,** and **Figure 2-6**)

2.1.8 Description of Project

2.1.8.1 District Background

The Pixley Irrigation District (District) was formed in 1958 and is an agricultural irrigation district which covers over 69,500 acres, and over 67 miles of canals and rivers in southern Tulare County. Deer Creek, a local ephemeral stream, flows from east to west through the middle of the District. The District enjoys excellent groundwater quality. Depths to static groundwater within the District average approximately 300 feet.

2.1.8.2 Project Description

The District recently performed a feasibility study for developing surface water delivery system alternatives for the northwestern portion of the District. This area of the District does not have access to surface water and therefore is entirely reliant on groundwater pumping. The District is pursing development of the surface water delivery system in phases. The first phase is to develop an open channel, gravity conveyance system beginning from the end of the existing West Main Canal and terminating in one of the basin alternatives. The facility will primarily run along the Avenue 116 alignment starting at Road 116 and end between Road 84 and Road 76, with two basin alternatives. Alternative one is the Road 84 basin, and alternative two is the Road 76 basin. Additionally, as a second phase, the District is pursuing options to retrofit the Deer Creek Check Structure with an automated gate system for better managing Friant water flows in Deer Creek for beneficial use within the District.

2.1.8.3 Construction

Construction of the Project will be completed in two phases. Phase one (Lateral 4 and basin) is anticipated to be completed within two years (pending funding), which will include grading, site preparation, trenching, connection to the existing distribution system, and development of a terminal basin (either alternative one or alternative two).

Phase two (Deer Creek Check Structure Retrofit) is anticipated to be completed within two months from the start of construction. Construction will involve installation of the new automatic gates into the check structure for automation. All construction will take place within the already disturbed channel.

Generally, construction will occur between the hours of 7am and 5pm, Monday through Friday, excluding holidays. Construction will require temporary staging and storage of materials and equipment. Construction equipment will likely include excavators, backhoes, graders, skid steers, loaders, and hauling trucks. Staging areas will be located onsite.

Although construction is not expected to generate hazardous waste, field equipment used during construction has the potential to contain various hazardous materials such as diesel fuel, hydraulic oil, grease, solvents, adhesives, paints, and other petroleum-based products.

2.1.8.4 Operation and Maintenance

Operation and maintenance of the Lateral 4 canal, the terminal basin, and the retrofitted Deer Creek Check Structure, will take place at several different times during the year. Annually any major repairs that are needed are done when there is no water running. Every other year the basin will be tilled, and any minor repairs or maintenance, such as erosion control, vegetation removal and minor structure repairs are done on an as needed basis. Trips generated by operation and maintenance activities would be minimal.

2.1.9 Surrounding Land Uses and Setting

Project areas are predominantly surrounded by agricultural lands, fallow fields, ruderal compacted dirt access roads, weedy ruderal lots, various excavated canals, basins, dairy lagoons and associated infrastructure, and scattered rural residences[1]. The Deer Creek Check Structure is located within Deer Creek and SR 99 is directly to the east of the structure.

2.1.10 Other Public Agencies Whose Approval May Be Required

Discretionary approvals that may be required:

- San Joaquin Valley Air Pollution Control District – rules and regulations (Regulation VIII, Rule 9510, Rule 4641)

2.1.11 Consultation with California Native American Tribes

Assembly Bill 52 (AB 52; codified at Public Resources Code Section 21080.3.1, *et seq.*) requires that a lead agency, within 14 days of determining that it will undertake a project, must notify in writing any California Native American Tribe traditionally and culturally affiliated with the geographic area of the project if that Tribe has previously requested notification about projects in that geographic area. The notice must briefly describe the project and inquire whether the Tribe wishes to initiate request formal consultation. Tribes have 30 days from receipt of notification to request formal consultation. The lead agency then has 30 days to initiate the consultation, which then continues until the parties come to an agreement regarding necessary mitigation or agree that no mitigation is needed, or one or both parties determine that negotiation occurred in good faith, but no agreement will be made.

The District has received a letter from the Santa Rosa Rancheria Tachi Yokut Tribe pursuant to Public Resources Code Section 21080.3.1 requesting notification of proposed projects. The Santa Rosa Rancheria Tachi Yokut Tribe has already been contacted in regards to this Project, as discussed in sections 3.5 and 3.18 of Chapter 3. As part of meeting the specific AB 52 compliance a second letter will be sent to the tribe on District letterhead.

[1] Appendix B – Biological Evaluation Report. Page 2-17.

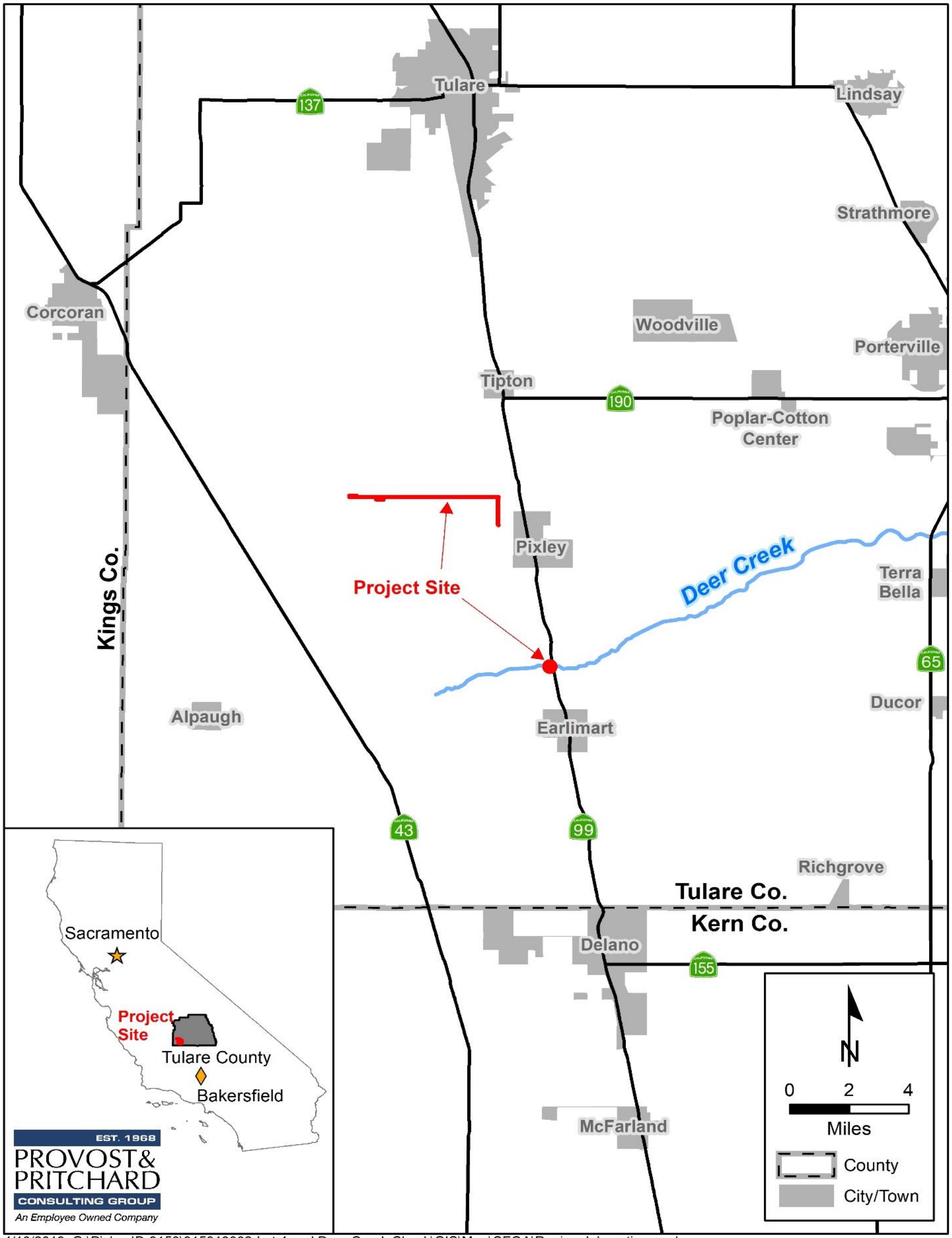

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Figure 2-1. Regional Location

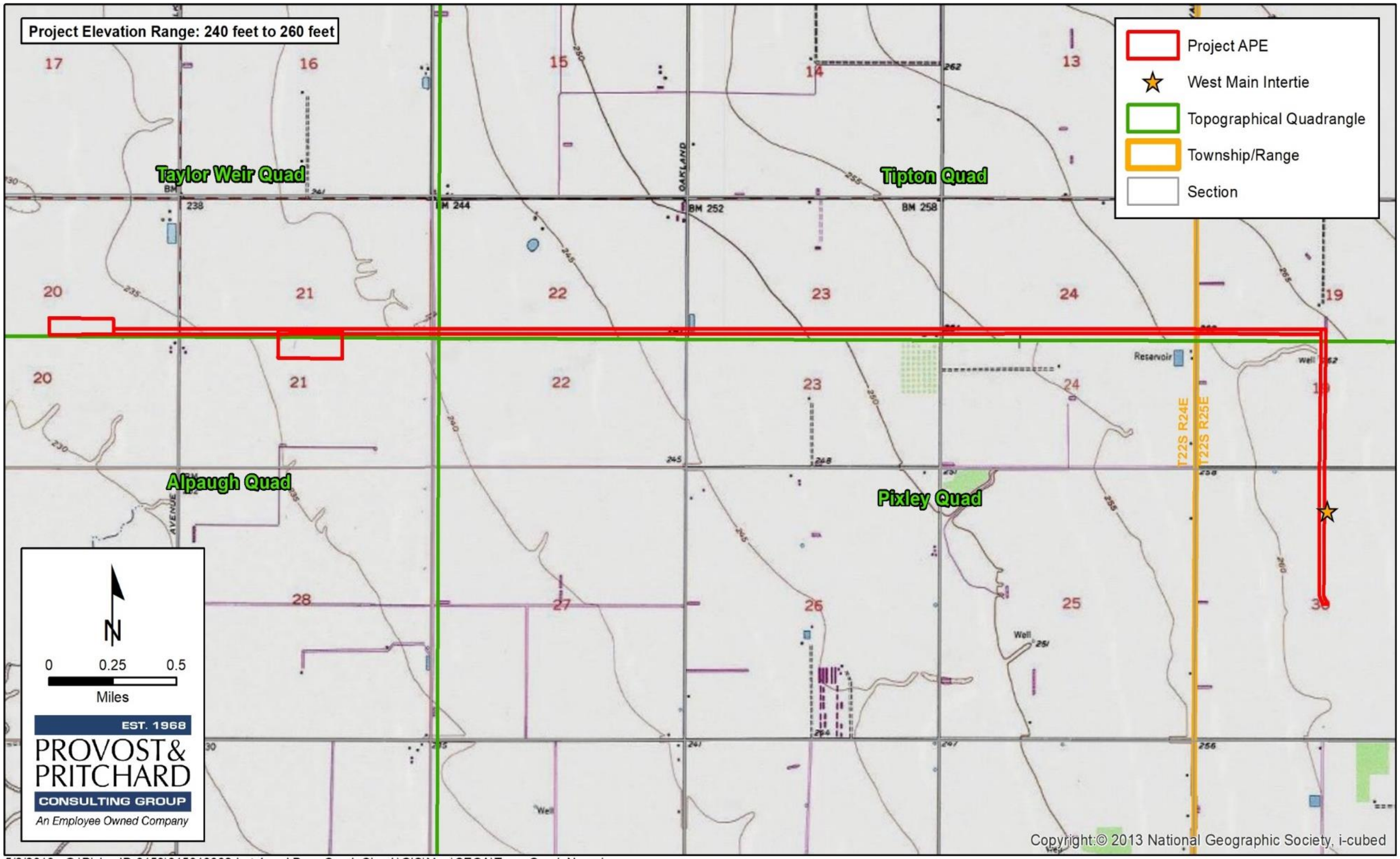

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Figure 2-2. Topographic Quadrangle Map - North

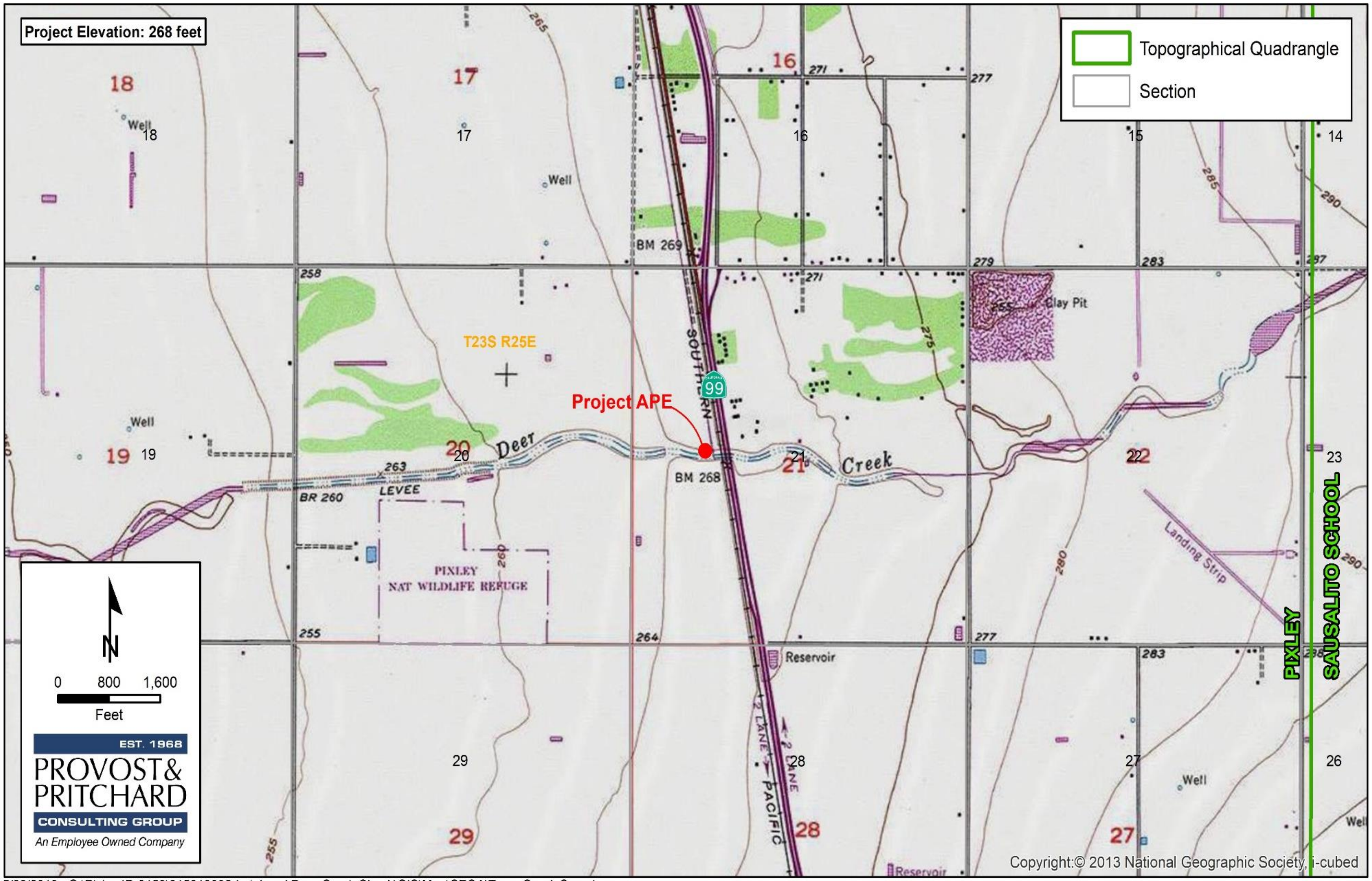

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Figure 2-3. Topographic Quadrangle Map - South

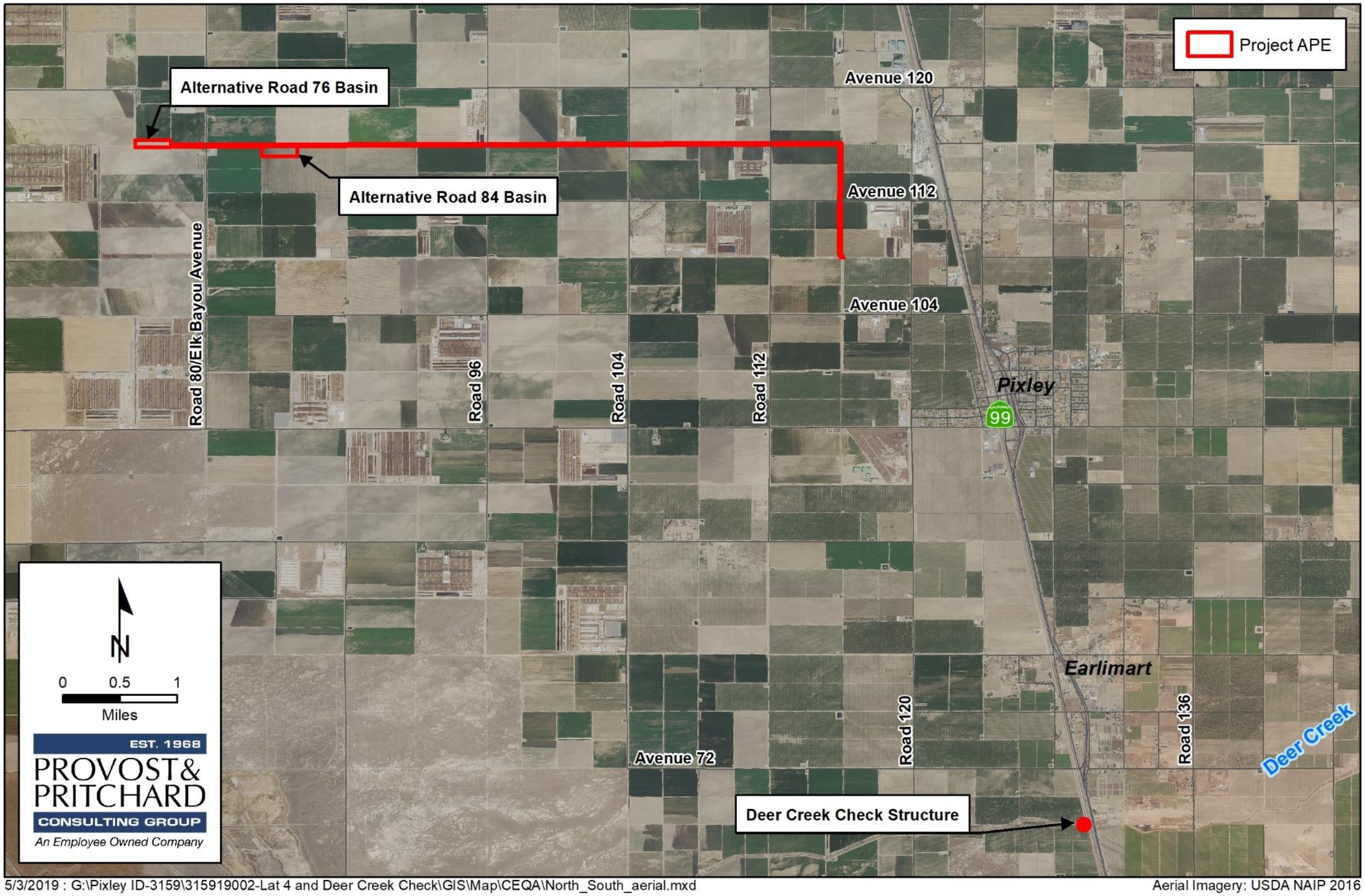

Figure 2-4. Aerial APE Map

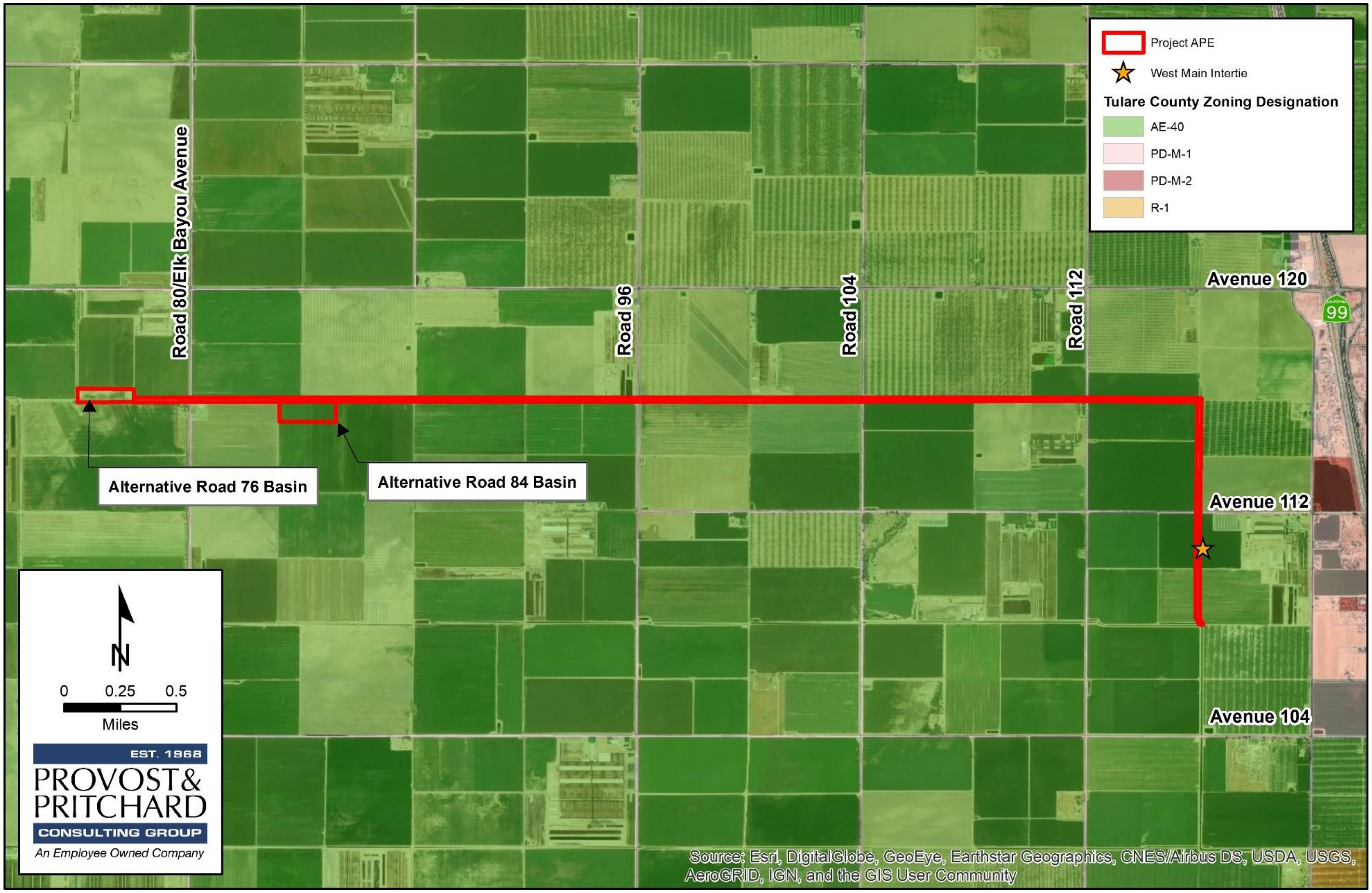

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Figure 2-5. Tulare County Zone District Map (Lateral 4).

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Figure 2-6. Tulare County Zone District Map (Deer Creek Check Structure).

Environmental Factors Potentially Affected

The environmental factors checked below would be potentially affected by this project, as indicated by the checklist and subsequent discussion on the following pages.

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

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

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

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

Signature   Date: 6/28/19

Eric Limas, General Manager

Printed Name/Position

3 Impact Analysis

3.1 Aesthetics

Table 3-1. Aesthetics Impacts

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

3.1.1 Environmental Setting

The Project is located in the southern portion of Tulare County in the Central San Joaquin Valley. Lands within the vicinity of Lateral 4 consist of relatively flat irrigated farmland, water infrastructure, basins, and dairies. Within the vicinity of the Deer Creek Check Structure are flat irrigated farmland, Deer Creek, The Union Pacific Railroad and State Route 99 (SR 99). In Tulare County, a portion of State Route 180 (SR 180) has been officially identified by Caltrans as a "designated State Scenic Highway;" however, that segment is approximately 52 miles northeast of the Project. The Project is located approximately 35 miles east of the foothills of the Coast Range and approximately 20 miles west of the foothills of the Sierra Nevada. Neither of these foothills or mountain ranges are typically visible from the vantage point of either Project phase, even on a clear day. The proposed lateral will be an open channel with berms up to five feet tall, both basin alternatives would also have berms no higher than 5 feet tall. The Deer Creek Check Structure retrofitting will not increase the height or footprint of the structure. All elements of the proposed Project will be consistent with the aesthetics of the area.

3.1.2 Impact Assessment

I-a) Would the project have a substantial adverse effect on a scenic vista?

a) Less Than Significant Impact. Scenic features in the Project's vicinity may include the vast expanse of agricultural uses and Deer Creek. The Project will not interfere with public views of the Sierra Nevada foothills during construction or operation as the Project is not within the viewshed of any scenic vistas nor would the views of the Sierra Nevada Mountains or Coastal Range be obstructed regardless of air quality. Impacts from construction will be minimal and temporary in nature. Furthermore, the Project site, at both the Lateral 4 location, and the Deer Creek check structure, does not stand out from its surroundings in any remarkable fashion. Any impacts would be less than significant.

I-b) Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

b) No Impact. The Scenic Highway Program[2] was created to preserve and protect scenic highway corridors from change would diminish the aesthetic value of lands adjacent to highways. A highway may be officially designated "scenic" depending upon how much of the natural landscape can be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes upon the traveler's enjoyment of the view.

There are no trees, rock outcroppings, or historical buildings near a designated state scenic highway that would be substantially damaged by the Project. In Tulare County, a 4.5-mile portion of SR180 has been officially identified by Caltrans as a "designated State Scenic Highway". This segment is approximately 52 miles northeast of the Project. Any Project activities would not have the potential to affect the scenic highway. There would be no impact.

I-c) Would the project, in non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings?(Public view are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

c) Less Than Significant Impact. The current visual character of the Project site is agriculture with irrigation infrastructure/basins and Deer Creek. Project will not substantially affect the visual characteristics of the area and is consistent with the visual character of the surrounding area. Additionally, the Project does not conflict with the onsite zoning designation and will abide by the Tulare County policy PFS-4.5, which will require that stormwater detention/retention basins be visually unobtrusive[3]. Therefore, any impacts would be less than significant.

I-d) Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

d) Less Than Significant Impact. The Project is primarily surrounded by irrigated farmland, water infrastructure, basins, dairies, Deer Creek, and transportation corridors. As mentioned in **Section 2.1.8.3**, construction will likely occur between the hours of 7:00 am to 5:00 pm, Monday through Friday. Additional, vehicular traffic after construction will be limited to maintenance and monitoring on an as-needed basis, which will be performed during daylight hours, except in an unforeseen emergency situation. Furthermore, if lighting were to occur, it will be directed downward or hooded as to prevent artificial lighting from illuminating adjacent natural areas, Tulare County General Plan Policies ERM-1.15.[4] Additional vehicular traffic during operation will be limited to operation and maintenance on an as-needed basis which will be performed during daylight hours, except in an unforeseen emergency situation. Therefore, the Project will not create a new source of substantial light or glare that would adversely affect day or nighttime views in the area or be inconsistent with existing conditions, any impacts would be less than significant.

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[2] State Scenic Highways https://leginfo.legislature.ca.gov/faces/codes_displayexpandedbranch.xhtml?tocCode=SHC&division=1.&title=&part=&chapter=&article= Accessed March 29, 2019.

[3] Tulare County General Plan, Public Facilities and Services, Page 14-8 http://generalplan.co.tulare.ca.us/documents/GP/001Adopted%20Tulare%20County%20General%20Plan%20Materials/000General%20Plan%202030%20Part%20I%20and%20Part%20II/GENERAL%20PLAN%202012.pdf Accessed March 29, 2019

[4] Tulare County General Plan, Environmental Resources Management Page 8-10 http://generalplan.co.tulare.ca.us/documents/GP/001Adopted%20Tulare%20County%20General%20Plan%20Materials/000General%20Plan%202030%20Part%20I%20and%20Part%20II/GENERAL%20PLAN%202012.pdf Accessed March 29, 2019

3.2 Agriculture and Forestry Resources

Table 3-2. Agriculture and Forest Resources Impacts

Agriculture and Forest Resources				
Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☒	☐
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☒	☐
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☒	☐

3.2.1 Environmental Setting

The Project is located in the California's Central San Joaquin Valley in Tulare County. Tulare County is located within California's agricultural heartland. For crop year 2016-2017, Tulare County ranked second for the top agricultural counties in the State in the estimated value of agricultural production, which is 7.04 billion dollars.[5]

A wide range of commodities are grown in the county, with major production of milk, poultry, livestock, and other animal commodities, row crops, nuts and fruit tree crops, and vegetables. Rich soil, irrigation water, Mediterranean climate and steady access to local, national and global markets make this possible.

[5] USDA. California County Agricultural Commissioners' Reports 2016-2017. https://www.nass.usda.gov/Statistics_by_State/California/Publications/AgComm/2017/2017cropyearcactb00.pdf Accessed April 1, 2019.

3.2.2 Impact Assessment

II-a) Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

a) Less Than Significant Impact. The Farmland Mapping and Monitoring Program[6] produces maps and statistical data used for analyzing impacts to California's agriculture resources. These maps are updated on a biennial basis with the use of a computer mapping system, aerial imagery, public review, and field reconnaissance. The farmland maps identify eight land use categories, five of which are agriculture related: prime agriculture, farmland of statewide importance, unique farmland, farmland of local importance, and grazing land. The land use categories onsite and in the proximity of the Project are summarized below:

- *PRIME FARMLAND (P): Farmland with the best combination of physical and chemical features able to sustain long term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.*
- *FARMLAND OF STATEWIDE IMPORTANCE (S): Farmland similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.*
- *FARMLAND OF LOCAL IMPORTANCE (L): Land of importance to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee.*
- *CONFINED ANIMAL AGROICULTURE (Cl): This includes aquaculture dairies, feedlots, and poultry facilities. Confined Animal Agriculture qualities for Farmland of Local Importance in Fresno County.*
- *VACANT OR DISTRUBED LAND (V): This consists of open filed areas that do not qualify for an agricultural category, mineral and oil extraction areas, and rural freeway interchanges.*
- *UNIQUE FARMLAND (U): Farmland of lesser quality soils used for the production of the state's leading agricultural crops. This land is usually irrigated but may include non- irrigated orchards or vineyards as found in some climatic zones in California. Land must have been cropped at some time during the four years prior to the mapping date.*

As demonstrated in **Figure 3-1**, the Farmland Mapping and Monitoring Program for Tulare County designates Alternative Road 76 Basin is designated as Vacant or Disturbed Land and Alternative Road 86 Basin is designated as Farmland of State Importance. The lateral 4 is designated as Prime Farmland, Confined Animal Agriculture, Semi-Agriculture and Rural Commercial, and Farmland of State Importance. As demonstrated in **Figure 3-2**, the second phase is designated as Unique Farmland. Although the first phase is designated within farmland classifications, the only Project component that would take agricultural uses out of production is Alternative Road 84 Basin. Alternative Road 76 Basin will be located on vacant property. Lateral 4 will be located primarily within the right-of-way of a dirt road, however, just east of the lateral 4 intersection and Road 112, it passes through an agricultural field for approximately 0.65 miles. The second phase only involves retrofitting the existing check structure with automated gates for better managing Friant water flows in Deer Creek for beneficial use within the District.

The Project area is zoned AE-40 (Exclusive Agriculture, 40-acre minimum) and planned as Valley Agriculture by the Tulare County General Plan. Implementation of the Project will provide access to surface water for the northwestern portion of Pixley Irrigation District, which has historically relied on groundwater pumping. Furthermore, the Project will not change, alter, or convert the intrinsic farmland characteristics or value, for on-going or future agricultural activities should the Project use be abandoned. The impact will be less than significant.

[6] Department of Conservation Farmland Mapping & Monitoring Program https://www.conservation.ca.gov/dlrp/fmmp Accessed April 1, 2019

II-b) Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?

b) Less Than Significant. The Project area is zoned AE-40 (Exclusive Agriculture, 40-acre minimum) according to Tulare County' Zoning map. Chapter 3, Section 9.7 of the Tulare County Zoning Ordinance addresses the AE-40 zone district. Section 9.7 does not specifically list "basins" or "open channel" as a permitted use. Conversely, Section 16 of the Zoning Ordinance addresses uses requiring a Special Conditional) Use Permit does not identify "basins" or "open channel" as requiring a Special Use Permit. This Project will function as an ancillary use to agricultural operations in that they will store surface water diverted into the area.

The lack of regulation for basins and open channels in the Tulare County Zoning Ordinance is supported by Government Code Section 53091(e), which states that zoning ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water, or for the production or generation of electrical energy, facilities that are subject to Section 12808.5 of the Public Utilities Code, or electrical substations in an electrical transmission system that receives electricity at less than 100,000 volts.[7]

The entire Project spans across portions of 31 parcels. There are 17 unique Williamson Act contracts for 31 parcels. The objective of the Williamson Act program includes: protection of agricultural resources, preservation of open space land, and promotion of efficient urban growth patterns. The Project intent is to diversify water supply resources and improve groundwater sustainability and reliability within the Pixley Irrigation District, which has historically relied on groundwater pumping in the proposed Project area. The open channel and the selected basin alternative will facilitate a conveyance and storage system for surface water from the West Main Canal. This inherently promotes Williamson Act objectives of preserving open space and agricultural activities by preventing the fallowing of other agriculturally productive lands by making water resources more available to growers. Furthermore, during construction of the second phase (retro fit of the Deer Creek check structure), construction will not take place on agricultural property. Any impacts will be less than significant.

II-c) Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))? and

II-d) Would the project result in the loss of forest land or conversion of forest land to non-forest use?

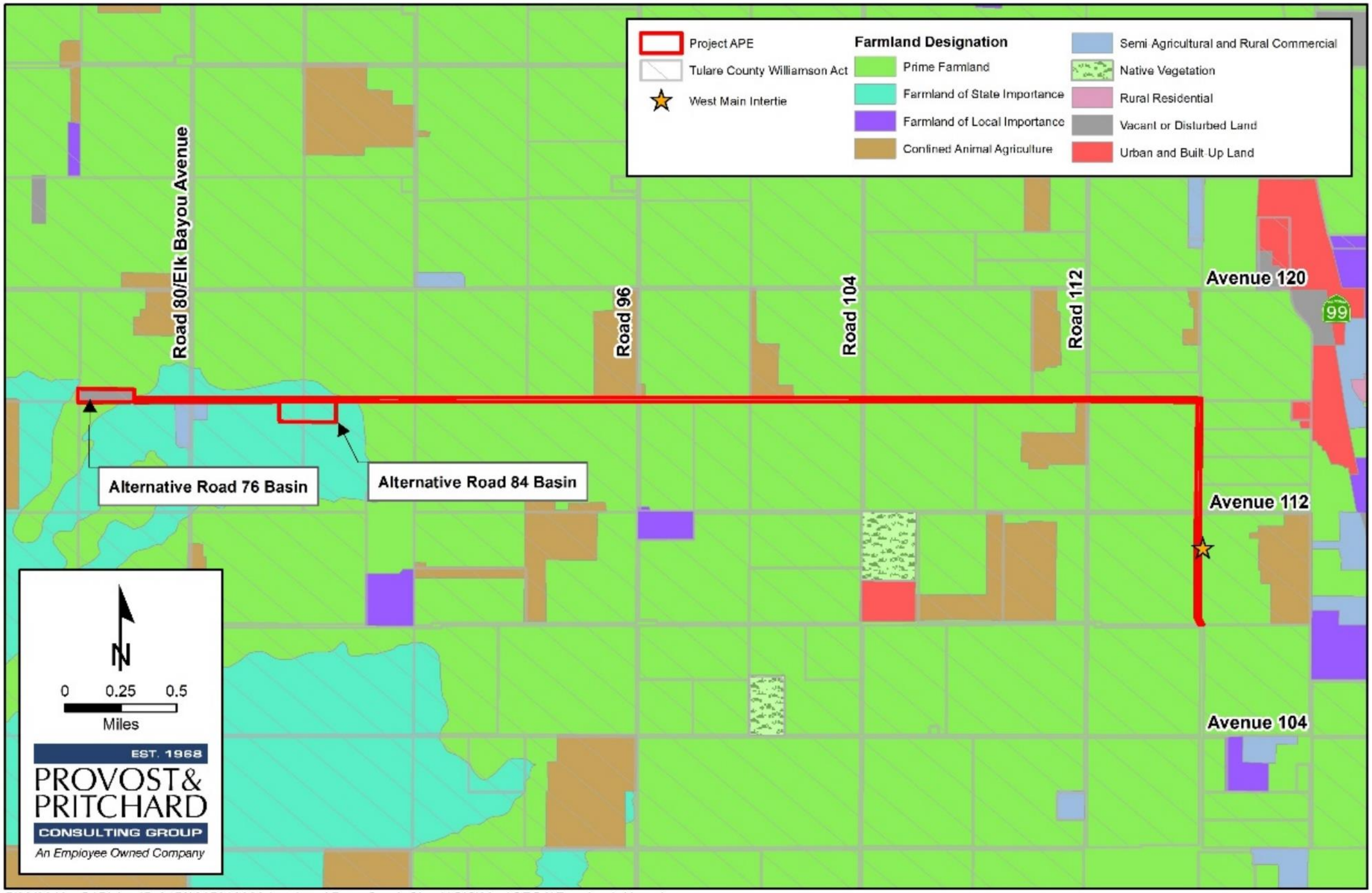
c and d) No Impact. There are no forest lands or timberlands within the Project site or vicinity. Therefore, there will be no impact.

II-e) Would the project involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?

e) Less Than Significant. As discussed above in Impact Assessments IIa-d, the Project involves the development one of two basin alternatives, lateral 4, and the retrofitting of an existing Deer Creek Check Structure. A portion of lateral 4 and the entire Road 84 basin alternative will be located on farmland. The Project will allow the District to supply surface water rather than rely solely on groundwater pumping. As a result, the Project will result in the continued farming on agricultural lands that otherwise may be negatively affected due to a lack of water resources. Therefore, the Project is not converting the farmland to a

[7] California Legislative Information https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=GOV&sectionNum=53091 Accessed April 1, 2019

permanent non-farmland use. There is no forest or timberland located on or near the Project, nor is the site zoned for forest land or timberland. Any impacts would be less than significant.



5/22/2019 : G:\Pixley ID-3159\315919002-Lat 4 and Deer Creek Check\GIS\Map\CEQA\Farmland_N.mxd

Figure 3-1. Farmland Designation Map (North)

Figure 3-2. Farmland Designation Map (South)

3.3 Air Quality

Table 3-3. Air Quality Impacts

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

3.3.1 Environmental Setting

The Project lies within the eight-county San Joaquin Valley Air Basin (SJVAB), which is managed by the San Joaquin Valley Air Pollution Control District (SJVAPCD). Air quality in the SJVAB is influenced by a variety of factors, including topography, local and regional meteorology. National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) have been established for the following criteria pollutants: carbon monoxide (CO), ozone (O_3), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), particulate matter (PM_{10} and $PM_{2.5}$), and lead (Pb). The CAAQS also set standards for sulfates (SO_4), hydrogen sulfide (H_2S), vinyl chloride (C_2H_3Cl) and visibility.

Air quality plans or attainment plans are used to bring the applicable air basin into attainment with all State and Federal ambient air quality standards designed to protect the health and safety of residents within that air basin. Areas are classified under the Federal Clean Air Act as either "attainment", "nonattainment", or "extreme nonattainment" areas for each criteria pollutant based on whether the NAAQS have been achieved or not. Attainment relative to the State standards is determined by the California Air Resources Board (CARB). The San Joaquin Valley is designated as a State and Federal nonattainment area for O_3, a State and Federal nonattainment area for $PM_{2.5}$, a State nonattainment area for PM_{10}, a Federal and State attainment area for CO, SO_2, and NO_2, and a State attainment area for sulfates, vinyl chloride and Pb[8].

[8] San Joaquin Valley Air Pollution Control District. Ambient Air Quality Standards and Valley Attainment Status. http://www.valleyair.org/aqinfo/attainment.htm. Accessed April 1, 2019

3.3.2 Methodology

An Air Quality and Greenhouse Gas Emissions Output File (**Appendix A**) was prepared using CalEEmod, Version 2016.3.2 for the Project in April 2019. The sections below detail the methodology of the air quality and greenhouse gas emissions report and its conclusions.

3.3.2.1 Short-Term Construction-Generated Emissions

Short-term construction emissions associated with the Project were calculated using CalEEmod, Version 2016.3.2. The emissions modeling includes emissions generated by off-road equipment, haul trucks, and worker commute trips. Emissions were quantified based on anticipated construction schedules provided by the Project applicant. All remaining assumptions were based on the default parameters contained in the model. Localized air quality impacts associated with the Project would be minor and were qualitatively assessed. Modeling assumptions and output files are included in **Appendix A**.

3.3.2.2 Long-Term Operational Emissions

Long-term operational emissions associated with the Project are estimated to be minimal in nature. Maintenance will be provided on an as needed basis by existing staff, and the operational equipment, such as automated gates, will be similar to the existing system which results in negligible emissions. Modeling assumptions and output files are included in **Appendix A**.

3.3.2.3 Thresholds of Significance

To assist local jurisdictions in the evaluation of air quality impacts, the SJVAPCD has published the *Guide for Assessing and Mitigating Air Quality Impacts*. This guidance document includes recommended thresholds of significance to be used for the evaluation of short-term construction, long-term operational, odor, toxic air contaminant, and cumulative air quality impacts. Accordingly, the SJVAPCD-recommended thresholds of significance are used to determine whether implementation of the proposed Project would result in a significant air quality impact. Projects that exceed these recommended thresholds would be considered to have a potentially significant impact to human health and welfare. The thresholds of significance are summarized, as follows:

Short-Term Emissions of Particulate Matter (PM_{10}): Construction impacts associated with the Project would be considered significant if the feasible control measures for construction in compliance with Regulation VIII as listed in the SJVAPCD guidelines are not incorporated or implemented, or if project-generated emissions would exceed 15 tons per year (TPY).

Short-Term Emissions of Ozone Precursors (ROG and NOx): Construction impacts associated with the Project would be considered significant if the project generates emissions of Reactive Organic Gases (ROG) or NO_X that exceeds 10 TPY.

Long-Term Emissions of Particulate Matter (PM10): Operational impacts associated with the Project would be considered significant if the project generates emissions of PM_{10} that exceed 15 TPY.

Long-Term Emissions of Ozone Precursors (ROG and NOx): Operational impacts associated with the Project would be considered significant if the project generates emissions of ROG or NO_X that exceeds 10 TPY.

Conflict with or Obstruct Implementation of Applicable Air Quality Plan: Due to the region's nonattainment status for ozone, $PM_{2.5}$, and PM_{10}, if the project-generated emissions of either of the ozone precursor pollutants (i.e., ROG and NO_x) or PM_{10} would exceed the SJVAPCD's significance thresholds, then the project would be considered to conflict with the attainment plans. In addition, if the project would result in a change in land use and corresponding increases in vehicle miles traveled, the project may result in an increase in vehicle miles traveled that is unaccounted for in regional emissions inventories contained in regional air quality control plans.

Local Mobile-Source CO Concentrations: Local mobile source impacts associated with the Project would be considered significant if the project contributes to CO concentrations at receptor locations in excess of the CAAQS (i.e. 9.0 ppm for 8 hours or 20 ppm for 1 hour).

Exposure to toxic air contaminants (TAC) would be considered significant if the probability of contracting cancer for the Maximally Exposed Individual (i.e., maximum individual risk) would exceed 10 in 1 million or would result in a Hazard Index greater than 1.

Odor impacts associated with the Project would be considered significant if the project has the potential to frequently expose members of the public to objectionable odors.

3.3.2.4 Attainment Status

Table 3-4. Summary of Ambient Air Quality Standards and Attainment Designation

Summary of Ambient Air Quality Standards & Attainment Designation					
Pollutant	Averaging Time	California Standards*		National Standards*	
		Concentration*	Attainment Status	Primary	Attainment Status
Ozone (O_3)	1-hour	0.09 ppm	Nonattainment/ Severe	–	No Federal Standard
	8-hour	0.070 ppm	Nonattainment	0.075 ppm	Nonattainment (Extreme)**
Particulate Matter (PM_{10})	AAM	20 µg/m^3	Nonattainment	–	Attainment
	24-hour	50 µg/m^3		150 µg/m^3	
Fine Particulate Matter ($PM_{2.5}$)	AAM	12 µg/m^3	Nonattainment	12 µg/m^3	Nonattainment
	24-hour	No Standard		35 µg/m^3	
Carbon Monoxide (CO)	1-hour	20 ppm	Attainment/ Unclassified	35 ppm	Attainment/ Unclassified
	8-hour	9 ppm		9 ppm	
	8-hour (Lake Tahoe)	6 ppm		–	
Nitrogen Dioxide (NO_2)	AAM	0.030 ppm	Attainment	53 ppb	Attainment/ Unclassified
	1-hour	0.18 ppm		100 ppb	
Sulfur Dioxide (SO_2)	AAM	–	Attainment	--	Attainment/ Unclassified
	24-hour	0.04 ppm		--	
	3-hour	–		0.5 ppm	
	1-hour	0.25 ppm		75 ppb	
Lead (Pb)	30-day Average	1.5 µg/m^3	Attainment	–	No Designation/ Classification
	Calendar Quarter	–		--	
	Rolling 3-Month Average	–		0.15 µg/m^3	
Sulfates (SO_4)	24-hour	25 µg/m^3	Attainment	No Federal Standards	
Hydrogen Sulfide (H_2S)	1-hour	0.03 ppm (42 µg/m^3)	Unclassified		
Vinyl Chloride (C_2H_3Cl)	24-hour	0.01 ppm (26 µg/m^3)	Attainment		
Visibility-Reducing Particle Matter	8-hour	Extinction coefficient: 0.23/km-visibility of 10 miles or more due to particles when the relative humidity is less than 70%.	Unclassified		

** For more information on standards visit: http//www.arb.ca.gov.research/aaqs/aaqs2.pdf*
*** No Federal 1-hour standard. Reclassified extreme nonattainment for the Federal 8-hour standard May 5, 2010.*
****Secondary Standard*
Source: CARB 2015; SJVAPCD 2015

3.3.3 Impact Assessment

III-a) Would the project conflict with or obstruct implementation of the applicable air quality plan?

a) No Impact. As noted in Impact Assessments III-b and III-c below, implementation of the Project would not result in short-term or long-term increases in emissions that would exceed applicable thresholds of significance. Projects that do not exceed the recommended thresholds would not be considered to conflict with or obstruct the implementation of any applicable air quality plans. Therefore, there would be no impact.

III-b) Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?

b) Less Than Significant Impact.

Short-Term Construction-Generated Emissions

Construction-generated emissions are temporary in duration, taking place over 26 months, during times when water is not running. Work will include site preparation, grading, trenching, connection to the existing West Main Canal, and development of one of the terminal basin alternatives, and retrofitting the Deer Creek Check Structure. The construction of the Project would result in the temporary generation of emissions associated with construction activities, motor vehicle exhaust associated with construction equipment and worker trips, as well as the movement of construction equipment on unpaved surfaces.

Estimated construction-generated emissions and operational emissions are summarized in **Table 3-5** and **Table 3-6**, respectively.

Table 3-5. Short-Term Construction-Generated Emissions of Criteria Air Pollutants

Short-Term Construction-Generated Emissions of Criteria Air Pollutants					
Source	Annual Emissions (Tons/Year) [1]				
	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$
2019	0.1185	1.1826	0.7460	0.0632	0.0562
2020	0.5557	5.8900	3.5476	0.9800	0.5953
2021	0.5112	5.5514	3.7586	0.6727	0.4114
Maximum Annual Proposed Project Emissions:	0.5557	5.8900	3.7586	0.9800	0.5953
SJVAPCD Significance Thresholds:	*10*	*10*	*100*	*15*	*15*
Exceed SJVAPCD Thresholds?	*No*	*No*	*No*	*No*	*No*

1. *Emissions were quantified using CalEEmod Output Files Version 2016.3.2. Refer to Appendix A for modeling results and assumptions. Totals may not sum due to rounding.*

Table 3-6. Unmitigated Long-Term Operational Emissions

Long-Term Operational Emissions of Criteria Air Pollutants					
	Annual Emissions (Tons/Year) (1)				
Source	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$
Maximum Annual Project Emissions:	0.3204	0.00001	0.00079	0	0
SJVAPCD Significance Thresholds:	*10*	*10*	*100*	*15*	*15*
Exceed SJVAPCD Thresholds?	*No*	*No*	*No*	*No*	*No*

1. *Emissions were quantified using CalEEmod Output Files Version 2016.3.2. Refer to Appendix A for modeling results and assumptions. Totals may not sum due to rounding.*

It is important to note that the Project would be required to comply with SJVAPCD Regulation VIII (Fugitive PM_{10} Prohibitions). Mandatory compliance with SJVAPCD Regulation VIII would further reduce emissions of fugitive dust from the Project site, and adequately minimize the Project's potential to adversely affect nearby sensitive receptors to localized PM impacts.

Given that project-generated emissions would not exceed applicable SJVAPCD significance thresholds and the Project would be required to comply with SJVAPCD Regulation VIII, construction-generated emissions of criteria pollutants would be considered less than significant.

Long-Term Operational Emissions

Long-term operational emissions associated with the Project will be minimal. Maintenance will continue to be provided on an as needed basis. Therefore, no impacts are anticipated for operational Project-related impacts to air quality.

As a whole, any cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard would be considered less than significant.

III-c) Would the project expose sensitive receptors to substantial pollutant concentrations?

c) Less Than Significant Impact.

The Guide for Assessing and Mitigating Air Quality Impacts (GAMAQI), published by the SJVAPCD, defines a sensitive receptor as people that have an increased sensitivity to air pollution or environmental contaminates. Sensitive receptors locations include schools, parks, and playgrounds, daycare centers, nursing homes, hospitals, and residential dwelling unit(s).[9] Via an aerial search, there are four Single-Family residences within the phase's vicinity. The nearest Single-Family residence is approximately 100 feet south of phase. Via an aerial search, the nearest sensitive receptor (Single-Family residence) to the second phase is approximately 570 feet east of the phase. Nearby land uses, of both Project portions, are comprised of agricultural uses and several dairies.

Toxic Air Contaminants

Toxic Air Contaminants, in California, are regulated primarily by AB 1807 (Tanner Air Toxics Act) and AB 2588 (Air Toxics Hot Spots Information and Assessment Act of 1987). The Tanner Air Toxics Act sets forth a formal procedure for CARB to designate substances as TACs. This includes research, public participation, and scientific peer review before CARB designates a substance as a TAC.

[9] Guide for Assessing and Mitigating Air Quality impacts, Page 10, http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf Accessed April 1, 2019

Implementation of the Project would not result in the long-term operation of any major onsite stationary sources of TACs, nor would Project implementation result in a substantial increase in vehicle trips along area roadways, in comparison to existing conditions. However, construction of the Project may result in temporary increases in emissions of diesel-exhaust particulate matter (DPM) associated with the use of off-road diesel equipment. More than 90% of DPM is less than one µm in diameter, and thus is a subset of $PM_{2.5}$.[10] Health-related risks associated with diesel-exhaust emissions are primarily associated with long-term exposure and associated risk of contracting cancer. As such, the calculation of cancer risk associated with exposure of to TACs are typically calculated based on a long-term (e.g., 70-year) period of exposure. The use of diesel-powered construction equipment, however, would be temporary and episodic. Construction activities would occur over an approximate two year and two-month period, which would be approximately 4 percent of the typical 70-year exposure period. As a result, exposure to construction generated DPM would not be anticipated to exceed applicable thresholds (i.e. incremental increase in cancer risk of 10 in one million).

Construction of the Project is not anticipated to result in a substantial increase in DPM or other TACs. As indicated in **Table 3-5**, construction of the Project would generate maximum unmitigated annual emissions of approximately 0.5953 tons/year of $PM_{2.5}$, which includes DPM. During operation, the Project is not anticipated to generate any $PM_{2.5}$, as illustrated in **Table 3-6**. Project-related impacts to sensitive receptors would be less than significant.

Naturally Occurring Asbestos

Naturally occurring asbestos, which was identified by CARB as a TAC in 1986, is located in many parts of California and is commonly associated with ultramafic rock. The Project site is not located near any areas that are likely to contain ultramafic rock[11]. As a result, risk of exposure to asbestos during the construction process would be considered less than significant.

Fugitive Dust

Construction of the Project would include ground-disturbing activities which could result in increased emissions of airborne particulate matter. The Project would be required to comply with SJVAPCD Regulation VIII (Fugitive PM_{10} Prohibitions). Mandatory compliance with SJVAPCD Regulation VIII would reduce emissions of fugitive dust from the Project site.

Construction of the Project is not anticipated to result in a substantial increase in particulate matter. As indicated in **Table 3-5** and **Table 3-6**, respectively, construction of the Project would generate maximum unmitigated annual emissions of approximately 0.9800 tons/year of PM_{10}, while operation of the Project is not anticipated to generate any PM_{10}, both of which are substantially less than SJVAPCD's threshold of significance of 15 tons/year. Project-related impacts to sensitive receptors would be less than significant.

III-d) Would the project result in other emissions (such as those leading to odors adversely affecting a substantial number of people?

d) Less Than Significant Impact. Implementation of the Project would not result in long-term emissions of odors. However, construction would involve the use of a variety of gasoline- or diesel-powered equipment that would emit exhaust fumes. Exhaust fumes, particularly diesel exhaust, may be considered objectionable by some people. The Project is located within an area dominated by agricultural production and dairies, which includes the use of diesel-powered equipment, various odorous chemicals, and the odors associated with the caretaking of herds cows on a regular basis. Construction activities would be short-term in nature. Conditions

[10] CARB. Inhalable Particulate Matter. https://www.arb.ca.gov/research/aaqs/common-pollutants/pm/pm.htm Accessed April 1, 2019.

[11] Van Gosen, B.S. and J.P. Clinkenbeard. 2011. Report Historic Asbestos Mines, Historic Asbestos Prospects, and Other Natural Occurrences of Asbestos in California – California Geological Survey map Sheet 59. United States Geological Survey.

created by Project-related activities would not vary substantially from the baseline conditions routinely experienced onsite and in the vicinity. Any impacts would be less than significant.

3.4 Biological Resources

Table 3-7. Biological Resources Impacts

Biological Resources				
Would the project:	**Potentially Significant Impact**	**Less than Significant With Mitigation Incorporated**	**Less than Significant Impact**	**No Impact**
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☐	☐	☒
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

3.4.1 Environmental Setting

The Project site is located in Tulare County within the lower San Joaquin Valley, part of the Great Valley of California. The Valley is bordered by the Sierra Nevada Mountain Ranges to the east, the Coast Ranges to the west, the Klamath Mountains and Cascade Range to the north, and the Transverse Ranges and Mojave Desert to the south.

Like most of California, the San Joaquin Valley experiences a Mediterranean climate. Warm, dry summers are followed by cool, moist winters. Summer temperatures often reach above 90 degrees Fahrenheit, and the humidity is generally low. Winter temperatures are often below 60 degrees Fahrenheit during the day and rarely exceed 70 degrees. On average, the Central Valley receives approximately 12 inches of precipitation in the form of rainfall yearly, most of which occurs between October and March.

The Deer Creek check structure is located along Deer Creek, just west of State Route 99, within the Town of Ducor-Deer Creek watershed; Hydrologic Unit Code (HUC): 180300050902. The proposed alignment for the Lateral 4 surface water delivery system lies approximately 6 miles north, within the Old Deer Creek Channel-Deer Creek watershed; HUC: 180300050904 and potentially extends westward into the Lamberson Ditch-Frontal Tulare Lake Bed watershed; HUC: 180300122102, if the District constructs the terminus basin at Road 76[12].

The Project lies entirely within the Tule Groundwater Subbasin of the San Joaquin Valley Groundwater Basin[13]. Principal drainages in the vicinity are Deer Creek, which intersects the Deer Creek check structure, and is located approximately 6 miles south of the proposed Lateral 4 alignment; and the Tule River, approximately 6.5 miles north of the proposed Lateral 4 alignment. Water features along the alignment consist of various man-made canals, irrigation ditches, basins, and dairy lagoons.

The Project is located in Tulare County, west of State Route 99 in an area dominated by agricultural production and dairy industry. Project areas are predominantly surrounded by agricultural lands, fallow fields, ruderal compacted dirt access roads, weedy ruderal lots, various excavated canals, basins, dairy lagoons and associated infrastructure, and scattered rural residences.

3.4.1.1 Deer Creek Project Area

The Deer Creek check structure is located over Deer Creek, just west of the Union Pacific Railroad and State Route 99, as illustrated in the Biological Evaluation Report (**Appendix B**). The channel of Deer Creek consists of riverine habitat and a corridor of valley foothill riparian habitat is present immediately along each bank. Riparian vegetation extends out to the barren compacted dirt road at top of bank on each side. Fallow field is present beyond the dirt road on the north side of the creek, and a productive orchard is present beyond the dirt road on the south side. All portions of the Deer Creek project area appear to be highly disturbed by human activities, and most of the vegetation observed was weedy and invasive. Large chunks of rip-rap line the banks east of the check structure. Scattered refuse and piles of debris are present along top of bank and throughout surveyed areas.

3.4.1.2 Lateral 4 Alignment

The proposed Lateral 4 canal alignment lies approximately 5.5 miles north of the Deer Creek check structure. The alignment would begin at the existing West Main canal, and run north for one mile before traveling west for approximately 4 or 5 miles, depending on which alternative is used. The first stretch of the alignment that travels north-south would intersect two dairy-forage fields (a distance of approximately 0.5 miles) and 0.5 miles of barren compacted dirt road. As the alignment changes direction and travels west, it intersects one fallow field (a distance of approximately 0.5 miles) and the remainder of the alignment would be constructed within barren compacted dirt road. If the Road 84 basin is constructed, impacts would also include a portion of a dairy-forage field. If the alternative basin location is chosen, additional impacts would include an existing basin with planted dairy-forage crops. Habitats and uses of the Project area and surrounding lands are illustrated in the Biological Evaluation Report (**Appendix B**).

3.4.2 Methodology

A reconnaissance-level field survey of the Project sites and surrounding areas was conducted on March 15, 2019 by Provost & Pritchard biologist, Brooke Fletcher. The surveys consisted of walking through the Project areas while identifying and noting land uses, biological habitats and communities, and plant and animal species encountered. Furthermore, the site and surrounding areas were assessed for suitable habitats

[12] EPA Waters GeoViewer. https://www.epa.gov/waterdata/waters-geoviewer Accessed 19 April 2019.
[13] DWR. Groundwater Basin Boundary Assessment Tool. https://gis.water.ca.gov/app/bbat/ Accessed 19 April 2019.

of various wildlife species. The biological evaluation report is available in its entirety as **Appendix B** at the end of this document.

Mrs. Fletcher conducted an analysis of potential Project-related impacts to biological resources based on the resources known to exist or with potential to exist within the Project site and surrounding areas. Sources of information used in preparation of this analysis included: the California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB); the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) system; the California Native Plant Society (CNPS) Online Inventory of Rare and Endangered Vascular Plants of California; CalFlora's online database of California native plants; the Jepson Herbarium online database (Jepson eFlora); U.S. Fish and Wildlife Service (USFWS) Environmental Conservation Online System (ECOS); the NatureServe Explorer online database; the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Plants Database; the California Department of Fish and Wildlife (CDFW) California Wildlife Habitat Relationships (CWHR) database; the California Herps online database; and various manuals, reports, and references related to plants and animals of the San Joaquin Valley region.

A thorough search of the CNDDB for published accounts of special status plant and animal species was conducted for the four 7.5-minute quadrangles containing the Project areas: *Taylor Weir, Tipton, Alpaugh,* and *Pixley,* and for all 12 of the neighboring quadrangles: *Allensworth, Delano West, Delano East, Sausalito School, Hacienda Ranch, Woodville, Hacienda Ranch NE, Corcoran, Waukena, Paige, Tulare,* and *Cairns Corner*. An official species list was obtained using the USFWS IPaC system for federally listed species with potential to be affected by the Project. These species, and their potential to occur within the Project area are listed in **Table 3-8** and **Table 3-9** on the following pages. A complete list of references is available in the biological evaluation report, which is included as **Appendix B** at the end of this document.

Table 3-8. List of Special Status Animals with Potential to Occur Onsite and/or in the Vicinity

Species	Status	Habitat	Occurrence on Project Site
American badger (*Taxidea taxus*)	CSC	Grasslands, savannas, and mountain meadows near timberline are preferred. Most abundant in drier open spaces of shrub and grassland. Burrows in soil.	**Possible.** This species reportedly inhabits the undisturbed grassland habitats of the Pixley National Wildlife Refuge, which is located approximately 3.5 miles west of the Deer Creek check structure. According to CNDDB, in 2016 an American badger individual was found dead on Highway 43 in an area surrounded by agricultural uses, south of the Pixley National Wildlife Refuge and near Colonel Allensworth State Historic Park, approximately 7 miles southwest of the Deer Creek check structure. Deer creek runs along the southern border of the Pixley National Wildlife Refuge, and special status mammals, such as the American badger, could use the intermittent creek as a movement corridor. Surveyed Project areas contained a vast ground squirrel population and an abundance of burrows. Frequent human disturbance would likely discourage habitation of this elusive mammal, especially when superior habitat is present within Pixley National Wildlife Refuge in the vicinity. However, this species is highly mobile, and an American badger individual could pass through Project areas during dispersal or mating movements.
Bakersfield legless lizard (*Anniella grinnelli*)	CSC	Found primarily underground, burrowing in loose, sandy soil. Forages in loose soil and leaf litter during the day. Occasionally observed on the surface at dusk and night. Prefers soil with a high moisture content.	**Possible.** Four Bakersfield legless lizard individuals were collected in 2016 and 2017 along Deer Creek, adjacent to Pixley National Wildlife Refuge, approximately 3 miles west of the Deer Creek check structure. Although this species was thought to only occur in Kern County, the CNDDB observations from 2016 and 2017 in the vicinity of the Project were made by *Anniella* expert, Theodore Papenfuss and should therefore be considered credible. Project areas frequently disturbed by agricultural production may be unsuitable for this species, but suitable habitat is present along the riparian corridor of Deer Creek and beneath piles of debris throughout Project areas.

Species	Status	Habitat	Occurrence on Project Site
blunt-nosed leopard lizard (*Gambelia sila*)	FE, CE, CFP	Inhabits semi-arid grasslands, alkali flats, low foothills, canyon floors, large washes, and arroyos, usually on sandy, gravelly, or loamy substrate, sometimes on hardpan. Often found where there are abundant rodent burrows in dense vegetation or tall grass. Cannot survive on lands under cultivation. Known to bask on kangaroo rat mounds and often seeks shelter at the base of shrubs, in small mammal burrows, or in rock piles. Adults may excavate shallow burrows but rely on deeper pre-existing rodent burrows for hibernation and reproduction.	**Possible.** This species is known to occur within Pixley National Wildlife Refuge and Allensworth Ecological Reserve and in the vicinity of the Project. However, all of the proposed impact areas along the proposed alignment for the Lateral 4 Canal are frequently disturbed by cultivation and activities related to agricultural production, and therefore unsuitable for this species. However, this species could pass through Project areas, especially along Deer Creek or in adjacent areas less frequently disturbed. Small mammal burrows are abundant throughout.
burrowing owl (*Athene cunicularia*)	CSC	Resides in open, dry annual or perennial grasslands, deserts, and scrublands with low growing vegetation. Nests underground in existing burrows created by burrowing mammals, most often ground squirrels.	**Present.** Several burrowing owl individuals were observed during the biological reconnaissance survey.
California red-legged frog (*Rana draytonii*)	FT	Inhabits perennial rivers, creeks, and stock ponds with vegetative cover within the Coast Range and northern Sierra foothills.	**Absent.** The Project area does not provide suitable habitat for this species and is outside of its current known range.
coast horned lizard (*Phrynosoma blainvillii*)	CSC	Found in grasslands, coniferous forests, woodlands, and chaparral, primarily in open areas with patches of loose, sandy soil and low-lying vegetation in valleys, foothills, and semi-arid mountains. Frequently found near ant hills and along dirt roads in lowlands along sandy washes with scattered shrubs.	**Possible.** This species is known to occur within Pixley National Wildlife Refuge and Allensworth Ecological Reserve and in the vicinity of the Project. Although dirt roads are prevalent throughout Project areas, ant hills were not observed, and the highly disturbed habitats and densely vegetated habitats of the Project areas are generally unsuitable for this species.
conservancy fairy shrimp (*Branchinecta conservatio*)	FE	Endemic to the grasslands of the northern two-thirds of the Central Valley. Found in large, turbid pools.	**Unlikely.** Vernal pools are absent from the Project areas. While areas of seasonal and ephemeral pooling were observed adjacent to the proposed Lateral 4 canal alignment, these areas are subject to frequent disturbance associated with agricultural production and therefore generally unsuitable for this species. This species could potentially occur within ephemeral pools, such as those observed onsite, but the frequent disturbance and use of agricultural chemicals make Project areas unlikely to sustain a population of vernal pool branchiopods.

Species	Status	Habitat	Occurrence on Project Site
Delta smelt (*Hypomesus transpacificus*)	FT, CE	This pelagic and euryhaline species is Endemic to the Sacramento-San Joaquin River Delta, upstream through Contra Costa, Sacramento, San Joaquin, and Solano Counties.	**Absent.** Suitable perennial aquatic habitat for this species is absent from the Project area and surrounding lands. The Project is outside of the current distribution range of this species.
fulvous whistling-duck (*Dendrocygna bicolor*)	CSC	Found in freshwater wetlands, flooded rice fields, grasslands, and pasture. Nests are bowl-shaped, in floating or flooded emergent vegetation.	**Unlikely.** Although the Project is located within the historic range of this species, fulvous whistling-ducks are now an irregular and unlikely occurrence in Tulare County. The most recent observations of this species occurred in 2006 at Pixley National Wildlife Refuge and at "Dead Pig Ponds" in Tulare County (Shuford and Gardali, 2008). Typical suitable habitat (freshwater wetlands and flooded rice fields) are absent from Project areas. The Project is located outside of the current breeding and wintering range of this species.
giant gartersnake (*Thamnophis gigas*)	FT, CT	Occurs in marshes, sloughs, drainage canals, irrigation ditches, rice fields, and adjacent uplands. Prefers locations with emergent vegetation for cover and open areas for basking. This species uses small mammal burrows adjacent to aquatic habitats for hibernation in the winter and to escape from excessive heat in the summer.	**Absent.** Habitats required by this species are absent from the Project area and surrounding lands. The Project is outside of the current distribution range of this species.
Kern Brook Lamprey (*Entosphenus hubbsi*)	CSC	Silty backwaters of large rivers in the foothill's region. Requires slight flow and shallow pools with sand, gravel, rubble, and mud substrate in areas where summer temperatures rarely exceed 77 degrees Fahrenheit.	**Absent.** Habitats required by this species are absent from the Project area and surrounding lands. The Project is outside of the current distribution range of this species.
mountain plover (*Charadrius montanus*)	CSC	Breeds on open plains at moderate elevations. Winters in short-grass plains and fields, plowed or fallow fields, and sandy deserts. Prefers flat, bare ground with burrowing rodents.	**Possible.** The Project is located within the current winter range of this species in the Central Valley (generally south of Sacramento and west of State Route 99). The most recent observation of this species was a flock of 645 plovers in the winter of 2005, just south of Allensworth (Shuford and Gardali, 2008), which is approximately 7 miles southwest of the Project. It is unlikely that nesting mountain plovers will be encountered, but a wintering flock could potentially occur within a fallow field in the vicinity of the Project.

Species	Status	Habitat	Occurrence on Project Site
Nelson's antelope squirrel (*Ammospermophilus nelsoni*)	CT	Found in the western San Joaquin Valley on dry, sparsely vegetated loamy soils. Relies heavily on existing small mammal burrows.	**Unlikely.** This species was observed in 1991 at Colonel Allensworth State Historic Park, approximately 7 miles southwest of Project. Although the Project is located within its historic range, this species has been nearly eliminated from the floor of the Tulare Basin. The habitats of the Project areas are frequently disturbed by agricultural practices, which likely also involve the use of rodenticides. This species often coexists with the giant kangaroo rat and inhabits abandoned burrow precincts. The Project area is outside of the known distribution range of the giant kangaroo rat and burrow precincts indicative of kangaroo rats were not observed during the biological survey. Furthermore, ground squirrel individuals and burrows were abundant throughout most of the surveyed areas. California ground squirrels have a propensity to inhabit disturbed lands and displace smaller fossorial species, such as the giant kangaroo rat and antelope squirrel. Harris and Stearns (1991) concluded that "on small habitat fragments surrounded by disturbed or agricultural lands, the potential for California ground squirrels to have a negative impact on antelope squirrels may be significant."
San Joaquin coachwhip (*Masticophis flagellum ruddocki*)	CSC	Found in open dry habitats with little or no tree cover in valley grassland and saltbush scrub communities in the San Joaquin Valley. Relies on mammal burrows for refuge and oviposition sites.	**Unlikely.** This species was observed in 1992 within uncultivated alkali sink scrub in Allensworth Ecological Reserve, approximately 7 miles southwest of the Project area. Small mammal burrows are abundant throughout the site. According to californiaherps.com (2019), this species is thought to be sensitive to disturbance and does not persist in cultivated areas. Therefore, the Project areas, which are frequently disturbed by intensive agricultural practices, are generally unsuitable for this species.

Species	Status	Habitat	Occurrence on Project Site
San Joaquin kit fox (*Vulpes macrotis mutica*)	FE, CT	Underground dens with multiple entrances in alkali sink, valley grassland, and woodland in valleys and adjacent foothills.	**Possible.** There are several recorded observations of this species in the vicinity of the Project, especially within Pixley National Wildlife Refuge and Allensworth Ecological Reserve. Deer creek runs along the southern border of the Pixley National Wildlife Refuge, and special status mammals, such as the San Joaquin kit fox, could use the intermittent creek as a movement corridor. Surveyed Project areas contained a vast ground squirrel population and an abundance of burrows, many large enough to provide refugia for kit fox. Frequent human disturbance would likely discourage habitation within Project areas, especially when superior habitat is present within Pixley National Wildlife Refuge in the vicinity. However, this species is highly mobile, and a kit fox individual could pass through Project areas during dispersal or mating movements.
Swainson's hawk (*Buteo swainsoni*)	CT	Nests in large trees in open areas adjacent to grasslands, grain or alfalfa fields, or livestock pastures suitable for supporting rodent populations.	**Likely.** Swainson's hawks are not uncommon in this portion of the Central Valley. There are several recorded observations of nesting Swainson's hawks, especially along Deer Creek in Pixley National Wildlife Refuge, which is located approximately 3.5 miles west of the Deer Creek check structure. Nesting habitat is present in the Cottonwoods along Deer Creek adjacent to the check structure and in a grove of walnut trees adjacent to the proposed Lateral 4 canal alignment. Foraging habitat is present throughout all surveyed Project areas in the form of agricultural and fallow fields.

Species	Status	Habitat	Occurrence on Project Site
Tipton kangaroo rat *(Dipodomys nitratoides nitratoides*)	FE, CE	Burrows in soil. Often found in grassland and shrubland.	**Unlikely.** There are several recorded observations of this species in the vicinity of the Project, especially within Pixley National Wildlife Refuge, which is located approximately 3.5 miles west of the Project, and Allensworth Ecological Reserve, which is located approximately 7 miles southwest of the Project. However, recent follow-up studies have found few, if any Tipton kangaroo rat individuals occurred at either of these sites, until 2007 when 144 individuals were translocated to Allensworth Ecological Reserve (USFWS, 2010). Surveyed Project areas contained a vast ground squirrel population and an abundance of burrows, although no burrow precincts indicative of kangaroo rats was observed. The disturbed habitats of the Project areas are generally unsuitable for this species.
tricolored blackbird (*Agelaius tricolor*)	CCE, CSC	Nests colonially near fresh water in dense cattails or tules, or in thickets of riparian shrubs. Forages in grassland and cropland. Large colonies are often found on dairy farm forage fields.	**Likely.** Suitable nesting and foraging habitat is present in the form of dairy-forage fields along the proposed Lateral 4 canal alignment. Several colonies of tricolored blackbird have been observed and monitored in the vicinity of the Project (Colibri, 2017 and 2018). Several of these colonies demonstrate site fidelity and return to the same fields yearly. Suitable nesting and foraging habitat in the form of dairy-forage fields was abundant along the proposed Lateral 4 canal alignment. Colonies of red-winged blackbirds were observed during the biological survey.
Tulare grasshopper mouse (*Onychomys torridus tularensis*)	CSC	Typically inhabit arid shrubland communities in hot, arid grassland and shrubland associations. Diet consists almost exclusively of arthropods.	**Absent.** There have been no recorded observations of this species in the last 50 years in the vicinity of the Project, which includes a 16-quad search of the CNDDB. Although the Project is located within the historic range of this species, the Tulare grasshopper mouse is thought have been extirpated in Tulare county and the rest of the Valley floor. Intensive trapping efforts in Pixley National Wildlife Refuge and other parts of Tulare County failed to result in the capture of any Tulare grasshopper mouse individuals.

Species	Status	Habitat	Occurrence on Project Site
vernal pool fairy shrimp (*Branchinecta lynchi*)	FT	Occupies vernal pools, clear to tea-colored water, in grass or mud-bottomed swales, and basalt depression pools.	**Unlikely.** Vernal pools are absent from the Project areas. While areas of seasonal and ephemeral pooling were observed adjacent to the proposed Lateral 4 canal alignment, these areas are subject to frequent disturbance associated with agricultural production and therefore generally unsuitable for this species. This species could potentially occur within ephemeral pools, such as those observed onsite, but the frequent disturbance and use of agricultural chemicals make Project areas unlikely to sustain a population of vernal pool branchiopods.
western snowy plover (*Charadrius alexandrinus nivosus*)	FT, CSC	Typically found on sandy beaches, salt pond levees, and shores of large alkali lakes.	**Possible.** The Project is located within the historic and current breeding range of this species. Although there have been no recorded observations of this species in the past 25 years in the vicinity of the Project, the dairy lagoons and excavated basins onsite provide suitable nesting habitat.
western spadefoot (*Spea hammondii*)	CSC	Prefers open areas with sandy or gravelly soils, in a variety of habitats including mixed woodlands, grasslands, coastal sage scrub, chaparral, sandy washes, lowlands, river floodplains, alluvial fans, playas, alkali flats, foothills, and mountains. Vernal pools or temporary wetlands, lasting a minimum of three weeks, which do not contain bullfrogs, fish, or crayfish are necessary for breeding.	**Possible.** The disturbed habitats of the Project areas are generally unsuitable for this species. However, seasonal and ephemeral pools were observed during the biological survey which could serve as marginal breeding habitat, and the site contained an abundance of rodent burrows which could serve as aestivation habitat. There have been several recorded observations of this species in the vicinity of the Project, including one within 2 miles of the Deer Creek check structure.

Table 3-9. List of Special Status Plants with Potential to Occur Onsite and/or in the Vicinity

Species	Status	Habitat	Occurrence on Project Site
Alkali mariposa-lily (*Calochortus striatus*)	CNPS 1B	Found in the Sierra Nevada foothills, desert mountains, and Mojave Desert in alkaline meadows and ephemeral washes within chaparral, chenopod scrub, Mojavean desert scrub, meadows and seep communities. There is some confusion about the accepted elevation range for this species, but it has been cited as low as 70 meters (230 feet) and as high as 1600 meters (5250 feet). Blooms April – June.	**Absent.** The disturbed habitats of the Project area are unsuitable for this species. The Project is near or outside of the elevational range for this species. The only record of this species within Tulare County includes one plant observed in undisturbed valley sink scrub habitat of Allensworth Ecological Reserve, approximately 7 miles southwest of the Deer Creek check structure, 22 years ago.
brittlescale (*Atriplex depressa*)	CNPS 1B	Found in the San Joaquin Valley and Sacramento Valley in alkali or clay soils in shadescale scrub, valley grassland, alkali sink, and riparian communities at elevations below 1050 feet. Equally likely to occur in wetlands and non-wetlands. Blooms June – October.	**Absent.** The disturbed habitats of the Project areas are unsuitable for this species. There have been no observations of this species in the vicinity of the Project in over 30 years.
California alkali grass (*Puccinellia simplex*)	CNPS 1B	Found in the San Joaquin Valley and other parts of California in saline flats and mineral springs within valley grassland and wetland-riparian communities at elevations below 3000 feet. Blooms March – May.	**Absent.** Suitable habitat required by this species is absent from the Project area and the disturbed nature of the Project areas make the sites further unsuitable. The nearest known occurrence of this species was recorded approximately 8 miles northwest of the Project area in 1983.
California jewelflower (*Caulanthus californicus*)	FE, CE, CNPS 1B	Found in the San Joaquin Valley and Western Traverse Ranges. Occurs on flats and slopes, generally in non-alkaline grassland at elevations between 230 feet and 3280 feet. Blooms February – April.	**Absent.** Suitable habitat required by this species is absent from the Project area. All of the recorded occurrences of this species in the vicinity of the Project have been updated to extirpated or possibly extirpated due to conversion of land to agriculture.
Coulter's goldfields (*Lasthenia glabrata ssp. coulteri*)	CNPS 1B	Found in salt marshes, playas, and vernal pools at elevations below 3200 feet. Blooms April – May.	**Absent.** Suitable habitat required by this species is absent from the Project area. The only record of this species in the vicinity includes an observation near Pixley National Wildlife Refuge, which is located approximately 3.5 miles west of the Deer Creek check structure, over 50 years ago.
Earlimart Orache	CNPS 1B	Found in the San Joaquin Valley in saline or alkaline soils	**Unlikely.** The disturbed habitats of the Project areas are unsuitable for this

Species	Status	Habitat	Occurrence on Project Site
(*Atriplex cordulata var. erecticaulis)*		at elevations below 325 feet. Equally likely to occur within wetlands and non-wetlands. Blooms August – September.	species. There are several observations of this species in the vicinity of the Project, but many of the populations are thought to have been extirpate due to conversion of land to agriculture.
Kern mallow (*Eremalche parryi ssp. kernensis*)	FE, CNPS 1B	Found on open, dry, sandy to clay soils, usually within valley saltbush scrub at elevations between 325 – 3300 feet. Blooms March – May.	**Absent.** The disturbed habitats of the Project areas are unsuitable for this species. The Project is near or outside of the elevational range for this species. There have been no observations of this species in the vicinity in over 30 years.
lesser saltscale (*Atriplex minuscula*)	CNPS 1B	Found in the San Joaquin Valley in playas; sandy, alkaline soils in shadescale scrub, valley grassland, and alkali sink communities at elevations below 300 feet. Blooms April – October.	**Unlikely.** Suitable habitat required by this species is absent from the Project area and the frequent disturbance associated with agricultural production is unsuitable for this species. The nearest known occurrence of this species was recorded at an unknown location west of Earlimart in 1993.
Lost Hills crownscale (*Atriplex coronata var. vallicola*)	CNPS 1B	Found in the San Joaquin Valley in chenopod scrub, valley and foothill grassland, and vernal pools at elevations below 1400 feet. Typically found in dried ponds on alkaline soils. Blooms April – September.	**Absent.** There have been two observations of this species in the vicinity of the Project, and both were within undisturbed powdery, alkaline soils in vernal pools within grasslands, and both observations were made more than 30 years ago. Habitats required by this species are absent from the Project areas.
recurved larkspur (*Delphinium recurvatum*)	CNPS 1B	Found in the San Joaquin Valley and other parts of California. Occurs in poorly drained, fine, alkaline soils in grassland at elevations between 100 feet and 1965 feet. Most often found in non-wetlands, but occasionally found in wetlands. Blooms March – June.	**Unlikely.** There is a historic (1938) observation of this species mapped near the Highway 99 bridge over Deer Creek, which is adjacent to the Deer Creek check structure. However, the disturbed nature of the Project area is generally unsuitable for his species. Furthermore, the conversion of native grassland to agricultural crops, and competition from invasive species has extirpated many populations of this species in the Central Valley. Known extant populations occur in undisturbed grasslands.
San Joaquin adobe sunburst (*Pseudobahia peirsonii*)	FT, CE, CNPS 1B	Found in the San Joaquin Valley and the Sierra Nevada Foothills in bare dark clay in valley grassland and foothill woodland communities at elevations between 325 feet and 2950 feet. Blooms March – May.	**Absent.** Habitats required by this species are absent from the Project area and surrounding lands. The Project site is near or outside of the elevational range for this species. The only record of this species in the vicinity is a historic collection (1897) at an unspecified location, which has since been updated to extirpated.
San Joaquin woollythreads (*Monolopia congdonii*)	FE, CNPS 1B	Occurs in the San Joaquin Valley in sandy soils in shadescale shrub and grasslands at elevations between 300 feet	**Absent.** Habitats required by this species are absent from the Project area and surrounding lands. The Project site is near or outside of the elevational range

Species	Status	Habitat	Occurrence on Project Site
		and 2300 feet. Found primarily in non-wetlands, but occasionally found in wetlands. Blooms February – May.	for this species. The only record of this species is from a historic collection (1881) at an unspecified location of "Deer Creek, Tulare County." According to CNPS, this species is thought to be extirpated from Tulare County.
slough thistle (*Cirsium crassicaule*)	CNPS 1B	Found in the San Joaquin Valley in freshwater sloughs, marshes, and riverbanks at elevations below 300 feet. Blooms March – June.	**Absent.** Disturbance and absence of preferred habitat makes the Project areas unsuitable for this species. The only observation of this species in the vicinity was recorded 48 years ago, approximately 20 miles southwest of the Project. The status of this observation has since been updated to possibly extirpated. According to CNPS, this species does not typically occur within Tulare County.
spiny-sepaled button-celery (*Eryngium spinosepalum*)	CNPS 1B	Found in the Sierra Nevada Foothills and portions of the San Joaquin Valley. Occurs in vernal pools, swales, and roadside ditches at elevations between 325 feet and 4160 feet in valley grassland, freshwater wetlands, and riparian communities. Blooms April – July.	**Absent**. Suitable habitat required by this species is absent from the Project area and surrounding lands. The Project site is near or outside of the elevational range for this species.
subtle orache (*Atriplex subtilis*)	CNPS 1B	Found in the San Joaquin Valley in saline depressions at elevations below 230 feet. Blooms June – October.	**Unlikely.** The disturbed habitats of the Project areas are unsuitable for this species. This species was not observed during the biological field survey. The nearest observation of this species was recorded in 1995, approximately 1 mile west of the Deer Creek check structure.
vernal pool smallscale (*Atriplex persistens*)	CNPS 1B	Occurs in San Joaquin Valley and Sacramento Valley in alkaline vernal pools at elevations below 375 feet. Usually found in wetlands, but occasionally found in non-wetlands. Blooms June – September.	**Absent.** Suitable habitat required by this species is absent from the Project area. The only reported occurrence of this species in the vicinity belongs to historic collection records dating from 1963 to 1985 from the Pixley Vernal Pool Preserve, approximately 6 miles northeast of the Project area.

EXPLANATION OF OCCURRENCE DESIGNATIONS AND STATUS CODES

Present:	Species observed on the site at time of field surveys or during recent past
Likely:	Species not observed on the site, but it may reasonably be expected to occur there on a regular basis
Possible:	Species not observed on the site, but it could occur there from time to time
Unlikely:	Species not observed on the site, and would not be expected to occur there except, perhaps, as a transient
Absent:	Species not observed on the site, and precluded from occurring there due to absence of suitable habitat

STATUS CODES

FE	Federally Endangered	CE	California Endangered
FT	Federally Threatened	CT	California Threatened
FPE	Federally Endangered (Proposed)	CCT	California Threatened (Candidate)
FPT	Federally Threatened (Proposed)	CFP	California Fully Protected
FC	Federal Candidate	CSC	California Species of Special Concern

CWL	California Watch List
CCE	California Endangered (Candidate)
CR	California Rare

CNPS LISTING

1A	Plants 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

3.4.3 Impact Assessment

IV-a) Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

a) Less Than Significant Impact with Mitigation Incorporated. California contains several "rare" plant and animal species. In this context, "rare" is defined as species known to have low populations or limited distributions. As the human population grows, resulting in urban expansion which encroaches on the already limited suitable habitat, these sensitive species become increasingly more vulnerable to extirpation. State and federal regulations have provided CDFW and U.S. Fish and Wildlife Service (USFWS) with a mechanism for conserving and protecting the diversity of plant and animal species native to California. Numerous native plants and animals have been formally designated as "threatened" or "endangered" under State and federal endangered species legislation. Other formal designations include "candidate" for listing or "species of special concern" by CDFW. The California Native Plant Society (CNPS) has its list of native plants considered rare, threatened, or endangered. Collectively these plants and animals are referred to as "special status species."

The biological evaluation (**Appendix B**) determined that the Project could potentially impact special status species and/or nesting birds which are protected by the federal Migratory Bird Treaty Act and the California Fish and Game Code. Special status and protected species that have the potential to be impacted by the Project are identified below with corresponding mitigation measures.

Implementation of the following mitigation measures will reduce potential impacts to special status plants and animals with potential to occur onsite to a less than significant level and will ensure compliance with State and federal regulations protecting these species.

General Mitigation Measures

Mitigation Measure BIO-1a (WEAP Training): Prior to initiating construction activities (including staging and mobilization), all personnel associated with Project construction shall attend mandatory Worker Environmental Awareness Program (WEAP) training, conducted by a qualified biologist, to aid workers in identifying special status resources that may occur in the Project area. The specifics of this program shall include identification of the sensitive species and suitable habitats, a description of the regulatory status and general ecological characteristics of sensitive resources, and review of the limits of construction and mitigation measures required to reduce impacts to biological resources within the work area. A fact sheet conveying this information, along with photographs or illustrations of sensitive species with potential to occur onsite, shall also be prepared for distribution to all contractors, their employees, and all other personnel involved with construction of the Project. All employees shall sign a form documenting that they have attended WEAP training and understand the information presented to them.

Mitigation Measure BIO-1b (Construction Operational Hours): Construction shall be conducted during daylight hours to reduce disturbance to wildlife that could be foraging within work areas.

Project-Related Mortality and/or Disturbance of Nesting Raptors, Migratory Birds, and Special Status Birds (Including Tricolored Blackbird and Swainson's Hawk)

Nesting bird season is generally accepted as February 1 through August 31; however, Swainson's hawk nesting season is generally accepted as March 1 through September 15. For simplicity, these timeframes have been combined.

Implementation of the following measures, will reduce potential impacts to nesting raptors, migratory birds, and most special status birds, including Swainson's hawk to a less than significant level, and will ensure compliance with State and federal laws protecting these avian species. These mitigation measures were derived and adapted from CDFW's *Staff Guidance Regarding Avoidance of Impacts to Tricolored Blackbird Breeding Colonies on Agricultural Fields* (2015), CDFW's *Staff Report Regarding Mitigation for Impacts to Swainson's Hawks (Buteo swainsoni) in the Central Valley of California* (1994), and the Swainson Hawk Technical Advisory Committee's *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (2000). Avian species requiring additional protective measures will be discussed in detail in the following sections.

Mitigation. The following measures will be implemented prior to the start of construction:

> ***Mitigation Measure BIO-2a (Avoidance):*** The Project's construction activities shall occur, if feasible, between September 16 and January 31 (outside of nesting bird season) in an effort to avoid impacts to nesting birds.
>
> ***Mitigation Measure BIO-2b (Pre-construction Survey):*** If activities must occur within nesting bird season (February 1 to September 15), a qualified biologist shall conduct pre-construction surveys for active nests and breeding colonies within 30 days prior to the start of construction. The survey shall include the proposed work area and surrounding lands within 0.5 mile. If no active nests or breeding colonies are observed, no further mitigation is required. Raptor nests are considered "active" upon the nest-building stage.
>
> ***Mitigation Measure BIO-2c (Establish Buffers):*** On discovery of any active nests or breeding colonies near work areas, the biologist shall determine appropriate construction setback distances based on applicable CDFW and/or USFWS guidelines and/or the biology of the species in question. Specifically, a 300-foot disturbance-free buffer shall be implemented around breeding colonies of tricolored blackbird, and a 0.5-mile disturbance-free buffer shall be implemented around active Swainson's hawk nests. Construction buffers shall be identified with flagging, fencing, or other easily visible means, and shall be maintained until the biologist has determined that the nestlings have fledged.

Project-Related Mortality and/or Disturbance of Burrowing Owl

At the time of the biological survey, several burrowing owls were observed flushing from burrows within and adjacent to Project areas. Implementation of the following measures, derived from the CDFW 2012 *Staff Report on Burrowing Owl Mitigation,* will reduce potential impacts to burrowing owls to a less than significant level, and will ensure compliance with State and federal laws protecting this species.

> ***Mitigation Measure BIO-3a (Pre-construction Take Avoidance Survey):*** A qualified biologist shall conduct a pre-construction take avoidance survey for burrowing owls and suitable burrows, in accordance with CDFW's *Staff Report on Burrowing Owl Mitigation* (2012), within 30 days prior to the start of construction activities. The survey shall include the proposed work area and surrounding lands within 500 feet. If no burrowing owl individuals or suitable burrows are observed, no further mitigation is required.

Mitigation Measure BIO-3b (Avoidance): If an active burrowing owl burrow is detected, the occurrence shall be reported to the local CDFW office and the CNDDB, and disturbance-free buffers shall be implemented in accordance with CDFW's 2012 *Staff Report on Burrowing Owl Mitigation,* as outlined in the table below:

Table 3-10. Burrowing Owl Buffer

Location	Time of Year	Level of Disturbance		
		Low	Medium	High
Nesting sites	April 1 – August 15	200 meters	500 meters	500 meters
Nesting sites	August 16 – October 15	200 meters	200 meters	500 meters
Nesting sites	October 16 – March 31	50 meters	100 meters	500 meters

Mitigation Measure BIO-3c (Consultation with CDFW and Passive Relocation): If avoidance of an active burrowing owl burrow is not feasible, CDFW shall be immediately consulted to determine the best course of action, which may include passive relocation during non-breeding season. Passive relocation and/or burrow exclusion shall not take place without coordination with CDFW and preparation of an approved exclusion and relocation plan.

Project-Related Mortality and/or Disturbance of Mountain Plover and Western Snowy Plover

Implementation of mitigation measures BIO-2a through BIO-2c will reduce potential impacts to mountain plovers and western snowy plovers to a less than significant level and will ensure compliance with State and federal laws protecting these avian species. No additional species-specific mitigation measures are required to provide adequate protection of special status plovers.

Project-Related Mortality and/or Disturbance of Burrowing Mammals (American Badger and San Joaquin Kit Fox)

General mitigation measure BIO-1a (WEAP Training) requires all construction personnel to attend a mandatory education program, which will include a detailed description of the San Joaquin kit fox and American badger and associated habitat requirements, color photographs or illustrations, an explanation of the conservation status of these species and coverage under State and federal regulations, penalties for violating said regulations, and a list of required measures to reduce impacts to these species during construction. General mitigation measure BIO-1b (Construction Operational Hours) limits construction activities to daylight hours which would reduce the likelihood of encountering a kit fox or American badger onsite.

Implementation of the following measures, derived from the USFWS 2011 *Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance,* will further reduce potential impacts to the San Joaquin kit fox and American badger to a less than significant level, and will ensure compliance with State and federal laws protecting these species.

Mitigation Measure BIO-4a (Pre-construction Burrow Survey): Within 30 days prior to the start of construction, a pre-construction survey for San Joaquin kit fox and American badger individuals and suitable burrows shall be conducted on and within 200 feet of proposed work areas. Any burrows within the survey area that are determined to be suitable for use by the San Joaquin kit fox or American badger shall be monitored for a period of three days using tracking medium and/or remotely triggered cameras. If an active kit fox or American badger den is detected within or adjacent to the Project area, construction will be delayed, and CDFW and USFWS shall be consulted to determine the best course of action.

Mitigation Measure BIO-4b (Minimization): The Project shall observe all minimization and protective measures from the Construction and On-Going Operational Requirements of the USFWS 2011 *Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground*

Disturbance, including, but not limited to: construction speed limits, covering of pipes, installation of escape structures, restriction of herbicide and rodenticide use, proper disposal of food items and trash, prohibition of pets and firearms, and completion of an employee education program.

Mitigation Measure BIO-4c (Mortality Reporting): The Sacramento Field Office of USFWS and the Fresno Field Office of CDFW will be notified in writing within three working days in the case of the accidental death or injury to a San Joaquin kit fox or American badger during construction. Notification must include the date, time, and location of the incident and any other pertinent information.

Project-Related Mortality and/or Disturbance of Special Status Reptiles (Blunt-nosed Leopard Lizard, Bakersfield Legless Lizard, Coast Horned Lizard, and Western Spadefoot)

Implementation of the following measure will reduce potential impacts to special status reptiles and amphibians to a less than significant level, and will ensure compliance with State and federal laws protecting these species.

Mitigation. The following measure will be implemented prior to the start of construction:

Mitigation Measure BIO-5 (Pre-construction Survey): A qualified biologist will perform a pre-construction survey for special status reptiles and amphibians with potential to occur onsite (blunt-nosed leopard lizard, Bakersfield legless lizard, coast horned lizard, and western spadefoot) within 30 days prior to the start of construction. The survey will cover all Project areas, including ingress/egress routes, staging areas, and 500-foot radius. If no special status reptiles or amphibians are observed, construction may begin. If special status reptiles and/or amphibians are observed during the pre-construction survey, all construction activities shall be delayed, and CDFW shall be consulted to determine the best course of action.

Project-Related Impacts to Special Status Plant Species

16 special status plant species have been documented in the Project vicinity, including alkali mariposa-lily (*Calochortus striatus*), brittlescale (*Atriplex depressa*), California alkali grass (*Puccinellia simplex*), California jewelflower (*Caulanthus californicus*), Coulter's goldfields (*Lasthenia glabrate ssp. coulteri*), Earlimart orache (*Atriplex cordulata var. erecticaulis*), Kern mallow (*Eremalche parryi spp. kernensis*), lesser saltscale (*Atriplex miniscula*), Lost Hills crownscale (*Atriplex coronata var. vallicola*), recurved larkspur (*Delphinium recurvatum*), San Joaquin adobe sunburst (*Pseudobahia peirsonii*), San Joaquin woollythreads (*Monolopia congdonii*), slough thistle (*Cirsium crassicaule*), spiny-sepaled button-celery (*Eryngium spinosepalum*), subtle orache (*Atriplex subtilis*), and vernal pool smallscale (*Atriplex persistens*). As explained in **Table 3-9**, all of the aforementioned plant species are either absent from or unlikely to occur within the Project area due to past and ongoing disturbance and/or the absence of suitable habitat. Therefore, the implementation of the Project will have no effect on individual plants or regional populations of these special status plant species. Mitigation measures are not warranted.

Project-Related Impacts to Special Status Animal Species Absent From, or Unlikely to Occur on, the Project Site

Of the 22 regionally occurring special status animal species, 10 are considered absent from or unlikely to occur within the Project area due to past or ongoing disturbance and/or absence of suitable habitat. As explained in **Table 3-8**, the following species were deemed absent from the Project area: California red-legged frog *(Rana draytonii*), Delta smelt (*Hypomesus transpacificus*), giant gartersnake (*Thamnophis gigas*), Kern brook lamprey (*Entosphenus hubbsi*), Tulare grasshopper mouse (*Onchomys torridus tularensis*); and the following species were deemed unlikely to occur within the Project area: conservancy fairy shrimp (*Branchinecta conservation*), fulvous whistling-duck (*Dendrocygna bicolor*), Nelson's antelope squirrel (*Ammospermophilus nelsoni*), San Joaquin coachwhip (*Masticophis flagellum ruddocki*), and Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*). Therefore, implementation of the Project will have no impact on these 10 special status species through construction mortality, disturbance, or loss of habitat. Mitigation measures are not warranted.

As discussed in the biological evaluation report (**Appendix B**), implementation of mitigation measures BIO-1 through BIO-5 will reduce the Project's potential direct or indirect adverse effects on species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by CDFW or USFWS to a less than significant level.

IV-b) Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

b) No Impact. According to CNDDB, there are no recorded natural communities of special concern with potential to occur within the Project area or vicinity. Additionally, no natural communities of special concern were observed during the biological survey. As discussed in the biological evaluation (**Appendix B**), riparian habitat is present along the corridor of Deer Creek. However, the Project does not propose removal of trees, shrubs, or vegetation along the Deer Creek riparian corridor, and construction in that area would be confined to modifications of the existing check structure. Furthermore, work within the channel of Deer Creek would require a Notification of Lake or Streambed Alteration (LSA) be submitted to CDFW pursuant to Section 1601 and 1602 of the California Fish and Game Code. If CDFW determines that the activity may adversely affect fish and wildlife resources, a Lake or Streambed Alteration Agreement will be prepared. Such an agreement typically stipulates that certain measures will be implemented to protect the habitat values of the lake or drainage in question. Therefore, the Project will have no impact on riparian habitat or any other sensitive natural community.

IV-c) Would the project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

c) No Impact. Deer Creek could potentially be considered a water of the United States and therefore under the jurisdiction of the USACE and subject to applicable permit requirements. The only water features present along the proposed Lateral 4 canal alignment are man-made irrigation basins, ditches, and canals which are typically not regulated by USACE. In the event that Deer Creek or any of the other features onsite are determined to be federally protected wetlands, a Clean Water Act Section 404 permit from the USACE and/or a Clean Water Act Section 401 Water Quality Certification from the Regional Water Quality Control Board may be required. Such permits are typically issued on the condition that the applicant agrees to implement certain measures to protect the function and value of the wetland, resulting in no net loss. None of the water features in any of the Project areas are classified as wild and scenic rivers or traditionally navigable waters. Although some seasonally ponded areas were observed within agricultural lands adjacent to the proposed Lateral 4 alignment, no features of traditional wetlands were observed during the biological survey. Therefore, the Project will have no impact on State or federally protected wetlands.

IV-d) Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

d) Less than Significant. Project areas along Deer Creek could function marginally as a wildlife movement corridor. Construction activities may temporarily disrupt movement along this potential corridor; however, construction will be temporary, short-term in duration, and limited to daylight hours. After the construction phase of the Project is complete, potential movement corridors along Project areas will function normally. The remainder of the Project areas along the proposed Lateral 4 alignment do not contain any features that would be likely to function as wildlife movement corridors. Furthermore, the Project is located in a region often disturbed by intensive agricultural cultivation practices and human disturbance which would discourage dispersal and migration. Therefore, Project-related impacts to wildlife movement corridors would be considered less than significant.

IV-e) Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

IV-f) Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

e and f) No Impact. The Project does not involve the removal of any trees and the design appears to be consistent with the goals and policies of the Tulare County General Plan. There are no known habitat conservation plans in the vicinity. There will be no impact.

3.5 Cultural Resources

Table 3-11. Cultural Resources Impacts

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

3.5.1 Environmental Setting

At the time of the Class III Inventory/ Phase I survey, the study area consisted of active farm fields. Although this location currently may be characterized as a dry open valley bottom, historically it may have been swampy, lying roughly 12-mi east of the historical Tule Lake shoreline. Prior to changes resulting from the agricultural development of the area, Deer Creek was an effective divide between mesic environments to the north and more xeric environments to the south. Historical and recent land-use has thus changed the vegetation that was once present within and near the project area. Prior to development, oak groves and Tule marshlands would have dominated. However, it is likely that Riparian Woodlands were once found along local drainages, including along Deer Creek. Although the project area may have included the Valley Grassland community, depending upon drainage and seasonal storm systems, freshwater marshes may have also been present. According to a Caltrans geoarchaeological study that included the PIXID Lateral 4 Project area classified this location as having Very Low to Medium sensitivity for subsurface sites, with the majority of the Project area rated Very Low (**Appendix C**).

3.5.2 Impact Assessment

V-a) Would the project cause a substantial adverse change in the significance of a historical resource pursuant to in §15064.5?

V-b) Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?

a-b) Less than Significant Impact with Mitigation Incorporated.
An intensive Class III inventory/Phase I cultural resources survey was conducted for the Pixley Irrigation District (PIXID) Lateral 4 Project, near Pixley, Tulare County, California. This study was conducted by ASM Affiliates, Inc., with David S. Whitley, Ph.D., RPA, serving as principal investigator. Background studies and fieldwork for the survey were completed in April – May 2019. The study was undertaken to provide compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (16 USC 470; 36 CFR Part 800), and the California Environmental Quality Act (CEQA). The project consists of the construction of approximately 6-linear miles of ditch, two tailwater basin alternatives totaling 20-acres, and a turn-out structure on Deer Creek.

In addition to the record search of the Sacred Lands File, NAHC provided a list of five local Native American Tribes who may have knowledge of cultural resources in the vicinity or general interest in the Project. The following five Tribes were contacted in writing via U.S. Mail with a letter dated May 1, 2019 informing them of the proposed Project.

1. *Kern Valley Indian Community, Lake Isabella, Robert Robinson, Chairperson*
2. *Santa Rosa Rancheria Tachi Yokut Tribe, Rueben Barrios, Sr., Chairperson*
3. *Tubatulabals of Kern County, Robert L. Gomez, Jr., Tribal Chairperson*
4. *Tule River Indian Tribe, Neil Pevron, Chairperson*
5. *Wuksache Indian Tribe, Eshom Valley Band, Kenneth Woodrow, Chairperson*

ASM Affiliates, Inc. further attempted to reach each Tribe by telephone or email correspondence on May 22, 2019. One response, by phone call, was received from Mr. Kenneth Woodrow, Chair of the Wuksache Indian Tribe – Eshom Valley Band. He expressed concern for potential buried cultural resources, based on his experience with the High-Speed Rail project. Mr. Woodrow was directed to the Caltrans geoarchaeological study which identifies the buried sensitivity of the Project APE. Follow-up phone calls were also made to other groups on the contact list. No other responses were received from any of the contacts, presumably indicating that there are no additional tribal concerns over the Project. A copy of Tribal correspondence can be found within the Historic Property Identification Report (**Appendix C**).

No archaeological resources were identified by the ASM Affiliates archaeologist during the field survey of the Project area in April, 2019. One cultural resource, a segment of Deer Creek including a check-structure proposed for retrofitting, was identified and documented during the survey. This resource is recommended as not NRHP/CRHR eligible.

Although it is unlikely that archeological resources will occur during construction or operation of the Proposed Project, CUL-1 is to be considered.

Mitigation Measure CUL-1 (Archaeological Resources)
In the event that archaeological resources are encountered at any time during development or ground-moving activities within the entire project area, all work in the vicinity of the find shall halt until a qualified archaeologist can assess the discovery. The District shall implement all recommendations of the archaeologist necessary to avoid or reduce to a less than significant level potential impacts to cultural resource. Appropriate actions could include a Data Recovery Plan or preservation in place.

V-c) Disturb any human remains, including those interred outside of dedicated cemeteries?

c) Less than Significant Impact with Mitigation Incorporated. No formal cemeteries or other places of human internment are known to exist on the Project site; however, in accordance with Health and Safety Code Section 7050.5 and Public Resource Code Section 5097.98, if human remains are uncovered, Mitigation Measure CUL-2 would be implemented.

Mitigation Measure CUL-2 (Human Remains)
If human remains are uncovered, or in any other case when human remains are discovered during construction, the Tulare County Coroner is to be notified to arrange proper treatment and disposition. If the remains are identified—on the basis of archaeological context, age, cultural associations, or biological traits—as those of a Native American, California Health and Safety Code 7050.5 and Public Resource Code 5097.98 require that the coroner notify the NAHC within 24 hours of discovery. The NAHC will then identify the Most Likely Descendent who will determine the manner in which the remains are treated.

3.6 Energy

Table 3-12. Energy Impacts

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

3.6.1 Environmental Setting

PG&E and Southern California Edison have sufficient energy supplies to serve the growth that has occurred in Tulare County. Much of the energy consumed in the region is for residential, commercial, and transportation purposes.

Construction equipment and construction worker vehicles operated during Project construction would use fossil fuels. This increased fuel consumption would be temporary and would cease at the end of the construction activity, and it would not have a residual permanent requirement for additional energy input. The marginal increases in fossil fuel use resulting from Project construction are not expected to have appreciable impacts on energy resources.

3.6.2 Impact Assessment

VI-a) Would the project result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

a) Less Than Significant Impact. As discussed in **Section 3.3**, the Project will not exceed any air emission thresholds during construction or operation. The Project will comply with construction best management practices and will be required to complete a SWPPP as part of construction and operational permits. Once completed, the Project will be mostly passive in nature and will not use an excessive amount of energy. The Project will not result in potentially significant environmental impacts due to wasteful, inefficient, or unnecessary consumption of energy resources during construction or operation. Any impacts would be less than significant.

VI-b) Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

b) No Impact. The Project will be almost entirely passive in nature once it is completed, and the construction phase will be temporary in nature and will not exceed any thresholds set by the SJVAPCD. Therefore, there would be no impact.

3.7 Geology and Soils

Table 3-13. Geology and Soils Impacts

Geology and Soils					
Would the project:		Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐
	ii) Strong seismic ground shaking?	☐	☐	☒	☐
	iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
	iv) Landslides?	☐	☐	☐	☒
b)	Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c)	Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d)	Be located on expansive soil, as defined in Table 18-1-B of the most recently adopted Uniform Building Code creating substantial direct or indirect risks to life or property?	☐	☐	☒	☐
e)	Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒
f)	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒

3.7.1 Environmental Setting

3.7.1.1 Geology and Soils

The Project is located in southern Tulare County, in the central section of California's Great Valley Geomorphic Province, or Central Valley. The Project site for the first phase consists of a portion of farmland for alternative one (Road 84 Basin), Avenue 116 alignment, and portions of farmland for lateral 4 and a vacant portion farmland for alternative two (Road 76 Basin). The site is relatively level with the exception of the gradual rise in elevation from West to East. The approximately elevation ranges from 235 feet amsl (Above Mean Sea Level) to 264 feet amsl. The second phase will consist of retrofitting the existing Deer Creek Check Structure located in Deer Creek. The approximate elevation is 269 amsl.

The Project area contains seven soil mapping units (**Table 3-14. Soils of the Project area**). A map of the soils on the site can be found in **Appendix B**.

Table 3-14. Soils of the Project area

Soils of the Project					
Soils Series	**Parent Material**	**Drainage Class**	**Hydric?**	**Shrink-swell Capacity**	**Project Acreage (Acres)**
Akers-Akers, saline-Sodic, complex, 0 to 2 percent slopes	Alluvium derived from granite rock sources	Well Drained	No	Flooding (1.00)	9.9
Biggriz-Biggriz, saline-Sodic, complex, 0 to 2 percent slopes	Alluvium derived from Granitic rock sources	Somewhat poorly drained	No	Flooding (1.00)/Shrink-swell(0.34)	12.1
Colpien loam, 0 to 2 percent slopes	Alluvium derived from Granite	Moderately well drained	No	Flooding (1.00)/Shrink-swell(0.50)	11.8
Gambogy loam, drained, 0 to 1 percent slopes	Alluvium derived from Granite	Poorly drained	No	Flooding (1.00)	27.2
Hanford sandy loam, 0 to 2 percent slopes	Alluvium derived from Granite	Well drained	No	Flooding (1.00)	0.6
Tagus loam, 0 to 2 percent slopes	Alluvium derived from Granite	Well drained	No	Flooding (1.00)	29.6
Riverwash	Alluvium derived from Granite	N/A	Yes	N/A	0.1

3.7.1.1 Faults and Seismicity

The Project site is not located within an Alquist-Priolo Earthquake Fault Zone and no known faults cut through the local soil at the site. The nearest major fault is the San Andreas Fault, Cholame-Carrizo section, located approximately 50 miles southwest of the Project site. The San Andreas Fault is the dominant active tectonic feature of the Coast Ranges and represents the boundary of the North American and Pacific plates. A smaller fault zone, the Poso Creek Fault is approximately 13 and 17 miles south of the Project. Tulare County is characterized as Severity Zone "Nil" and "Low" groundshaking with zero (no) declared landslides according to the updated report "State of California Multi-Hazard Mitigation Plan Chapter 6 - Other

Hazards. In most earthquakes, only weaker, masonry buildings would be damaged. However, very infrequent earthquakes could still cause strong shaking within Tulare County[14].

3.7.1.2 Liquefaction

The potential for liquefaction, which is the loss of soil strength due to seismic forces, is dependent on soil types and density, depth to groundwater, and the duration and intensity of ground shaking. Although no specific liquefaction hazard areas have been identified in Tulare County, this potential is recognized throughout the San Joaquin Valley where unconsolidated sediments and a high-water table coincide. It is reasonable to assume that due to the depth to groundwater within the southwestern portion of Tulare County, liquefaction hazards would be negligible. There is moderate risk of soil slumping and liquefaction when near the Tule River, however, the Project is not within the vicinity. Using the USDA NRCS soil survey of Tulare County, an analysis of the soils onsite was performed (**Appendix B**). See **Table 3-14. Soils of the Project area**.

3.7.1.3 Soil Subsidence

Subsidence occurs when a large land area settles due to over-saturation or extensive withdrawal of ground water, oil, or natural gas. These areas are typically composed of open-textured soils that become saturated. These areas are high in silt or clay content. The Project site is comprised of soils detailed in **Table 3-14. Soils of the Project area**. The soils' drainage classes range from "Poorly drained" to "Well drained". Furthermore, the soils classified as "Poorly drained" are approximately 30% of the total Project area. The majority of the Project area is considered "Moderately well drained" to "Well drained" with a low to moderate risk of subsidence (**Appendix B**).

3.7.1.4 Dam and Levee Failure

Lake Success is located approximately 22.5 miles east from the first phase and 22.6 miles northeast from the second phase. Additionally, and both phases of the Project lie approximately 3 miles west (first phase) and 5 miles southwest (second phase) from the inundation zone for Success Dam.

3.7.2 Impact Assessment

VII-a) Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

VI-a-i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

VI-a-ii) Strong seismic ground shaking?

a-i and a-ii) Less Than Significant Impact. The Project and its vicinity are located in an area traditionally characterized by relatively low seismic activity. The Project is not located in an Alquist-Priolo Earthquake Fault Zone as established by the Alquist-Priolo Fault Zoning Act (Section 2622 of Chapter 7.5, Division 2 of the California Public Resources Code). The nearest major fault to the first phase is the San Andreas Fault, Cholame-Carrizo section, located approximately 50 miles southwest of the first phase. A smaller fault zone, the Poso Creek Fault, is approximately 17 miles south of the phase. The nearest major fault to the second

[14] Tulare County General Plan, Health and Safety Element, Page 10-5 http://generalplan.co.tulare.ca.us/documents/GP/001Adopted%20Tulare%20County%20General%20Plan%20Materials/000General%20Plan%202030%20Part%20I%20and%20Part%20II/GENERAL%20PLAN%202012.pdf Accessed April 2, 2019

phase is the San Andreas Fault, Cholame-Carrizo section, located approximately 50 miles southwest of the second phase. A smaller fault zone, the Poso Creek Fault, is 13 miles southwest of the second phase.

The Project's intention is to diversify the water sources and improve groundwater recharge for Pixley Irrigation District. The Project does not include development of habitable residential, commercial, or industrial structures. Operation of the Project would not require permanent staff onsite or an increase in the number of employees required for routine maintenance. Instead, routine maintenance and repairs would be performed infrequently, on an as-needed basis by current Pixley Irrigation District employees. Therefore, implementation of the Project would not result in an increase of people or habitable structures onsite. Any impact would be less than significant.

VI-a-iii) Seismic-related ground failure, including liquefaction?

a-iii) Less Than Significant Impact. As discussed in **3.7.1.2**, liquefaction is a process which involves the temporary transformation of soil from a solid state to a fluid form during intense and prolonged groundshaking. Water-saturated areas with shallow depth to groundwater and uniform sands, loose-to-medium in density, are prone to liquefaction. Specific liquefaction hazard areas have not been identified in the County. The Project is not in a wetland area and is located in the southwestern portion of the County where liquefaction is considered a low to moderate risk. Any impact would be less than significant.

VI-a-iv) Landslides?

a-iv) No Impact. As the Project is located on the Valley floor, no major geologic landforms exist on or near the area that could result in a landslide event. According to the Tulare County General Plan, the Project site is characterized with a severity zone of "Nil" and "Low" groundshaking with no declared landslides[15] or not within or near a region classified with a high landslide potential. The Project is approximately 20 miles west of the Sierra Nevada foothills and the local topography is essentially flat and level. There will be no impact.

VII-b) Would the project result in substantial soil erosion or the loss of topsoil?

b) Less Than Significant Impact. Earthmoving activities associated with the Project would include excavation, grading, trenching, and infrastructure construction. These activities could expose soils to erosion processes and the extent of erosion would vary depending on slope steepness/stability, vegetation/cover, concentration of runoff, and weather conditions. Dischargers whose projects disturb one (1) or more acres of soil or whose projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity Construction General Permit Order 2009-0009-DWQ. Construction activity subject to this permit includes clearing, grading and disturbances to the ground such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The Construction General Permit requires the development of a Storm Water Pollution Prevention Plan (SWPPP) by a certified Qualified SWPPP Developer (QSD). Furthermore, The Project will utilize Best Management Practice's detailed in the California Storm Water Best Management Practice Handbook for Construction Activity.[16] Since the Project site has relatively flat terrain with a gradual west to east slope increase, there is a low potential for soil erosion and would comply with the SWRCB requirements, the impact would be less than significant.

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[15] Tulare County General Plan, Health and Safety Element, Page 10-5
http://generalplan.co.tulare.ca.us/documents/GP/001Adopted%20Tulare%20County%20General%20Plan%20Materials/000General%20Plan%202030%20Part%20I%20and%20Part%20II/GENERAL%20PLAN%202012.pdf Accessed April 2, 2019

[16] California Storm Water Best Management Practice Handbook for Construction Activity,
https://www.casqa.org/sites/default/files/BMPHandbooks/BMP_NewDevRedev_Complete.pdf , Accessed April 4, 2019

VII-c) Would the project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

VII -d) Would the project be located on expansive soil, as defined in Table 18-1-B of the most recently adopted Uniform Building Code creating substantial direct or indirect risks to life or property?

c and d) Less Than Significant Impact. Soils onsite consist are depicted on **Table 3-14**, which are classified from "Poorly drained" to "Well drained" all with a negligible or low runoff class (See **Appendix B**). The Project is proposing to construct a surface water transfer to system from the end of the existing West Main Canal, traveling along the alignment of Avenue 116, and terminate in one of the basin alternatives. The second phase is proposing to retrofit the Deer Creek Check Structure with automated gates. The Project's intention is to diversify the water sources available for Pixley Irrigation District. The Project and surrounding areas do not contain substantial grade changes. Risk of landslides, lateral spreading, subsidence, liquefaction, and collapse are minimal due to the soil characteristics. The Project does not propose a significant change in the local topography that would cause sloping. In addition, the Project does not include the development of structures or facilities that could be affected by expansive soils or expose people to substantial risks to life or property. Furthermore, the Project will be consistent with the California Building Standards Code. Any impacts would be less than significant.

VII-e) Would the project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

e) No Impact. Septic installation or alternative wastewater disposal systems are not necessary for the project. There will be no impact.

VI f) Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

f) No Impact. Paleontological resources are fossilized remains of flora and fauna and associate deposits. CEQA requires that a determination be made as to whether a project would directly or indirectly destroy a unique paleontological resource or site or unique geological feature (CEQA Appendix G(v)(c)). If an impact is significant, CEQA requires feasible measures to minimize the impact (CCR Title 14(3) Section 15126.4(a)(1)). PRC Section 5097.5 (see above) also applies to paleontological resources.

There are no unique paleontological resources or sites or unique geologic features present on the proposed Project site. Therefore, the Project would not directly or indirectly destroy any unique paleontological resources or sites or any unique geologic feature. There would be no impact.

3.8 Greenhouse Gas Emissions

Table 3-15. Greenhouse Gas Emissions Impacts

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

3.8.1 Environmental Setting

The Earth's climate has been warming for the past century. It is believed that this warming trend is related to the release of certain gases into the atmosphere. Greenhouse gases (GHG) absorb infrared energy that would otherwise escape from the Earth. As the infrared energy is absorbed, the air surrounding the Earth is heated. An overall warming trend has been recorded since the late 19th century, with the most rapid warming occurring over the past two decades. The 10 warmest years of the last century all occurred within the last 15 years. It appears that the decade of the 1990s was the warmest in human history (National Oceanic and Atmospheric Administration, 2010). Human activities have been attributed to an increase in the atmospheric abundance of greenhouse gases. The following is a brief description of the most commonly recognized GHGs.

3.8.1.1 Greenhouse Gases

Commonly identified GHG emissions and sources include the following:

Carbon dioxide (CO_2) is an odorless, colorless natural greenhouse gas. CO_2 is emitted from natural and anthropogenic sources. Natural sources include the following: decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic out gassing. Anthropogenic sources include the burning of coal, oil, natural gas, and wood.

Methane (CH_4) is a flammable greenhouse gas. A natural source of methane is the anaerobic decay of organic matter. Geological deposits, known as natural gas fields, also contain methane, which is extracted for fuel. Other sources are from landfills, fermentation of manure, and ruminants such as cattle.

Nitrous oxide (N_2O), also known as laughing gas, is a colorless greenhouse gas. Nitrous oxide is produced by microbial processes in soil and water, including those reactions that occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load.

Water vapor is the most abundant, and variable greenhouse gas. It is not considered a pollutant; in the atmosphere, it maintains a climate necessary for life.

Ozone (O_3) is known as a photochemical pollutant and is a greenhouse gas; however, unlike other greenhouse gases, ozone in the troposphere is relatively short-lived and, therefore, is not global in nature. Ozone is not emitted directly into the atmosphere but is formed by a complex series of chemical reactions between volatile organic compounds, nitrogen oxides, and sunlight.

Aerosols are suspensions of particulate matter in a gas emitted into the air through burning biomass (plant material) and fossil fuels. Aerosols can warm the atmosphere by absorbing and emitting heat and can cool the atmosphere by reflecting light.

Chlorofluorocarbons (CFCs) are nontoxic, nonflammable, insoluble, and chemically unreactive in the troposphere (the level of air at the earth's surface). CFCs were first synthesized in 1928 for use as refrigerants, aerosol propellants, and cleaning solvents. CFCs destroy stratospheric ozone; therefore, their production was stopped as required by the Montreal Protocol in 1987.

Hydrofluorocarbons (HFCs) are synthetic chemicals that are used as a substitute for CFCs. Of all the greenhouse gases, HFCs are one of three groups (the other two are perfluorocarbons and sulfur hexafluoride) with the highest global warming potential. HFCs are human made for applications such as air conditioners and refrigerants.

Perfluorocarbons (PFCs) have stable molecular structures and do not break down through the chemical processes in the lower atmosphere; therefore, PFCs have long atmospheric lifetimes, between 10,000 and 50,000 years. The two main sources of PFCs are primary aluminum production and semiconductor manufacture.

Sulfur hexafluoride (SF_6) is an inorganic, odorless, colorless, nontoxic, nonflammable gas. It has the highest global warming potential of any gas evaluated. Sulfur hexafluoride is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection.

3.8.1.2 Effects of Climate Change

There are uncertainties as to exactly what the climate changes will be in various local areas of the earth, and what the effects of clouds will be in determining the rate at which the mean temperature will increase. There are also uncertainties associated with the magnitude and timing of other consequences of a warmer planet: sea level rise, spread of certain diseases out of their usual geographic range, the effect on agricultural production, water supply, sustainability of ecosystems, increased strength and frequency of storms, extreme heat events, air pollution episodes, and the consequence of these effects on the economy.

Emissions of GHGs contributing to global climate change are largely attributable to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors. About three-quarters of human emissions of CO_2 to the global atmosphere during the past 20 years are due to fossil fuel burning. Atmospheric concentrations of CO_2, CH_4, and N_2O have increased 31 percent, 151 percent, and 17 percent respectively since the year 1750 (CEC 2008). GHG emissions are typically expressed in carbon dioxide-equivalents (CO_2e), based on the GHG's Global Warming Potential (GWP). The GWP is dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. For example, one ton of CH_4 has the same contribution to the greenhouse effect as approximately 21 tons of CO_2. Therefore, CH_4 is a much more potent GHG than CO_2.

3.8.2 Methodology

An Air Quality and Greenhouse Gas Emissions Evaluation Report (**Appendix A**) was prepared in April 2019. The sections below detail the methodology of the report and its conclusions.

3.8.2.1 Short-Term Construction-Generated Emissions

Short-term construction emissions associated with the Project were calculated using CalEEmod, Version 2016.3.2. Emissions' modeling was assumed to occur over an approximate nine-month period and covering a site area of 85.72 acres. Remaining assumptions were based on the default parameters contained in the model. Modeling assumptions and output files are included in **Appendix A**.

3.8.2.2 Long-Term Operational Emissions

Long-term operational emissions associated with the Project are estimated to be minimal in nature. Maintenance will be provided on an as needed basis by existing staff, and the operational equipment, such as the use of stationary electric pumps, will be similar to the existing system which results in negligible emissions. Modeling assumptions and output files are included in **Appendix A**.

3.8.2.3 Thresholds of Significance

CEQA Guidelines Amendments became effective March 18, 2010. Included in the Amendments are revisions to the Appendix G Initial Study Checklist. In accordance with these Amendments, a project would be considered to have a significant impact to climate change if it would:

a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or,
b. Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

In accordance with SJVAPCD's *CEQA Greenhouse Gas Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects*[17], proposed projects complying with Best Performance Standards (BPS) would be determined to have a less-than-significant impact. Projects not complying with BPS would be considered less than significant if operational GHG emissions would be reduced or mitigated by a minimum of 29 percent, in comparison to business-as-usual (year 2004) conditions. In addition, project-generated emissions complying with an approved plan or mitigation program would also be determined to have a less-than-significant impact.

3.8.3 Impact Assessment

VIII-a) Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? And

a) Less Than Significant Impact.

Short-Term Construction-Generated Emissions

Estimated construction-generated emissions are summarized in **Table 3-14**. As indicated, construction of the Project would generate maximum annual emissions of approximately 672.3340 metric tons of carbon dioxide equivalent ($MTCO_2e$). Construction-related production of GHGs would be temporary and last approximately two years and two months.

[17] Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA. http://www.valleyair.org/Programs/CCAP/12-17-09/3%20CCAP%20-%20FINAL%20LU%20Guidance%20-%20Dec%2017%202009.pdf Accessed April 10, 2019

Table 3-16. Short-Term Construction-Generated GHG Emissions

Short-Term Construction-Generated GHG Emissions	
Year	Emissions (MT CO_2e)(1)
2019	118.5594
2020	590.6318
2021	672.3340
*AB 32 Consistency Threshold for Land-Use Development Projects**	*1,100*
*AB 32 Consistency Threshold for Stationary Source Projects**	*10,000*
Exceed Threshold?	No

1. *Emissions were quantified using the CalEEmod, Version 2016.3.2. Refer to Appendix A for modeling results and assumptions. Totals may not sum due to rounding.*

* As published in the Bay Area Air Quality Management District's CEQA Air Quality Guidelines. Available online at http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en Accessed April 10, 2019.

Long-Term Operational Emissions

Estimated long-term operational emissions are summarized in **Table 3-17**. As indicated, operation of the Project would generate maximum annual emissions of approximately 1.6400 metric tons of carbon dioxide equivalent (MTCO_2*e*).

Table 3-17. Long-Term Operational GHG Emissions

Long-Term Operational GHG Emissions	
	Emissions (MT CO_2e)(1)
Estimated Total Annual Operational CO_2e Emissions	1.6400
*AB 32 Consistency Threshold for Land-Use Development Projects**	*1,100*
*AB 32 Consistency Threshold for Stationary Source Projects**	*10,000*
Exceed Threshold?	No

1. *Emissions were quantified using the CalEEmod, Version 2016.3.2. Refer to Appendix A for modeling results and assumptions. Totals may not sum due to rounding.*

* As published in the Bay Area Air Quality Management District's CEQA Air Quality Guidelines. Available online at http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en Accessed April 10, 2019.

Long-term operational emissions will consist of maintenance. Maintenance will continue to be provided on an as needed basis by existing PIXID staff. Furthermore, there is no population growth associated with the Project. Therefore, Project-related emissions of GHGs would be less than significant.

VIII-b) Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

b) Less Than Significant Impact. In accordance with SJVAPCD's recommended guidance, project-generated GHG emissions would be considered less than significant if: (1) the Project complies with applicable BPS; (2) operational GHG emissions would be reduced or mitigated by a minimum of 29 percent in comparison to business-as usual (year 2004) conditions; or (3) project-generated emissions would comply with an approved plan or mitigation program.

The SJVAPCD recognizes that the CARB's Cap-and-Trade regulation is an adopted State-wide plan for reducing or mitigating GHG emissions from targeted industries. In June of 2014, the SJVAPCD issued APR-2025[18]. In this policy document, the SJVAPCD concluded that the combustion of fossil fuels including fuels associated with on- and off-road vehicles, are subject to Cap-and-Trade requirements. The SJVAPCD further concluded that through implementation of the Cap-and-Trade regulation, project specific GHG emissions generated by fossil fuel use would be fully mitigated.

As noted above in **Table 3-16** and **Table 3-17**, Project-generated GHG emissions would be attributable to the consumption of fossil fuels associated with the operation of on- and off-road vehicles. As discussed above, the SJVAPCD has determined that project-generated GHG emissions associated with the use of fossil fuels would be fully mitigated through implementation of CARB's Cap-and-Trade regulation and, therefore, would be considered have a less than significant individual and cumulative impact on the environment.

As discussed earlier in this document, the Cap-and-Trade regulation is a key component in California's AB 32 GHG-reduction goals. On August 21, 2008, the SJVAPCD Governing Board approved the District's Climate Change Action Plan (CCAP). The CCAP includes various recommended measures for the reduction of GHG emissions associated with development projects. However, of the measures recommended, none are applicable to the proposed Project.

The Project complies with the Bay Area Air Quality Management District's GHG emissions thresholds for significance. For the aforementioned reasons, implementation of the Project is not anticipated to conflict with any applicable plan, policy or regulation for reducing the emissions of GHGs, nor will the proposed Project have a significant impact on the environment. The impact would be considered less than significant.

[18] APR 2025 https://www.valleyair.org/policies_per/Policies/APR-2025.pdf Accessed April 10, 2019

3.9 Hazards and Hazardous Materials

Table 3-18. Hazards and Hazardous Materials Impacts

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

3.9.1 Environmental Setting

3.9.1.1 Hazardous Materials

The Hazardous Waste and Substances Sites (Cortese) List is a planning document used by the State, local agencies, and developers to comply with CEQA requirements in providing information about the location of hazardous materials release sites. Government Code (GC) Section 65962.5 requires the California Environmental Protection Agency (CalEPA) to develop at least annually an updated Cortese List. The Department of Toxic Substances Control (DTSC) is responsible for a portion of the information contained in the Cortese List. Other State and local government agencies are required to provide additional hazardous material release information for the Cortese List. DTSC's EnviroStor database provides DTSC's component of Cortese List data (DTSC, 2010). In addition to the EnviroStor database, the State Water Resources Control Board (SWRCB) Geotracker database provides information on regulated hazardous waste facilities in California, including underground storage tank (UST) cases and non-UST cleanup programs, including Spills-Leaks-Investigations-Cleanups (SLIC) sites, Department of Defense (DOD) sites, and Land Disposal program. A search of the DTSC EnviroStor database and the SWRCB Geotracker performed on March 29, 2019 determined that there are no known active hazardous waste generators or hazardous material spill sites within the Project site or immediate surrounding vicinity. Hazardous wastes are handled according to State and Federal law and the County's Hazardous Water Management Plan.

3.9.1.2 Airports

The Fresno Yosemite International Airport is approximately 55.5 miles northwest, the Corcoran Municipal Airport is approximately 12.5 miles northwest, and a private airstrip is approximately 1.5 miles southeast of the first phase. The Fresno Yosemite International Airport is approximately 63.5 miles northwest, the Delano Municipal Airport is approximately 11 miles south, and a private airstrip is approximately 1.5 miles southeast of the second phase.

3.9.1.3 Emergency Response Plan

The Tulare County Office of Emergency Services (OES) is the County's emergency management agency, responsible for coordinating multi-agency responses to complex, large-scale emergencies and disasters occurring within the unincorporated area of the County.

3.9.1.4 Sensitive Receptors

Along the first phase there are four Single-Family residence within the phase's vicinity. The nearest Single-Family residence is approximately 100 feet south of the phase. For the second phase there is a Single-Family residence approximately 570 feet to the east of the phase.

3.9.2 Impact Assessment

IX-a) Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? and;

IX-b) Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

IX-c) Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

a-c) Less Than Significant Impact. Implementation of the Project would diversify water sources available and increase groundwater recharge for the Pixley Irrigation District in order to better serve the property owners within the District.

The Project will be required to implement a SWPPP and will comply with all Cal/OSHA regulations regarding regular maintenance and inspection of equipment, spill prevention, and spill remediation in order to reduce the potential for incidental release of pollutants or hazardous substances onsite. Construction of the Project may involve the use of hazardous materials associated with construction equipment, such as diesel fuel, hydraulic oil, grease, adhesives, paints, solvents, and other petroleum-based products. Any potential accidental hazardous materials spills during construction are the responsibility of the contractor to remediate in accordance with industry best management practices and State and county regulations. The total APE is approximately 86 acres. Any impacts related to hazardous spills or emissions will be less than significant.

IX-d) Would the project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

d) No Impact. The Project does not involve land that is listed as a hazardous materials site pursuant to Government Code Section 65962.5 and is not included on a list compiled by the Department of Toxic Substances Control. A search of the DTSC EnviroStor database and the SWRCB Geotracker performed on March 29, 2019 determined that there are no known active hazardous waste generators or hazardous material spill sites within the Project site or immediate surrounding vicinity. There will be no impact.

IX-e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?

e) Less Than Significant Impact. The Project is not located within an airport land use plan. There are two private airstrips: one located approximately 1.5 miles south of the first phase and one approximately 1.5 miles southeast of the second phase. Additionally, since the airstrips is considered private, this limits the amount of traffic and size of airplanes allowed to land on it. Furthermore, there are municipal airports located approximately 12.5 miles northwest of the first phase (Corcoran Municipal Airport) and approximately 11 miles south of the of the second phase (Delano Municipal Airport). Operation of the Project would not generate excessive noise, and any construction noise would be temporary. The impact will be less than significant.

IX-f) Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

f) No Impact. The Project includes the construction of an open channel (lateral 4), basin, and retrofitting the existing Deer Creek Check Structure. Construction traffic associated with the Project would be minimal and temporary, occurring intermittently over approximately two years and two months. Operational traffic will consist of as-needed maintenance trips and will have no effect on roadways or emergency access. No construction is proposed on public roads; therefore, road closures and detours are not anticipated as part of the construction phase of the Project. There will be no Project-related impacts to emergency evacuation routes or emergency response.

IX-g) Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

g) No Impact. The Project is not located in or near state responsibility areas or lands classified as very high fire hazard severity zones. The nearest State Responsibility Area is approximately 13 miles southeast of the Project. The Project does not include any residential components, nor would it require any employees to be stationed permanently at the site on a daily basis. There would be no impact.

3.10 Hydrology and Water Quality

Table 3-19. Hydrology and Water Quality Impacts

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

3.10.1 Environmental Setting

The Project is located in the southern part of Tulare County in the Central San Joaquin Valley, part of the Great Valley of California. In addition, the Project lies completely within Tule Groundwater Subbasin of the San Joaquin Valley Groundwater Basin.[19] The Valley is bordered by the Sierra Nevada Mountain Ranges to the east, the Coast Ranges to the west, the Klamath Mountains and Cascade Range to the north, and the Transverse Ranges and Mojave Desert to the south.

Like most of California, the San Joaquin Valley experiences a Mediterranean climate. Warm, dry summers are followed by cool, moist winters. Summer temperatures often reach above 90 degrees Fahrenheit, and the

[19] DWR Bulletin 118 Groundwater Basin Boundary Assessment Tool. https://gis.water.ca.gov/app/bbat/ Accessed April 10, 2019.

humidity is generally low. Winter temperatures are often below 60 degrees Fahrenheit during the day and rarely exceed 70 degrees. The Central Valley receives an average of 12 inches of precipitation in the form of rainfall yearly, most of which occurs between October and March. According to the U.S. Geological Survey (USGS) classification system, the Project is located within the Tulare-Buena Vista Lakes watershed; Hydrologic Unit Code (HUC): 18030012.[20] This watershed is broadly defined as "the drainage into the Tulare and Buena Vista Lake closed basins.[21]"

Water resources in Tulare County include many natural rivers and streams, man-made surface water conveyance structures, and groundwater. Tulare County's groundwater and surface water management is accomplished through various combinations of public and private water entities, including the Bureau of Reclamation, water utility companies, and local irrigation districts (Pixley Irrigation District), all of which are governed by State and federal regulations. West-flowing Tule River, Deer Creek, and the White River are the major drainages in the subbasin which empty into the Tulare lakebed. Deer Creek is approximately 5 miles south of the first phase and the second phase is located on Deer Creek.

3.10.2 Impact Assessment

X-a) Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

a) Less Than Significant Impact. The State Water Resources Control Board (SWRCB) requires that a Storm Water Pollution Prevention Plan (SWPPP) be prepared as a requirement of the (National Pollution Discharge Elimination System (NPDES) for projects that disturb one or more acres of soil. A SWPPP involves site planning and scheduling, limiting disturbed soil areas, and determining best management practices to minimize the risk of pollution and sediments being discharged from construction sites. Implementation of the SWPPP will minimize the potential for the Project to substantially alter the existing drainage pattern in a manner that will result in substantial erosion or siltation onsite or offsite.

The intent of the Project is to diversify the water resources available for the District. It will increase the supply of water available by implementing lateral 4 to connect to the West Main Canal and terminate into one of the two basin alternatives. Additionally, the Project will increase the amount of groundwater recharge into the local underlying aquifer with the water storage in the selected terminal basin. Historically, the District has been solely reliant on groundwater pumping. The Project will not generate any type of process or waste water. As such, there will be no discharge directly associated with Project implementation that could impact water quality standards of any nearby waters of the United States. The impacts will be less than significant.

X-b) Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project would impede sustainable groundwater management of the basin?

b) Less Than Significant Impact. Implementation of the Project will transfer approximately 5,300 acre-feet (AF) per year and the goal is to store approximately 90 AF of water within the selected terminal basin. There is no anticipated increase in water demand resulting from implementation of the Project. Furthermore, the Project will be compliant to principles set forth in the Tulare County General Plan. Such policies include: "Identify and encourage the development of new sources for water that do not deplete or negatively impact groundwater and identify and encourage the development of locations where water recharge systems can be developed to replenish water supplies".[22]

[20] USGS Watershed Maps. https://water.usgs.gov/maps.html Accessed April 10, 2019
[21] Ibid.
[22] Tulare County General Plan, Page C-3
http://generalplan.co.tulare.ca.us/documents/GP/001Adopted%20Tulare%20County%20General%20Plan%20Materials/000General%20Plan%202030%20Part%20I%20and%20Part%20II/GENERAL%20PLAN%202012.pdf Accessed April 10, 2019

Implementation of the Project will allow for some incidental groundwater recharge and will not impede sustainable groundwater management of the San Joaquin Valley Tule subbasin, nor will it substantially decrease ground water supplies. Any impacts will be less than significant.

X-c) Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

(i) result in substantial erosion or siltation on- or off-site;

(ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or offsite;

(iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainsage systems or provide substantial additional sources of polluted runoff; or

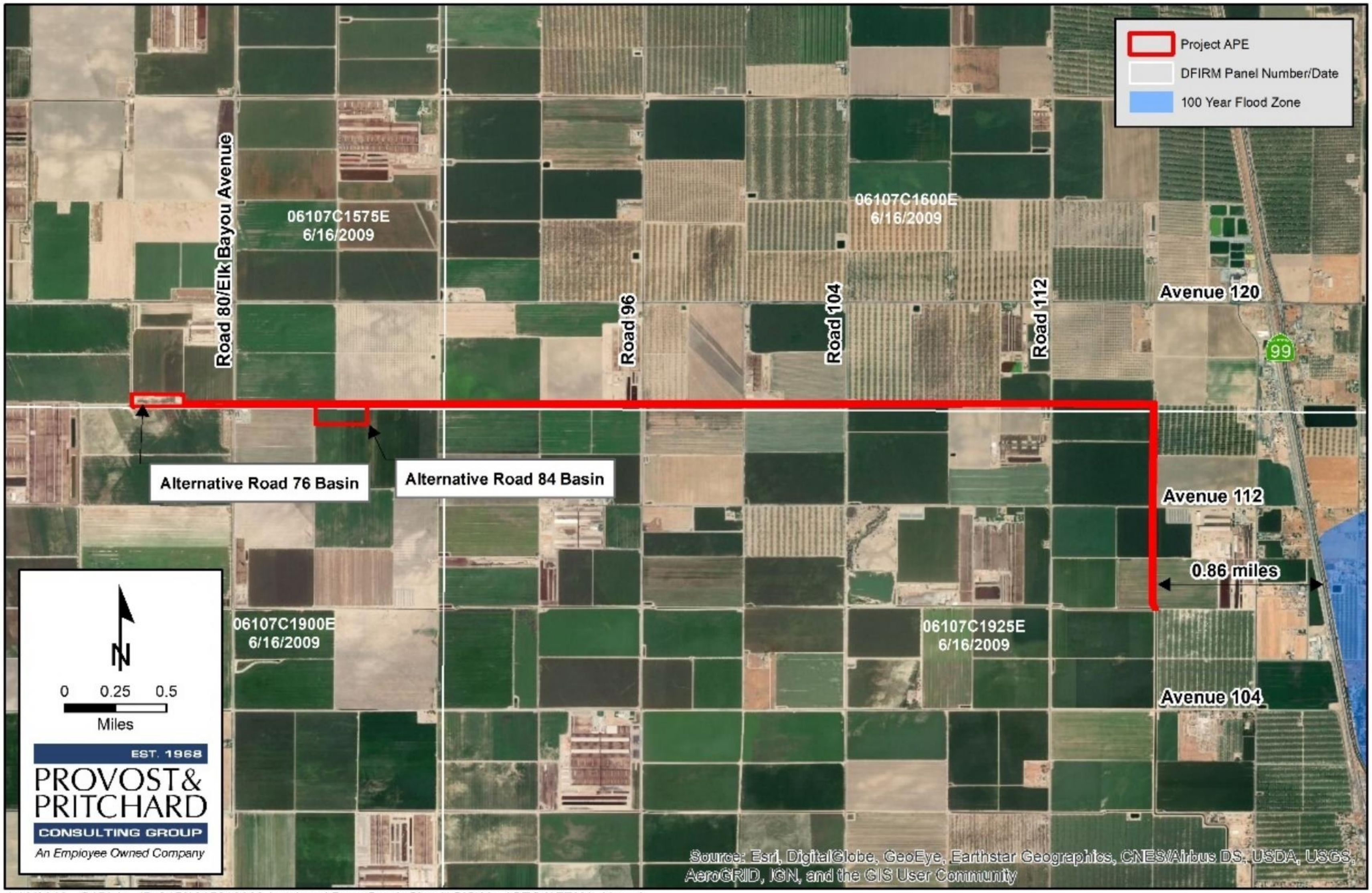
(iv) impede or redirect flood flows?

X-d) Would the project in flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

c-d) Less Than Significant Impact. There are no streams or rivers onsite or in the immediate vicinity of the first phase of the Project. The first phase will consist of excavating, grading, and clearing of lateral 4 and the selected basin alternative. The second phase does not propose any earth moving activities. In order to minimize erosion and run-off during construction activities, a SWPPP will be implemented, and the contractor will comply with all Cal/OSHA regulations regarding regular maintenance and inspection of equipment, spill prevention, and spill remediation in order to reduce the potential for incidental release of pollutants or hazardous substances onsite. Impacts will be less than significant.

X-e) Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

e) No Impact. Construction of this project would diversify PIXID's water resources available for use and will reduce groundwater pumping. The Project will not conflict with or obstruct implementation of any water quality control plan or sustainable groundwater management plan. There will be no impact.



4/10/2019 : G:\Pixley ID-3159\315919002-Lat 4 and Deer Creek Check\GIS\Map\CEQA\FEMA_N.mxd

Figure 3-3. FEMA Map (North)

4/8/2019 : G:\Pixley ID-3159\315919002-Lat 4 and Deer Creek Check\GIS\Map\CEQA\FEMA_S.mxd

Figure 3-4. FEMA Map (South)

3.11 Land Use and Planning

Table 3-20. Land Use and Planning Impacts

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

3.11.1 Environmental Setting

The Project site is located in southern Tulare County west of State Route 99 and northeast of State Route 43 (SR43). The Avenue 116 alignment starting at Road 116 and end between Road 84 and Road 76, with two basin alternatives.

The facility will primarily run along the Avenue 116 alignment starting at Road 116 and end between Road 84 and Road 76, with two basin alternatives. Alternative one is the Road 84 basin, and alternative two is the Road 76 basin. Additionally, the District is pursuing options to retrofit the Deer Creek Check Structure with automated gates for better managing Friant water flows in Deer Creek for beneficial use within the District. Zoned AE-40, Agricultural Exclusive.

3.11.2 Impact Assessment

XI-a) Would the project physically divide an established community?

a) No Impact. The Project will not physically divide any established community. Additionally, the Project would not include any physical improvements such as new streets that would potentially divide any established community. There would be no impact.

XI-b) Would the project cause a significant environmental conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

b) No Impact. The Project involves the development of the surface water delivery system in two phases. The first phase is to develop an open channel, gravity conveyance beginning from the end of the existing West Main Canal and terminate in a basin. During the second phase the District will retrofit the Deer Creek Check Structure with a new automatic gate system for better managing of Friant water flows in Deer Creek for beneficial use within the District. According to the California Government Code §51238 (a)(1), the construction of water facilities are determined to be compatible uses within any agricultural preserve. The Project would include the construction of facilities to be used by the Pixley Irrigation District to expand their delivery surface water delivery to the community. The proposed Project would provide mutual benefit to the District and the census designated place (CDP) of Pixley as both draw water from the same aquifer. There would be no impact.

3.12 Mineral Resources

Table 3-16. Mineral Resources Impacts

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

3.12.1 Environmental Setting

Tulare County is divided into two major physiographic and geologic provinces: the Sierra Nevada Mountains encompassing the majority of the eastern portion of the County and the Central Valley encompassing the majority of the western portion. The foothill area of the County lies between these two regions and is essentially a transition area. The proposed Project site is located within the Central Valley region in the western portion of the County. The central and western parts of the County are underlain by marine and non-marine sedimentary rocks. The Central Valley is basically a flat, alluvial plain, with soil consisting of material deposited by the uplifting of the mountains[23].

Economically, the most important minerals that are extracted in Tulare County are sand, gravel, crushed rock, and natural gas. Aggregate resources are the most valuable mineral resources in the County because they are essential to constructing roads, buildings, and providing for other infrastructure needs. There are three streams that have provided the main source of high quality sand and gravel in Tulare County; the Kaweah River, Lewis Creek and the Tule River. The highest quality deposits are located at the Kaweah and Tule Rivers. Other sources of construction material are also mined in the hard rock deposits of the foothills[24].

The California Department of Conservation, Office of Mine Reclamation (OMR) provides mine information to the public through the Mines Online (MOL) website. The website is an interactive web map designed to provide information such as mine name, operation status, commodities sold, and mine locations. According to the MOL geographic information system (GIS), there are no active mines in the project vicinity.

The closest oil well to Lateral 4 owned by Lews & Clark Expl. Co is 170 feet south of the Lateral 4 phase site and is currently plugged. The second closest non-active well to the Deer Creek phase site is owned by Chevron U.S.A and is 1.1 mile southeast of the project. There are no active wells within two miles of the project site[25] .

[23] Tulare County General Plan 2030 Update Recirculated Draft Environmental Impact Report, Page 3.7-4
[24] Ibid, Page 3.7-9
[25] https://maps.conservation.ca.gov/doggr/wellfinder/#openModal/-119.33260/36.00279/15, accessed May 20, 2019.

3.12.2 Impact Assessment

XII-a) Would the project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

a) No Impact. The proposed Project site is not designated by the State Department of Mines and Geology as a site with known rock and sand resources and requiring protection from development[26]. Neither phase of the proposed Project bring about the loss of any known mineral resources, nor would it result in the loss of access to known mineral resources of value to the region. Such designation has not been conferred on the sites and the proposed Project does not restrict access to the sites for any purpose in the future.

XII-b) Would the project result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

b) No Impact. The Project site is not delineated on a local land use plan as a locally important mineral resource recovery site; therefore, the existence of the project would not result in the loss of availability of any mineral resources. There would be no impact.

[26] https://www.conservation.ca.gov/cgs/Documents/MS_52_California_Aggregates_Map_201807.pdf Accessed May 20, 2019

3.13 Noise

Table 3-21. Noise Impacts

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

3.13.1 Environmental Setting

The Project is located in an unincorporated area of Tulare County, dominated by agricultural production and dairies. State Route 99 is the nearest highway, which is approximately 0.8 miles east from the first phase and 0.06 miles east of second phase.

State Route 43 is approximately 4.13 miles west of the first phase and is approximately 7 miles west of the second phase. The Project is surrounded primarily by agricultural uses and dairies. The Corcoran Municipal Airport is approximately 12.5 miles northwest and a private airstrip is approximately 1.5 miles southeast of the first phase. The Delano Municipal Airport is approximately 11 miles south and a private airstrip is approximately 1.5 miles southeast of the second phase.

3.13.2 Impact Assessment

XIII-a) Would the project result in Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

a) Less Than Significant Impact. Construction of the Project will involve temporary noise sources, originating predominately from off-road equipment, such as excavators, backhoes, graders, skid steers, loaders, and hauling trucks. The Project is located adjacent to agricultural lands, accustomed to noises associated with farm equipment. The Project will comply with the Tulare County General Plan's policy limiting the potential noise impacts of construction activities by limiting construction activities to the hours of 7 am to 7 pm, Monday through Saturday when construction activities are located near sensitive receptors. No construction shall occur on Sundays or national holidays without a permit from the County to minimize noise impacts associated with development near sensitive receptors.[27] Operational maintenance activities

[27] Tulare County General Plan, Health and Safety Element, Page 10-24 http://generalplan.co.tulare.ca.us/documents/GP/001Adopted%20Tulare%20County%20General%20Plan%20Materials/000General%20Plan%202030%20Part%20I%20and%20Part%20II/GENERAL%20PLAN%202012.pdf Accessed April 2, 2019

would be on an as-needed basis with routine monitoring performed by existing staff and would not generate significant new noise. Any impacts would be mild and temporary and therefore, less than significant.

XIII-b) Would the project result in Generation of excessive groundborne vibration or groundborne noise levels?

b) Less Than Significant Impact. The Project is located in an area dominated by agricultural production, which includes the use of off-road equipment and ground-disturbing activities on a regular basis. The majority of construction will involve open trenching of lateral 4 along the alignment of Avenue 116 starting at Road 116 and end between Road 76 or Road 84. Construction will take place intermittently over approximately two years and two months. Conditions created by Project-related construction activities would not vary substantially from the baseline conditions routinely experienced onsite and would be temporary. Any impacts would be less than significant.

XIII-c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

c) No Impact. The Project is not located within an airport land use plan, however, both phases are within two miles of private airstrips. The private airstrips are located 1.5 miles southeast of the first phase and 1.5 miles southeast of the second phase. The private airstrips will have minimal flights and mainly consist of flights used for agricultural uses. Furthermore, the Project does not involve the development of habitable structures or require the presence of permanent staff onsite. There would be no impact

3.14 Population and Housing

Table 3-22. Population and Housing Impacts

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

3.14.1 Environmental Setting

According to 2010 Census data, Tulare County's population was 442,179 with an estimated percent change from 2010 to 2017 of 5.0%. As of 2013 to 2017, there was an average of 135,144 households with an average of 3.35 persons per house.[28]

3.14.2 Impact Assessment

XIV-a) Would the project induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

a) No Impact. The proposed Project involves the development of a surface water conveyance system in Tulare County within the Pixley Irrigation District and does not propose building of any new homes or businesses. According to the County of Tulare General Plan, the County has established policies to cooperate with water agencies in the management of groundwater resources including recharge with the goal of reducing and ultimately reversing groundwater overdraft conditions in the County. These conveyance facilities will not induce population growth. There will be no impact.

XIV-b) Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

b) No Impact. The water conveyance facilities proposed in the Project will not displace any housing or people. There will be no impact.

[28] U.S. Census Data https://www.census.gov/quickfacts/fact/table/tularecountycalifornia/POP010210#POP010210 Accessed March 26, 2019.

3.15 Public Services

Table 3-23. Public Services Impacts

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

3.15.1 Environmental Setting

Fire Protection: The proposed Project area at Lateral 4 would be served by the Tulare County Fire Department Battalion 2 Pixley Fire Station No. 27, located approximately 1.5 miles east of the Project site. The closest fire protection for Deer Creek would be Tulare County Fire Department Battalion 2, Earlimart Fire Station No. 28, which is 2 miles southeast of the site.

Police Protection: Police protection for the project sites is provided Tulare County Pixley Station, located 1.5 miles southeast of the Lateral 4 site and approximately four miles north of the Deer Creek site.

Schools: Public school services are provided throughout Tulare County by 35 school districts, two of which are closet to the two phases. Pixley Middle School is 1.9 miles southeast of Lateral 4. Earlimart Middle School is 1.86 miles southeast of Deer Creek

Parks: Pixley Park, located approximately 1.1 miles southeast of Lateral 4 and Pixley National Wildlife Refuge located 0.5 southwest of the Deer Creek project site.

Landfills: The community of Pixley is served by the Teapot Landfill which is located approximately 11.63 miles east of Lateral 4 site and 12.16 miles northeast of the Deer Creek check structure. It is noted that the Teapot Landfill is approximately 70% capacity and is projected to close sometime in 2020 [29].

[29] https://tularecounty.ca.gov/solidwaste/index.cfm/landfills/locations-fees/, accessed May 20, 2019.

3.15.2 Impact Assessment

XV-a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

a) No Impact.

Fire Protection: The Project Service Areas are located within the Tulare County Fire Department (TCFD) the nearest county station to each site is Station 27 located approximately 1.5 miles east of the Lateral 4 phase site and Station 28 which is located approximately 2 miles southeast of the Deer Creek phase site. There would be no impact.

Police Protection: The District is located in the Tulare County Sheriff's Department law enforcement service area. There is a Tulare County Sheriff's office approximately 1.5 miles southeast of the Lateral 4 phase site and 4 miles north of the Deer Creek phase Project site. No residential or commercial construction or change in existing land use is proposed in this Project. The Project would not impact existing law enforcement services. There would be no impact.

Schools: The closest schools to each phase are Pixley Middle School which is approximately 1.9 miles southeast of the Lateral 4 phase site and Earlimart Middle School which is 1.86 miles southeast of the Deer Creek phase site. The Project sites would not include construction of any residential structures, nor change the existing land use. The Project would not result in an increase of population that would require additional school facilities. There would be no impact.

Parks: The closest parks are Pixley Park located approximately 1.1 miles southeast of the Lateral 4 phase site and Pixley National Wildlife Refuge which is located approximately 0.5 southwest for the Deer Creek phase site. This Project involves the construction of water conveyance facilities and associated appurtenances. The Project will not create a need for additional park or recreational services. There would be no impact.

Other public facilities: The Project would serve to develop a surface water conveyance system through the distribution of surface water to landowners along the new channel and pipeline, benefiting both the community of Pixley and local farmers within the Pixley Irrigation District by reducing groundwater overdraft by both municipal and agricultural uses. The Project would have no sewer needs. Furthermore, the Project would not induce population growth that would require additional need for expanding public facilities. As such, there would be no impact as a result of Project implementation.

The Project would not rely on the addition or alteration of any public services. The subject sites are located in central Tulare County and would utilize existing services provided by the County. No residential or office construction is proposed for this Project. There would be no impact.

3.16 Recreation

Table 3-24. Recreation Impacts

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

3.16.1 Environmental Setting

There are a total of 20 parks and recreation facilities within Tulare County totaling approximately 5,701 acres; 13 are owned and operated by the County, two are State facilities and five are Federal facilities. A number of neighborhood parks, play lots, pocket parks and other recreation facilities are also located within the incorporated cities in the County[30].

3.16.2 Impact Assessment

XVI-a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

a) No Impact. As discussed in Impact XIV-a, no residential or commercial construction is identified with this Project and no change in existing land use is associated with this Project. Additionally, no employees will be stationed at the Project site. Therefore, the Project will not increase the demand for recreational facilities nor put a strain on the existing recreational facilities. There would be no impact.

XVI-b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

b). No Impact. The proposed Project does not include the construction or expansion of recreational facilities. There would be no impact.

[30] Tulare County General Plan Background Report, Pages 4-3 and 4-4

3.17 Transportation

Table 3-25. Transportation/Traffic Impacts

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

3.17.1 Environmental Setting

The Project is in an unincorporated area in southwestern Tulare County, dominated by agricultural production and dairies. State Route 99 is the nearest highway, which is approximately 0.8 miles east of the first phase and 0.06 miles east of the second phase. The Project site is surrounded by agriculture uses.

3.17.2 Impact Assessment

XVII-a) Would the project conflict with a plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

XVII-b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3 Subdivision (b)?

a-b) Less Than Significant Impact. The Project includes the construction of an open channel (lateral 4), gravity conveyance beginning from the end of the existing West Main Canal and terminate in a basin. The facility will primarily run along the Avenue 116 alignment. The second phase will consist of retrofitting the existing Deer Creek Check Structure with automated gates to optimize flow. Construction traffic associated with both phases would be temporary, occurring intermittently over approximately two years and two months. Operational traffic will be minimal. Operational traffic will be on an as-needed basis for maintenance. There would not be a significant adverse effect to existing roadways in the area.

The first phase consists of the construction of one of the two basin alternatives and lateral 4, connecting the West Main Canal to a basin. The lateral will be constructed from the West Main Canal, along the alignment of Road 116 through adjacent property to the north for approximately 0.5 miles, then turning 90° heading west, through adjacent property approximately 0.5 miles along the alignment of Avenue 116. Then it will continue traveling west, along the alignment, for approximately 3.35 miles to Alternative Road 84 Basin or approximately 4.25 miles to Alternative Road 76 Basin. These construction-related impacts would be temporary and alternate routes will be available for use by farm vehicles and vehicles. Although road closures and detours are not anticipated as part of construction. All disturbances to roadways incurred from the Project will be temporary and repaired to its previous condition.

The second phase consists of retrofitting the existing Deer Creek Check Structure with automated gates to optimize flow. There is no population growth associated with the Project, nor will implementation of the Project result in an increase of staff or drivers utilizing roadways in the area. Therefore, implementation of the Project will not increase the demand for any changes to congestion management programs or interfere with existing level of service standards during the operational phase. Construction-related roadway interferences will be less than significant in nature.

XVII-c) Would the project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

c) No Impact. No new roadway design features are associated with the Project. As mentioned in Impact Assessments XVI-a and b above, all potential disturbances to roadways will be temporary and repaired, if necessary. Therefore, there will be no impact.

XVII-d) Would the project result in inadequate emergency access?

d) Less Than Significant Impact. As mentioned above in Impact Assessments XVI-a, b, and c, the Project does not propose new roadway design features or permanent alterations to roadways. All potential disturbances to the alignment of Avenue 116 during construction will be temporary and repaired to its previous condition. Road closures and detours are not proposed. During construction of the new Lateral 4 facility, the alignment may disturb vehicular flow, however, the impacts will be temporary, and detours will be made to property owners and emergency vehicles. The operational phase of the Project will have no effect on roadways or emergency access. Therefore, overall potential Project-related impacts to emergency access on local roadways would be considered less than significant.

3.18 Tribal Cultural Resources

Table 3-26. Tribal Cultural Resources Impacts

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

3.18.1 Environmental Setting

3.18.1.1 Regional Setting

Penutian-speaking Yokuts tribal groups occupied the southern San Joaquin Valley region and much of the nearby Sierra Nevada. For a variety of historical reasons, existing research information emphasizes the central Yokuts tribes who occupied both the valley and particularly the foothills of the Sierra.

Although population estimates vary and population size was greatly affected by the introduction of Euro-American diseases and social disruption, the Yokuts were one of the largest, most successful groups in Native California. Cook estimates that the Yokuts region contained 27 percent of the aboriginal population in the state at the time of contact; other estimates are even higher. Many Yokut descendants continue to live in Tulare, Fresno and Kings counties to this day.

3.18.2 Impact Assessment

XVIII-a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape

that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

XVIII-a-i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)

XVIII-a-ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

a-i-a-ii) Less than Significant Impact with Mitigation Incorporated.

An intensive Class III cultural resources inventory/Phase I survey of the Project area, including parallel survey transects, was conducted by ASM Affiliates, Inc. in April, 2019. A records search was conducted at the Southern San Joaquin Valley Archaeological Information Center, California State University, Bakersfield. A record search of the Native American Heritage Commission (NAHC) Sacred Lands File was also conducted, which resulted in a declaration that no sacred sites or tribal cultural resources are known to exist within the Project site or in the vicinity.

In addition to the record search of the Sacred Lands File, NAHC provided a list of five local Native American Tribes who may have knowledge of cultural resources in the vicinity or general interest in the Project. The following six Tribes were contacted in writing via U.S. Mail with a letter dated May 1, 2019 informing them of the proposed Project.

1. *Kern Valley Indian Community, Lake Isabella, Robert Robinson, Chairperson*
2. *Santa Rosa Rancheria Tachi Yokut Tribe, Rueben Barrios, Sr., Chairperson*
3. *Tubatulabals of Kern County, Robert L. Gomez, Jr., Tribal Chairperson*
4. *Tule River Indian Tribe, Neil Pevron, Chairperson*
5. *Wuksache Indian Tribe, Eshom Valley Band, Kenneth Woodrow, Chairperson*

No comments were received in response to the five letters sent by ASM Affiliates on May 1, 2019. ASM Affiliates, Inc. further attempted to reach each Tribe by telephone or email correspondence on May 22, 2019. One response, by phone call, was received from Mr. Kenneth Woodrow, Chair of the Wuksache Indian Tribe – Eshom Valley Band. He expressed concern for potential buried cultural resources, based on his experience with the High-Speed Rail project. Mr. Woodrow was directed to the Caltrans geoarchaeological study (Meyers et al. 2010) which identifies the buried sensitivity of the Project APE. Follow-up phone calls were also made to other groups on the contact list. No other responses were received from any of the contacts, presumably indicating that there are no additional tribal concerns over the Project. A copy of Tribal correspondence can be found within the Historic Property Identification Report (**Appendix C**).

No archaeological resources were identified by the ASM Affiliates archaeologist during the field survey of the Project area in April 2019. One cultural resource, a segment of Deer Creek including a check-structure proposed for retrofitting, was identified and documented during the survey. This resource is recommended as not NRHP/CRHR eligible.

Additionally, the District has received a letter from the Santa Rosa Rancheria Tachi Yokut Tribe pursuant to Public Resources Code Section 21080.3.1 requesting notification of proposed projects. The Santa Rosa Rancheria Tachi Yokut Tribe has already been contacted in regard to this Project, as discussed above and in sections 3.5 of Chapter 3. As part of meeting the specific AB 52 compliance a second letter will be sent to the tribe on District letterhead.

Therefore, it is concluded, barring evidence to the contrary, that there is little or no chance the Project will cause a substantial adverse change to the significance of a tribal cultural resource as defined. Nonetheless, Mitigation Measures CUL-1 and CUL-2, described above in **Section 3.5**, are recommended in the event cultural materials or human remains are unearthed during excavation or construction.

3.19 Utilities and Service Systems

Table 3-27. Utilities and Service Systems Impacts

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

3.19.1 Environmental Setting

3.19.1.1 Water Supply

The Project lies entirely within the Tule Groundwater Subbasin of the San Joaquin Valley Groundwater Basin.[31] Declines in groundwater basin storage and groundwater overdraft are recurring problems in the Central Valley. Measures for ensuring the continued availability of groundwater for municipal needs have been identified and planned in several areas of the county. The measures include groundwater conservation and recharge, and supplementing or replacing groundwater sources for irrigation with surface water.

3.19.1.2 Wastewater Collection and Treatment

No wastewater will be generated during Project construction or operation.

[31] DWR Bulletin 118 Groundwater Basin Boundary Assessment Tool. https://gis.water.ca.gov/app/bbat/ Accessed April 10, 2019

3.19.1.3 Landfills

The Project is within an unincorporated portion of southern Tulare County. It will be served by Woodville Landfill which is located approximately 11 miles northwest of the first phase and 16 miles north of the second phase of the Project.

3.19.2 Impact Assessment

XIX-a) Would the project require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

a) Less Than Significant Impact. The Project would not require or result in the construction or relocation of new or expanded water, wastewater treatment, or storm water drainage, natural gas or telecommunications facilities. The Project entails the development of an open channel, gravity conveyance beginning from the end of the existing West Main Canal, terminating in one of the two basin alternatives, and the retrofitting of the Deer Creek Check Structure with an automated gate system. The Project will allow surface water to be captured and channeled to a terminal basin in order to use and recharge. There would be no impact.

XIX-b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

b) Less Than Significant Impact. Implementation of the Project will transfer approximately 5,300 acre-feet (AF) per year and the terminal basin can store approximately 90 AF. As previously stated, the Project will serve to store water, so there is surface water available for property owners within the northwestern portion of Pixley Irrigation District. The basin will allow for additional water recharge in the subbasin. There is no anticipated increase in water demand resulting from implementation of the Project. It will not interfere with the production rate of existing wells or water systems on neighboring parcels. Both of the basin alternatives will be located at the western end of lateral 4 (See **Figure 2-3.**). Implementation of the Project will not impede sustainable groundwater management of the San Joaquin Valley Tule subbasin, nor will it substantially decrease ground water supplies. Any impacts will be less than significant.

XIX-c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

c) No Impact. The Project will not create a wastewater demand on any wastewater treatment provider, nor will it require any wastewater treatment facilities at the Project site, there will be no need for any capacity determination by a wastewater treatment provider. There would be no impact.

XIX-d) Would the project generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

d) Less Than Significant Impact. There will not be solid waste associated with the operational phase of the Project. Any waste associated with construction would be minimal and temporary, most of which will be recycled. Therefore, impacts would be less than significant.

XIX-e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

e) No Impact. Implementation of the Project involves the construction of a new water conveyance system and is not anticipated to produce any solid waste. Furthermore, the Project would continue to comply with any federal, State, and local regulations regarding solid waste. There would be no impact.

3.20 Wildfire

Table 3-28. Wildfire Impacts

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

3.20.1 Environmental Setting

The Project is located in an unincorporated area of Tulare County. The Project is in a flat agricultural area of the Central San Joaquin Valley. No structures are being constructed as part of the Project, and the Project is not considered to be population growth inducing.

XX-a) Would the project substantially impair an adopted emergency response plan or emergency evacuation plan?

XX-b) Would the project, due to slope, prevailing winds, or other factors exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from wildfire or the uncontrolled spread of wildfire?

XX-c) Would the project Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

XX-d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

a-d) No Impact. The Project is not located in or near state responsibility areas or lands classified as very high fire hazard severity zones. The nearest State Responsibility Area (SRA) for the first phase is 16 miles to the southeast of the Project. The nearest SRA for the second phase is 13 miles to the southeast of the Project. Additionally, the Project's first phase is approximately 28 miles and the second phase is approximately 30 miles from the nearest Very High classification of Fire Hazard Severity Zone (FHSZ). Therefore, further analysis of the Projects potential impacts to wildfire are not warranted. There would be no impacts.

3.21 CEQA Mandatory Findings of Significance

Table 3-29. Mandatory Findings of Significance Impacts

Mandatory Findings of Significance					
Would the project:		Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b)	Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☒	☐
c)	Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

3.21.1 Impact Assessment

XXI-a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

a) Less Than Significant Impact with Mitigation Incorporated. The analysis conducted in this Initial Study/Mitigated Negative Declaration results in a determination that the Project, with incorporation of mitigation measures, will have a less than significant effect on the environment. The potential for impacts to biological resources, geology and soils, and cultural resources from the implementation of the Project will be less than significant with the incorporation of the mitigation measures discussed in **Chapter 4, Mitigation Monitoring and Reporting Program**. Accordingly, the Project will involve no potential for significant impacts through the degradation of the quality of the environment, the reduction in the habitat or population of fish or wildlife, including endangered plants or animals, the elimination of a plant or animal community or example of a major period of California history or prehistory.

XXI-b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?

b) Less Than Significant Impact. CEQA Guidelines Section 15064(i) States that a Lead Agency shall consider whether the cumulative impact of a project is significant and whether the effects of the project are cumulatively considerable. The assessment of the significance of cumulative effects of a project must be conducted in connection with the effects of past projects, other current projects, and probable future projects. The Project would include the construction an open channel (lateral 4), beginning from the end of the existing West Main Canal and terminate in a basin. The facility will primarily run along the Avenue 116 alignment and terminate in either Road 84 or Road 76 basin alternative. The majority of the lateral will be located along the Avenue 116 alignment. The second phase will consist of retrofitting the existing Deer Creek Check Structure with an automated gate system to optimize flow. No additional roads would be constructed as a result of the Project, nor would any additional public services be required. The Project intends to diversify the water sources available to the Pixley Irrigation District. The Project would not result in direct or indirect population growth. Therefore, implementation of the Project would not result in significant cumulative impacts and all potential impacts would be reduced to less than significant through the implementation of mitigation measures and basic regulatory requirements incorporated into future Project design.

XXI-c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

c) Less than Significant Impact. The Project will develop an open channel (Lateral 4), gravity conveyance beginning from the end of the existing West Main Canal and terminate in a basin. The facility will primarily run along the Avenue 116 alignment and terminate in either Road 84 or Road 76 basin alternative. The second phase will consist of retrofitting the existing Deer Creek Check Structure with an automated gate system to optimize flow. The Project in and of itself would not create a significant hazard to the public or the environment. On the contrary, implementation of the Project would allow the Pixley Irrigation District access to surface water rather than being solely reliant on groundwater pumping. Construction-related air quality/dust exposure impacts could occur temporarily as a result of project construction. However, implementation of basic regulatory requirements identified in this IS/MND would ensure that impacts are less than significant. Therefore, the proposed Project would not have any direct or indirect adverse impacts on humans. This impact would be less than significant.

4 Mitigation Monitoring and Reporting Program

This Mitigation Monitoring and Reporting Program (MMRP) has been formulated based upon the findings of the Initial Study/Mitigated Negative Declaration (IS/MND) for the Pixley Irrigation District (District) New Lateral 4 Facility and Deer Creek Structure Retrofit Project (Project) in Tulare County. The MMRP lists mitigation measures recommended in the IS/MND for the Project and identifies monitoring and reporting requirements.

Table 4-1 presents the mitigation measures identified for the proposed Project. Each mitigation measure is numbered with a symbol indicating the topical section to which it pertains, a hyphen, and the impact number. For example, AIR-2 would be the second mitigation measure identified in the Air Quality analysis of the IS/MND.

The first column of **Table 4-1** identifies the mitigation measure. The second column, entitled "When Monitoring is to Occur," identifies the time the mitigation measure should be initiated. The third column, "Frequency of Monitoring," identifies the frequency of the monitoring of the mitigation measure. The fourth column, "Agency Responsible for Monitoring," names the party ultimately responsible for ensuring that the mitigation measure is implemented. The last columns will be used by the District to ensure that individual mitigation measures have been complied with and monitored.

Table 4-1. Mitigation Monitoring and Reporting Program

Mitigation Monitoring and Reporting Program					
Mitigation Measure/Condition of Approval	**When Monitoring is to Occur**	**Frequency of Monitoring**	**Agency Responsible for Monitoring**	**Method to Verify Compliance**	**Verification of Compliance**
Biological Resources					
Mitigation Measure BIO-1: Worker Environmental Action Plan (WEAP) Training					
Prior to initiating construction activities (including staging and mobilization), all personnel associated with Project construction shall attend mandatory Worker Environmental Awareness Program (WEAP) training, conducted by a qualified biologist, to aid workers in identifying special status resources that may occur in the Project area. The specifics of this program shall include identification of the sensitive species and suitable habitats, a description of the regulatory status and general ecological characteristics of sensitive resources, and review of the limits of construction and mitigation measures required to reduce impacts to biological resources within the work area. A fact sheet conveying this information, along with photographs or illustrations of sensitive species with potential to occur onsite, shall also be prepared for distribution to all contractors, their employees, and all other personnel involved with construction of the Project. All employees shall sign a form documenting that they have attended WEAP training and understand the information presented to them.	Prior to the start of construction and during construction upon arrival of new personnel	Prior to the start of construction and during construction upon arrival of new personnel	Pixley Irrigation District		
Mitigation Measure BIO-1b: Construction Operational Hours					
Construction shall be conducted during daylight hours to reduce disturbance to wildlife that could be foraging within work areas.	During construction		Pixley Irrigation District		
Mitigation Measure BIO-2a: Avoidance of Nesting Bird Season					
The Project's construction activities shall occur, if feasible, between September 16 and January 31 (outside of nesting bird season) in an effort to avoid impacts to nesting birds.	During construction activities	Daily, during construction activities	Pixley Irrigation District		
Mitigation Measure BIO-2b: Pre-Construction Nesting Bird Survey					
If activities must occur within nesting bird season (February 1 to September 15), a qualified biologist shall conduct pre-construction surveys for active nests within 30 days prior to the start of construction. The survey shall include the proposed work area and surrounding lands within 0.5 mile. If no active nests are observed, no further mitigation is required. Raptor nests are considered "active" upon the nest-building stage.	Within 30 days prior to the start of work performed from February 1 to September 15	Once	Pixley Irrigation District		

Mitigation Monitoring and Reporting Program					
Mitigation Measure/Condition of Approval	When Monitoring is to Occur	Frequency of Monitoring	Agency Responsible for Monitoring	Method to Verify Compliance	Verification of Compliance
Mitigation Measure BIO-2c: Establish Nest Buffers					
On discovery of any active nests near work areas, the biologist shall determine appropriate construction setback distances based on applicable CDFW and/or USFWS guidelines and/or the biology of the species in question. Construction buffers shall be identified with flagging, fencing, or other easily visible means, and shall be maintained until the biologist has determined that the nestlings have fledged.	On discovery of active nests	Once, per nest, or more frequently as determined by biologist	Pixley Irrigation District		
Mitigation Measure BIO-3a Burrowing Owl Pre-construction Take Avoidance Survey					
A qualified biologist shall conduct a pre-construction take avoidance survey for burrowing owls and suitable burrows, in accordance with CDFW's Staff Report on Burrowing Owl Mitigation (2012), within 30 days prior to the start of construction activities. The survey shall include the proposed work area and surrounding lands within 500 feet. If no burrowing owl individuals or suitable burrows are observed, no further mitigation is required.	Within 30 days prior to the start of work	Once	Pixley Irrigation District		
Mitigation Measure BIO-3b Burrowing Owl Avoidance					
If an active burrowing owl burrow is detected, the occurrence shall be reported to the local CDFW office and the CNDDB, and disturbance-free buffers shall be implemented in accordance with CDFW's 2012 Staff Report on Burrowing Owl Mitigation, as outlined in the table 3-10.	On discovery of active burrow	Once, per burrow, or more frequently as determined by biologist	Pixley Irrigation District		
Mitigation Measure BIO-3c Burrowing Owl Consultation with CDFW and Passive Relocation					
If avoidance of an active burrowing owl burrow is not feasible, CDFW shall be immediately consulted to determine the best course of action, which may include passive relocation during non-breeding season. Passive relocation and/or burrow exclusion shall not take place without coordination with CDFW and preparation of an approved exclusion and relocation plan.			Pixley Irrigation District		
Mitigation Measure BIO-4a Burrowing Mammals Burrow Survey:					
Within 30 days prior to the start of construction, a pre-construction survey for San Joaquin kit fox and American badger individuals and suitable burrows shall be conducted on and within 200 feet of proposed work areas. Any burrows within the survey area that are determined to be suitable for use by the San Joaquin kit fox or American badger shall be monitored for a period of three days using tracking medium and/or remotely-triggered cameras. If an active kit fox or American badger den is detected within or adjacent to the Project area, construction will be delayed, and CDFW and USFWS shall be consulted to determine the best course of action.	Within 30 days prior to the start of work	Once	Pixley Irrigation District		

Mitigation Monitoring and Reporting Program					
Mitigation Measure/Condition of Approval	When Monitoring is to Occur	Frequency of Monitoring	Agency Responsible for Monitoring	Method to Verify Compliance	Verification of Compliance
Mitigation Measure BIO-4b Burrowing Mammals Minimization					
The Project shall observe all minimization and protective measures from the Construction and On-Going Operational Requirements of the USFWS 2011 *Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance*, including, but not limited to: construction speed limits, covering of pipes, installation of escape structures, restriction of herbicide and rodenticide use, proper disposal of food items and trash, prohibition of pets and firearms, and completion of an employee education program.	On discovery of active burrow	Once, per burrow, or more frequently as determined by biologist	Pixley Irrigation District		
Mitigation Measure BIO-4c Burrowing Mammals Mortality Reporting					
The Sacramento Field Office of USFWS and the Fresno Field Office of CDFW will be notified in writing within three working days in the case of the accidental death or injury to a San Joaquin kit fox or American badger during construction. Notification must include the date, time, and location of the incident and any other pertinent information.	On discovery of death or injury to a San Joaquin kit fox or American badger during construction.		Pixley Irrigation District		
Mitigation Measure BIO-5 Special Status Reptiles Pre-construction Survey					
A qualified biologist will perform a pre-construction survey for special status reptiles and amphibians with potential to occur onsite (blunt-nosed leopard lizard, Bakersfield legless lizard, coast horned lizard, and western spadefoot) within 30 days prior to the start of construction. The survey will cover all Project areas, including ingress/egress routes, staging areas, and 500-foot radius. If no special status reptiles or amphibians are observed, construction may begin. If special status reptiles and/or amphibians are observed during the pre-construction survey, all construction activities shall be delayed, and CDFW shall be consulted to determine the best course of action.	Within 30 days prior to the start of work	Once	Pixley Irrigation District		

Mitigation Monitoring and Reporting Program					
Mitigation Measure/Condition of Approval	**When Monitoring is to Occur**	**Frequency of Monitoring**	**Agency Responsible for Monitoring**	**Method to Verify Compliance**	**Verification of Compliance**
Cultural Resources					
Mitigation Measure CUL-1: Archaeological Resources					
In the event that archaeological resources are encountered at any time during development or ground-moving activities within the entire project area, all work in the vicinity of the find shall halt until a qualified archaeologist can assess the discovery. The District shall implement all recommendations of the archaeologist necessary to avoid or reduce to a less than significant level potential impacts to cultural resource. Appropriate actions could include a Data Recovery Plan or preservation in place.	In the event archaeological resources are uncovered	During excavation	Pixley Irrigation District		
Mitigation Measure CUL-2: Human Remains					
If human remains are uncovered, or in any other case when human remains are discovered during construction, the Tulare County Coroner is to be notified to arrange proper treatment and disposition. If the remains are identified—on the basis of archaeological context, age, cultural associations, or biological traits—as those of a Native American, California Health and Safety Code 7050.5 and Public Resource Code 5097.98 require that the coroner notify the NAHC within 24 hours of discovery. The NAHC will then identify the Most Likely Descendent who will determine the manner in which the remains are treated.	In the event human remains are uncovered	During excavation	Pixley Irrigation District		

Appendix A

Air Quality and Greenhouse Gas Emissions

PIXID Lateral 4/Deer Creek Project

Tulare County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	85.00	Acre	85.00	3,702,600.00	0
Other Non-Asphalt Surfaces	1.00	Acre	1.00	43,560.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	51
Climate Zone	7			**Operational Year**	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Two years of construction for the Lateral 4 and Basin. Two months of construction for the retrofit of the Deer Creek Structure.

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	155.00	363.00
tblConstructionPhase	NumDays	60.00	104.00
tblConstructionPhase	PhaseEndDate	12/14/2020	12/1/2021
tblConstructionPhase	PhaseEndDate	5/11/2020	7/10/2020
tblConstructionPhase	PhaseStartDate	5/12/2020	7/11/2020
tblGrading	AcresOfGrading	907.50	387.50

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.1185	1.1826	0.7460	1.3200e-003	3.9400e-003	0.0593	0.0632	1.0500e-003	0.0551	0.0562	0.0000	117.7617	117.7617	0.0319	0.0000	118.5595
2020	0.5557	5.8900	3.5476	6.6600e-003	1.5377	0.2774	1.8150	0.7490	0.2555	1.0044	0.0000	586.0747	586.0747	0.1823	0.0000	590.6325
2021	0.5112	5.5515	3.7586	7.5900e-003	0.9442	0.2374	1.1815	0.4228	0.2184	0.6412	0.0000	667.0581	667.0581	0.2111	0.0000	672.3348
Maximum	**0.5557**	**5.8900**	**3.7586**	**7.5900e-003**	**1.5377**	**0.2774**	**1.8150**	**0.7490**	**0.2555**	**1.0044**	**0.0000**	**667.0581**	**667.0581**	**0.2111**	**0.0000**	**672.3348**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.1185	1.1826	0.7460	1.3200e-003	3.9400e-003	0.0593	0.0632	1.0500e-003	0.0551	0.0562	0.0000	117.7615	117.7615	0.0319	0.0000	118.5594
2020	0.5557	5.8900	3.5476	6.6600e-003	0.7026	0.2774	0.9800	0.3399	0.2555	0.5953	0.0000	586.0740	586.0740	0.1823	0.0000	590.6318
2021	0.5112	5.5514	3.7586	7.5900e-003	0.4353	0.2374	0.6727	0.1931	0.2184	0.4114	0.0000	667.0573	667.0573	0.2111	0.0000	672.3340
Maximum	**0.5557**	**5.8900**	**3.7586**	**7.5900e-003**	**0.7026**	**0.2774**	**0.9800**	**0.3399**	**0.2555**	**0.5953**	**0.0000**	**667.0573**	**667.0573**	**0.2111**	**0.0000**	**672.3340**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**54.06**	**0.00**	**43.92**	**54.47**	**0.00**	**37.54**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**10-1-2019**	**12-31-2019**	1.2958	1.2958
2	**1-1-2020**	**3-31-2020**	1.3444	1.3444
3	**4-1-2020**	**6-30-2020**	1.5159	1.5159
4	**7-1-2020**	**9-30-2020**	1.7719	1.7719
5	**10-1-2020**	**12-31-2020**	1.8011	1.8011
6	**1-1-2021**	**3-31-2021**	1.6310	1.6310
7	**4-1-2021**	**6-30-2021**	1.6491	1.6491
8	**7-1-2021**	**9-30-2021**	1.6672	1.6672
		Highest	1.8011	1.8011

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3204	1.0000e-005	7.9000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.5400e-003	1.5400e-003	0.0000	0.0000	1.6400e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.3204**	**1.0000e-005**	**7.9000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.5400e-003**	**1.5400e-003**	**0.0000**	**0.0000**	**1.6400e-003**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3204	1.0000e-005	7.9000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.5400e-003	1.5400e-003	0.0000	0.0000	1.6400e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.3204**	**1.0000e-005**	**7.9000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.5400e-003**	**1.5400e-003**	**0.0000**	**0.0000**	**1.6400e-003**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	10/1/2019	2/17/2020	5	100	
2	Site Preparation	Site Preparation	2/18/2020	7/10/2020	5	104	
3	Grading	Grading	7/11/2020	12/1/2021	5	363	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 387.5

Acres of Paving: 86

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

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Excavators	3	8.00	158	0.38
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Excavators	2	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Graders	1	8.00	187	0.41
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48

<u>Trips and VMT</u>

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1159	1.1808	0.7280	1.2800e-003		0.0592	0.0592		0.0551	0.0551	0.0000	114.2669	114.2669	0.0318	0.0000	115.0616
Total	**0.1159**	**1.1808**	**0.7280**	**1.2800e-003**		**0.0592**	**0.0592**		**0.0551**	**0.0551**	**0.0000**	**114.2669**	**114.2669**	**0.0318**	**0.0000**	**115.0616**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.5900e-003	1.7800e-003	0.0181	4.0000e-005	3.9400e-003	3.0000e-005	3.9700e-003	1.0500e-003	3.0000e-005	1.0800e-003	0.0000	3.4948	3.4948	1.2000e-004	0.0000	3.4979
Total	**2.5900e-003**	**1.7800e-003**	**0.0181**	**4.0000e-005**	**3.9400e-003**	**3.0000e-005**	**3.9700e-003**	**1.0500e-003**	**3.0000e-005**	**1.0800e-003**	**0.0000**	**3.4948**	**3.4948**	**1.2000e-004**	**0.0000**	**3.4979**

3.2 Demolition - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1159	1.1808	0.7280	1.2800e-003		0.0592	0.0592		0.0551	0.0551	0.0000	114.2668	114.2668	0.0318	0.0000	115.0615
Total	**0.1159**	**1.1808**	**0.7280**	**1.2800e-003**		**0.0592**	**0.0592**		**0.0551**	**0.0551**	**0.0000**	**114.2668**	**114.2668**	**0.0318**	**0.0000**	**115.0615**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.5900e-003	1.7800e-003	0.0181	4.0000e-005	3.9400e-003	3.0000e-005	3.9700e-003	1.0500e-003	3.0000e-005	1.0800e-003	0.0000	3.4948	3.4948	1.2000e-004	0.0000	3.4979
Total	**2.5900e-003**	**1.7800e-003**	**0.0181**	**4.0000e-005**	**3.9400e-003**	**3.0000e-005**	**3.9700e-003**	**1.0500e-003**	**3.0000e-005**	**1.0800e-003**	**0.0000**	**3.4948**	**3.4948**	**1.2000e-004**	**0.0000**	**3.4979**

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0563	0.5644	0.3698	6.6000e-004		0.0282	0.0282		0.0262	0.0262	0.0000	57.7976	57.7976	0.0163	0.0000	58.2055
Total	**0.0563**	**0.5644**	**0.3698**	**6.6000e-004**		**0.0282**	**0.0282**		**0.0262**	**0.0262**	**0.0000**	**57.7976**	**57.7976**	**0.0163**	**0.0000**	**58.2055**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2000e-003	8.0000e-004	8.1500e-003	2.0000e-005	2.0300e-003	1.0000e-005	2.0500e-003	5.4000e-004	1.0000e-005	5.5000e-004	0.0000	1.7449	1.7449	5.0000e-005	0.0000	1.7463
Total	**1.2000e-003**	**8.0000e-004**	**8.1500e-003**	**2.0000e-005**	**2.0300e-003**	**1.0000e-005**	**2.0500e-003**	**5.4000e-004**	**1.0000e-005**	**5.5000e-004**	**0.0000**	**1.7449**	**1.7449**	**5.0000e-005**	**0.0000**	**1.7463**

3.2 Demolition - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0563	0.5644	0.3698	6.6000e-004		0.0282	0.0282		0.0262	0.0262	0.0000	57.7976	57.7976	0.0163	0.0000	58.2055
Total	**0.0563**	**0.5644**	**0.3698**	**6.6000e-004**		**0.0282**	**0.0282**		**0.0262**	**0.0262**	**0.0000**	**57.7976**	**57.7976**	**0.0163**	**0.0000**	**58.2055**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2000e-003	8.0000e-004	8.1500e-003	2.0000e-005	2.0300e-003	1.0000e-005	2.0500e-003	5.4000e-004	1.0000e-005	5.5000e-004	0.0000	1.7449	1.7449	5.0000e-005	0.0000	1.7463
Total	**1.2000e-003**	**8.0000e-004**	**8.1500e-003**	**2.0000e-005**	**2.0300e-003**	**1.0000e-005**	**2.0500e-003**	**5.4000e-004**	**1.0000e-005**	**5.5000e-004**	**0.0000**	**1.7449**	**1.7449**	**5.0000e-005**	**0.0000**	**1.7463**

3.3 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.9395	0.0000	0.9395	0.5164	0.0000	0.5164	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2120	2.2057	1.1187	1.9800e-003		0.1143	0.1143		0.1051	0.1051	0.0000	173.8395	173.8395	0.0562	0.0000	175.2451
Total	**0.2120**	**2.2057**	**1.1187**	**1.9800e-003**	**0.9395**	**0.1143**	**1.0537**	**0.5164**	**0.1051**	**0.6215**	**0.0000**	**173.8395**	**173.8395**	**0.0562**	**0.0000**	**175.2451**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.4200e-003	2.9400e-003	0.0299	7.0000e-005	7.4600e-003	5.0000e-005	7.5100e-003	1.9800e-003	5.0000e-005	2.0300e-003	0.0000	6.4049	6.4049	2.0000e-004	0.0000	6.4099
Total	**4.4200e-003**	**2.9400e-003**	**0.0299**	**7.0000e-005**	**7.4600e-003**	**5.0000e-005**	**7.5100e-003**	**1.9800e-003**	**5.0000e-005**	**2.0300e-003**	**0.0000**	**6.4049**	**6.4049**	**2.0000e-004**	**0.0000**	**6.4099**

3.3 Site Preparation - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4228	0.0000	0.4228	0.2324	0.0000	0.2324	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2120	2.2057	1.1187	1.9800e-003		0.1143	0.1143		0.1051	0.1051	0.0000	173.8393	173.8393	0.0562	0.0000	175.2449
Total	**0.2120**	**2.2057**	**1.1187**	**1.9800e-003**	**0.4228**	**0.1143**	**0.5370**	**0.2324**	**0.1051**	**0.3375**	**0.0000**	**173.8393**	**173.8393**	**0.0562**	**0.0000**	**175.2449**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.4200e-003	2.9400e-003	0.0299	7.0000e-005	7.4600e-003	5.0000e-005	7.5100e-003	1.9800e-003	5.0000e-005	2.0300e-003	0.0000	6.4049	6.4049	2.0000e-004	0.0000	6.4099
Total	**4.4200e-003**	**2.9400e-003**	**0.0299**	**7.0000e-005**	**7.4600e-003**	**5.0000e-005**	**7.5100e-003**	**1.9800e-003**	**5.0000e-005**	**2.0300e-003**	**0.0000**	**6.4049**	**6.4049**	**2.0000e-004**	**0.0000**	**6.4099**

3.4 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5788	0.0000	0.5788	0.2274	0.0000	0.2274	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2759	3.1123	1.9814	3.8400e-003		0.1348	0.1348		0.1240	0.1240	0.0000	337.8026	337.8026	0.1093	0.0000	340.5339
Total	**0.2759**	**3.1123**	**1.9814**	**3.8400e-003**	**0.5788**	**0.1348**	**0.7136**	**0.2274**	**0.1240**	**0.3514**	**0.0000**	**337.8026**	**337.8026**	**0.1093**	**0.0000**	**340.5339**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.8500e-003	3.9000e-003	0.0396	9.0000e-005	9.8800e-003	7.0000e-005	9.9500e-003	2.6300e-003	6.0000e-005	2.6900e-003	0.0000	8.4851	8.4851	2.7000e-004	0.0000	8.4918
Total	**5.8500e-003**	**3.9000e-003**	**0.0396**	**9.0000e-005**	**9.8800e-003**	**7.0000e-005**	**9.9500e-003**	**2.6300e-003**	**6.0000e-005**	**2.6900e-003**	**0.0000**	**8.4851**	**8.4851**	**2.7000e-004**	**0.0000**	**8.4918**

3.4 Grading - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2605	0.0000	0.2605	0.1023	0.0000	0.1023	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2759	3.1122	1.9814	3.8400e-003		0.1348	0.1348		0.1240	0.1240	0.0000	337.8022	337.8022	0.1093	0.0000	340.5335
Total	**0.2759**	**3.1122**	**1.9814**	**3.8400e-003**	**0.2605**	**0.1348**	**0.3953**	**0.1023**	**0.1240**	**0.2263**	**0.0000**	**337.8022**	**337.8022**	**0.1093**	**0.0000**	**340.5335**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.8500e-003	3.9000e-003	0.0396	9.0000e-005	9.8800e-003	7.0000e-005	9.9500e-003	2.6300e-003	6.0000e-005	2.6900e-003	0.0000	8.4851	8.4851	2.7000e-004	0.0000	8.4918
Total	**5.8500e-003**	**3.9000e-003**	**0.0396**	**9.0000e-005**	**9.8800e-003**	**7.0000e-005**	**9.9500e-003**	**2.6300e-003**	**6.0000e-005**	**2.6900e-003**	**0.0000**	**8.4851**	**8.4851**	**2.7000e-004**	**0.0000**	**8.4918**

3.4 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.9251	0.0000	0.9251	0.4178	0.0000	0.4178	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.5009	5.5448	3.6900	7.4100e-003		0.2373	0.2373		0.2183	0.2183	0.0000	651.2150	651.2150	0.2106	0.0000	656.4804
Total	**0.5009**	**5.5448**	**3.6900**	**7.4100e-003**	**0.9251**	**0.2373**	**1.1624**	**0.4178**	**0.2183**	**0.6360**	**0.0000**	**651.2150**	**651.2150**	**0.2106**	**0.0000**	**656.4804**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0104	6.6700e-003	0.0686	1.8000e-004	0.0190	1.3000e-004	0.0192	5.0600e-003	1.2000e-004	5.1800e-003	0.0000	15.8430	15.8430	4.5000e-004	0.0000	15.8544
Total	**0.0104**	**6.6700e-003**	**0.0686**	**1.8000e-004**	**0.0190**	**1.3000e-004**	**0.0192**	**5.0600e-003**	**1.2000e-004**	**5.1800e-003**	**0.0000**	**15.8430**	**15.8430**	**4.5000e-004**	**0.0000**	**15.8544**

3.4 Grading - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4163	0.0000	0.4163	0.1880	0.0000	0.1880	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.5008	5.5448	3.6900	7.4100e-003		0.2373	0.2373		0.2183	0.2183	0.0000	651.2143	651.2143	0.2106	0.0000	656.4797
Total	**0.5008**	**5.5448**	**3.6900**	**7.4100e-003**	**0.4163**	**0.2373**	**0.6536**	**0.1880**	**0.2183**	**0.4063**	**0.0000**	**651.2143**	**651.2143**	**0.2106**	**0.0000**	**656.4797**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0104	6.6700e-003	0.0686	1.8000e-004	0.0190	1.3000e-004	0.0192	5.0600e-003	1.2000e-004	5.1800e-003	0.0000	15.8430	15.8430	4.5000e-004	0.0000	15.8544
Total	**0.0104**	**6.6700e-003**	**0.0686**	**1.8000e-004**	**0.0190**	**1.3000e-004**	**0.0192**	**5.0600e-003**	**1.2000e-004**	**5.1800e-003**	**0.0000**	**15.8430**	**15.8430**	**4.5000e-004**	**0.0000**	**15.8544**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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

4.2 Trip Summary Information

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

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.516727	0.033517	0.172440	0.141085	0.022326	0.005434	0.020884	0.078233	0.001822	0.001311	0.004327	0.001132	0.000761

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

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

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.3204	1.0000e-005	7.9000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.5400e-003	1.5400e-003	0.0000	0.0000	1.6400e-003
Unmitigated	0.3204	1.0000e-005	7.9000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.5400e-003	1.5400e-003	0.0000	0.0000	1.6400e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0781					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2422					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	7.0000e-005	1.0000e-005	7.9000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.5400e-003	1.5400e-003	0.0000	0.0000	1.6400e-003
Total	**0.3204**	**1.0000e-005**	**7.9000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.5400e-003**	**1.5400e-003**	**0.0000**	**0.0000**	**1.6400e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0781					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2422					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	7.0000e-005	1.0000e-005	7.9000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.5400e-003	1.5400e-003	0.0000	0.0000	1.6400e-003
Total	**0.3204**	**1.0000e-005**	**7.9000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.5400e-003**	**1.5400e-003**	**0.0000**	**0.0000**	**1.6400e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Appendix B

Biological Evaluation Report

Portions of this report have been redacted in order to protect the locations of sensitive resources.

Pixley Irrigation District: Lateral 4 and Deer Creek Check Structure Project

Biological Evaluation

Prepared by:

Brooke Fletcher, Wildlife Biologist

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CONSULTING GROUP
An Employee Owned Company

April 2019

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APPENDICES

LIST OF FIGURES

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1 Introduction

The Pixley Irrigation District (District) was formed in 1958 and is an agricultural irrigation district which covers over 69,500 acres, and over 67 miles of canals and rivers in southern Tulare County. Deer Creek, a local ephemeral stream, flows from east to west through the middle of the District.

The following technical report, prepared by Provost & Pritchard Consulting Group, in compliance with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA), includes a description of the biological resources present or with potential to occur within the Project site and surrounding areas and evaluates potential Project-related impacts to those resources.

1.1 Project Description

The District recently performed a feasibility study for developing surface water delivery system alternatives for the northwestern portion of the District. This area of the District does not have access to surface water and therefore is entirely reliant on groundwater pumping. The District is pursing development of a surface water delivery system in phases. The first phase is to develop an open channel, gravity conveyance beginning from the end of the existing West Main Canal and terminate in a basin. The facility will primarily run along the Avenue 116 alignment starting at Road 116 and end between Road 84 and Road 76, with two basin alternatives. Alternative one is the Road 84 basin, and alternative two is the Road 76 basin. Additionally, the District is pursuing options to retrofit the Deer Creek Check Structure with automated gates for better managing Friant water flows in Deer Creek for beneficial use within the District.

Construction of the Project will be completed in two phases. Phase one (lateral 4 and basin) is anticipated to be completed within two years, which will include grading, site preparation, trenching, connection to the existing distribution system, and development of a water recharge basin (either alternative one or alternative two). Construction equipment will likely include excavators, backhoes, graders, skid steers, loaders, and hauling trucks. Phase two (Deer Creek Check Structure Retrofit) is anticipated to be completed within two months. Construction will involve installation of the new bladder gate into the check structure for automation.

1.2 Report Objectives

Construction activities such as that proposed by Pixley Irrigation District could potentially damage biological resources or modify habitats that are crucial for sensitive plant and wildlife species. In cases such as these, development may be regulated by state or federal agencies, subject to provisions of California Environmental Quality Act (CEQA), and/or National Environmental Policy Act (NEPA), and/or addressed by local regulatory agencies. In the case of Pixley Irrigation District: Lateral 4 and Deer Creek Project, environmental review under both CEQA and NEPA are required.

This report addresses issues related to the following:

1) The presence of sensitive biological resources onsite, or with the potential to occur onsite.
2) The federal, state, and local regulations regarding these resources.
3) Mitigation measures that may be required to reduce the magnitude of anticipated impacts and/or comply with permit requirements of state and federal resource agencies.

Therefore, the objectives of this report are:

1) Summarize all site-specific information related to existing biological resources.

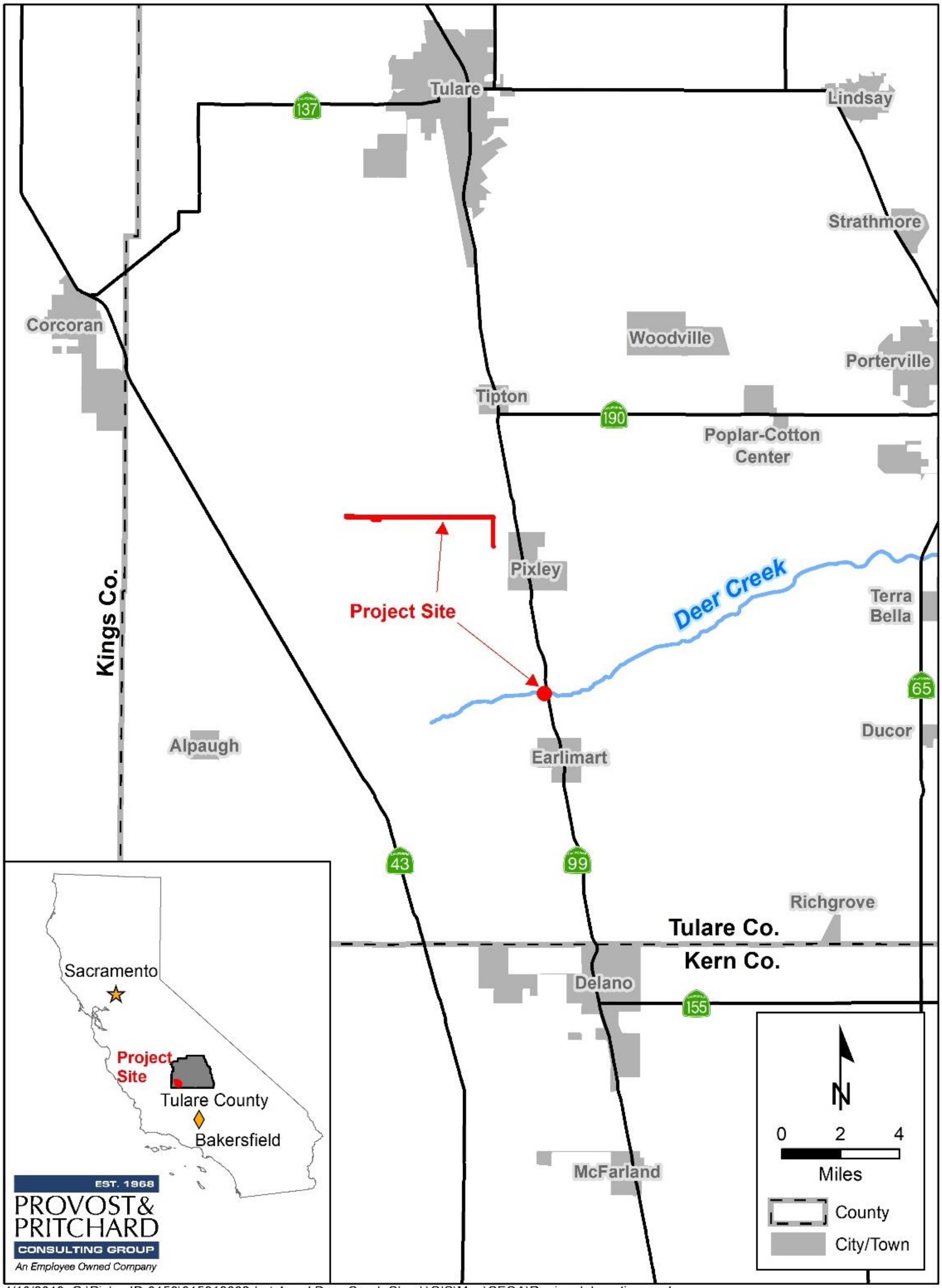
2) Make reasonable inferences about the biological resources that could occur onsite based on habitat suitability and the proximity of the site to a species' known range.
3) Summarize all state and federal natural resource protection laws that may be relevant to the Project.
4) Identify and discuss Project impacts to biological resources likely to occur onsite within the context of CEQA or state or federal laws.
5) Identify and publish a set of avoidance and mitigation measures that would reduce impacts to a less-than-significant level (as identified by CEQA) and are generally consistent with recommendations of the resource agencies for affected biological resources.

1.3 Study Methodology

A reconnaissance-level field survey of the Project sites and surrounding areas was conducted on March 15, 2019 by Provost & Pritchard biologist, Brooke Fletcher. The survey consisted of walking through the Project areas while identifying and noting land uses, biological habitats and communities, and plant and animal species encountered. Furthermore, the site and surrounding areas were assessed for suitable habitats of various wildlife species.

Mrs. Fletcher conducted an analysis of potential Project-related impacts to biological resources based on the resources known to exist or with potential to exist within the Project site and surrounding areas. Sources of information used in preparation of this analysis included: the California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB); the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) system; the California Native Plant Society (CNPS) Online Inventory of Rare and Endangered Vascular Plants of California; CalFlora's online database of California native plants; the Jepson Herbarium online database (Jepson eFlora); U.S. Fish and Wildlife Service (USFWS) Environmental Conservation Online System (ECOS); the NatureServe Explorer online database; the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Plants Database; the California Department of Fish and Wildlife (CDFW) California Wildlife Habitat Relationships (CWHR) database; the California Herps online database; and various manuals, reports, and references related to plants and animals of the San Joaquin Valley region.

The field investigation did not include a wetland delineation or focused surveys for special status species. The field survey conducted included an appropriate level of detail to assess the significance of potential impacts to sensitive biological resources resulting from the Project. Furthermore, the field survey was sufficient to generally describe those features of the Project that could be subject to the jurisdiction of federal and/or State agencies, such as the U.S. Army Corps of Engineers (USACE), CDFW, and the Regional Water Quality Control Board (RWQCB).



4/10/2019: G:\Pixley ID-3159\315919002-Lat 4 and Deer Creek Check\GIS\Map\CEQA\Regional_Location.mxd

Figure 1. Regional Location

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Aerial Imagery: USDA NAIP 2016

Figure 2. Overview of Project Areas

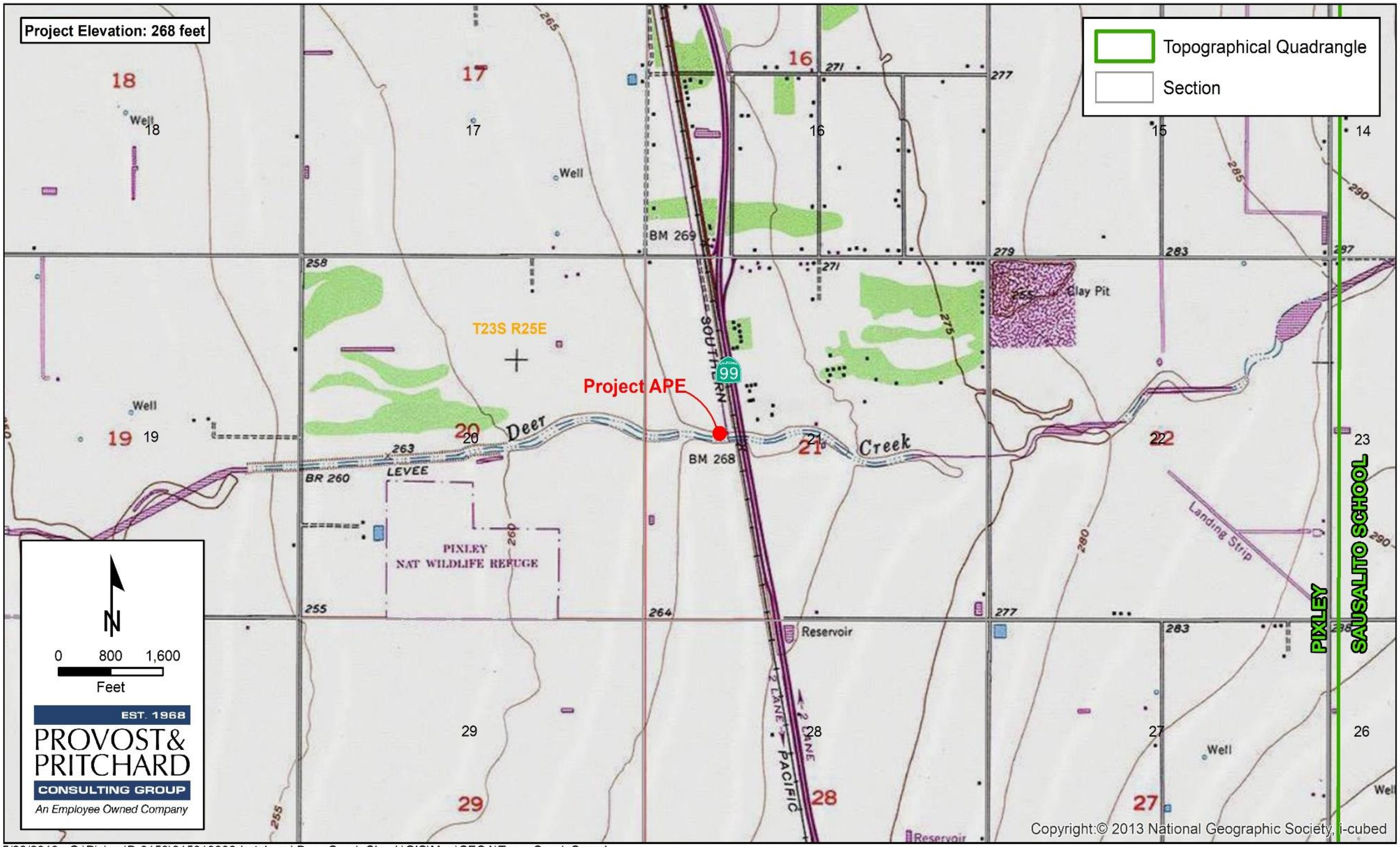

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Figure 3. Topographic Quadrangle Map of Deer Creek Project Area

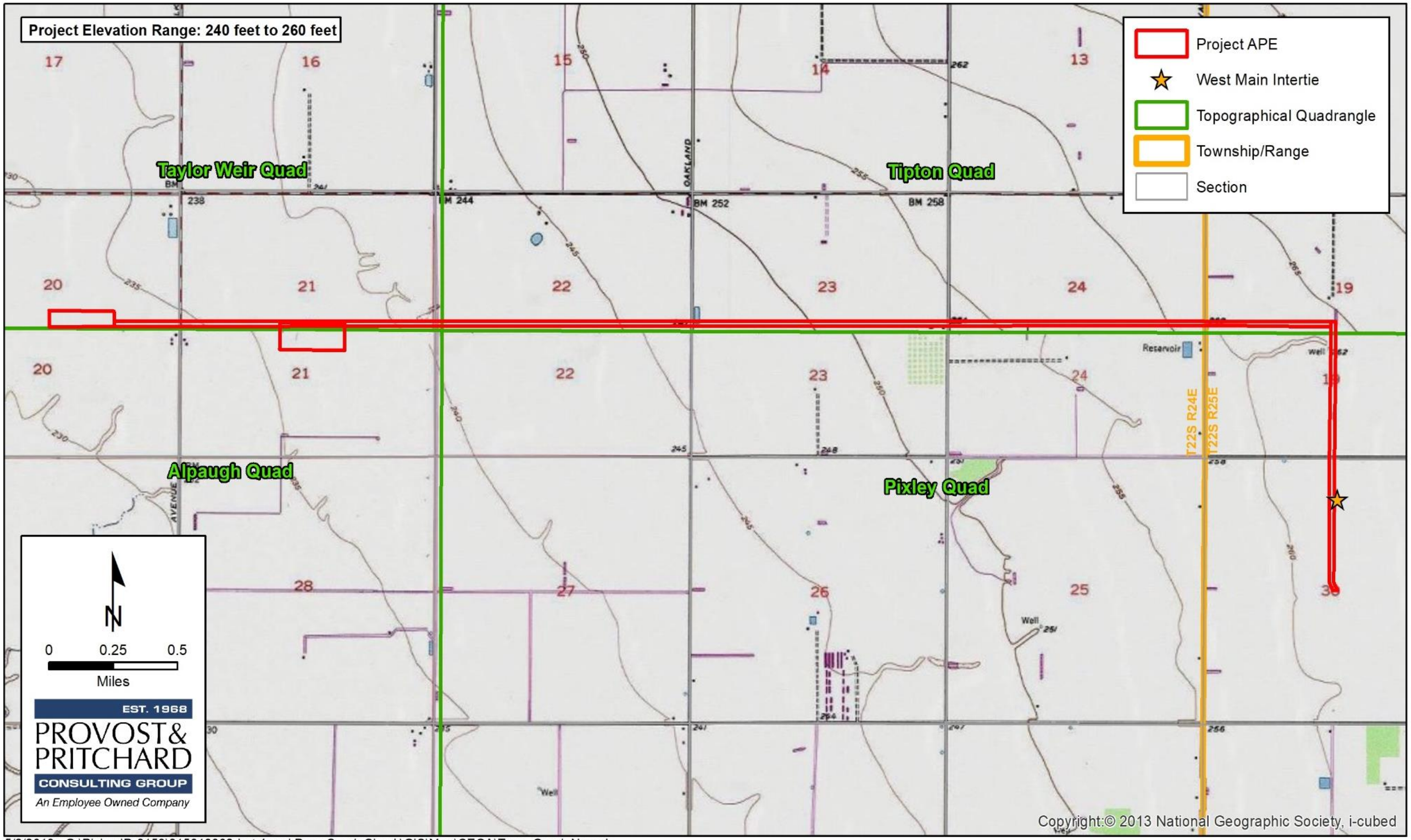

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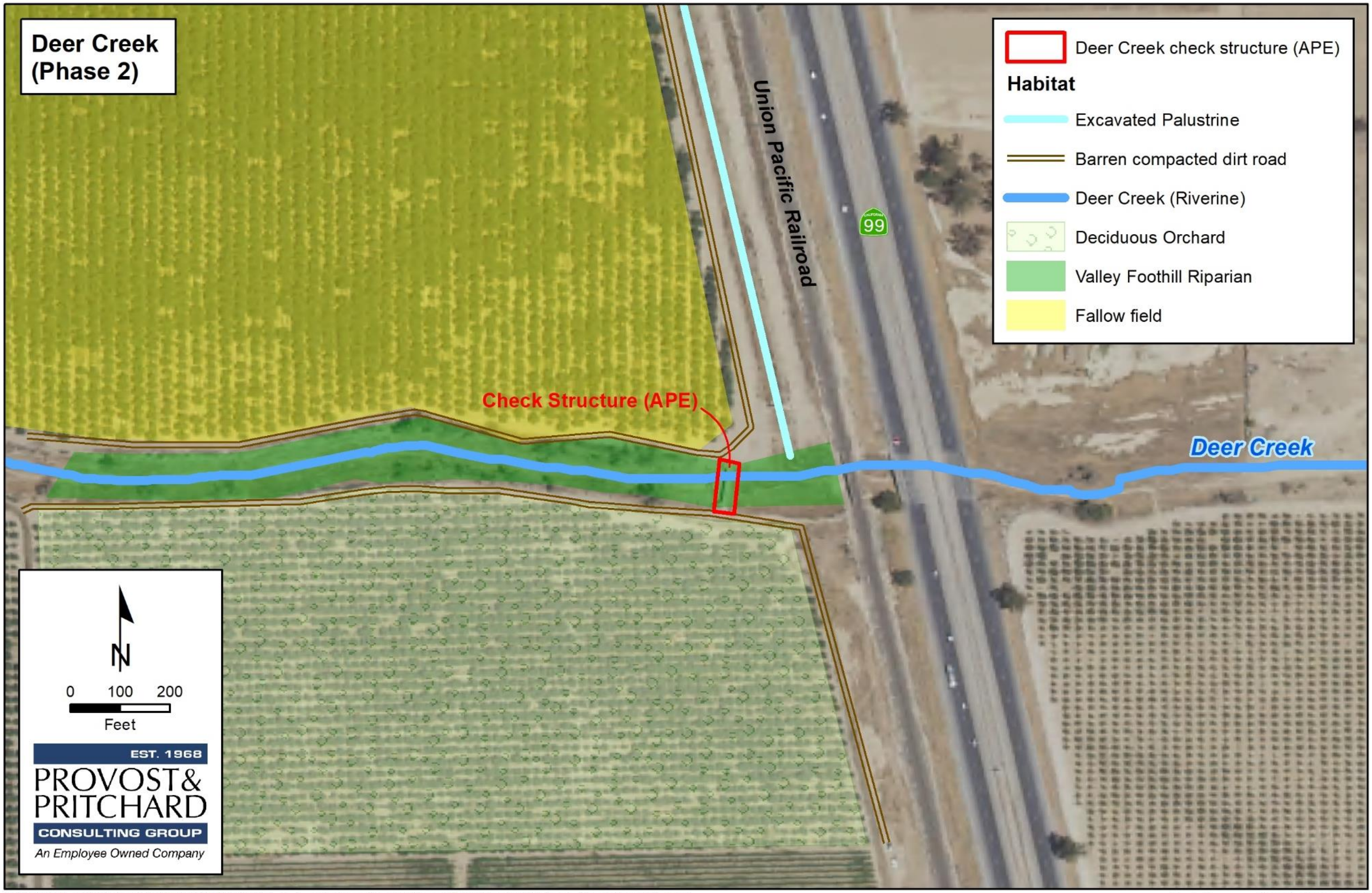
Figure 4. Topographic Quadrangle Map of Lateral 4 Canal Alignment Project Area



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Aerial Image: USDA NAIP 2016

Figure 5. Deer Creek Check Structure Project Area Map/ Area of Potential Effect (APE)

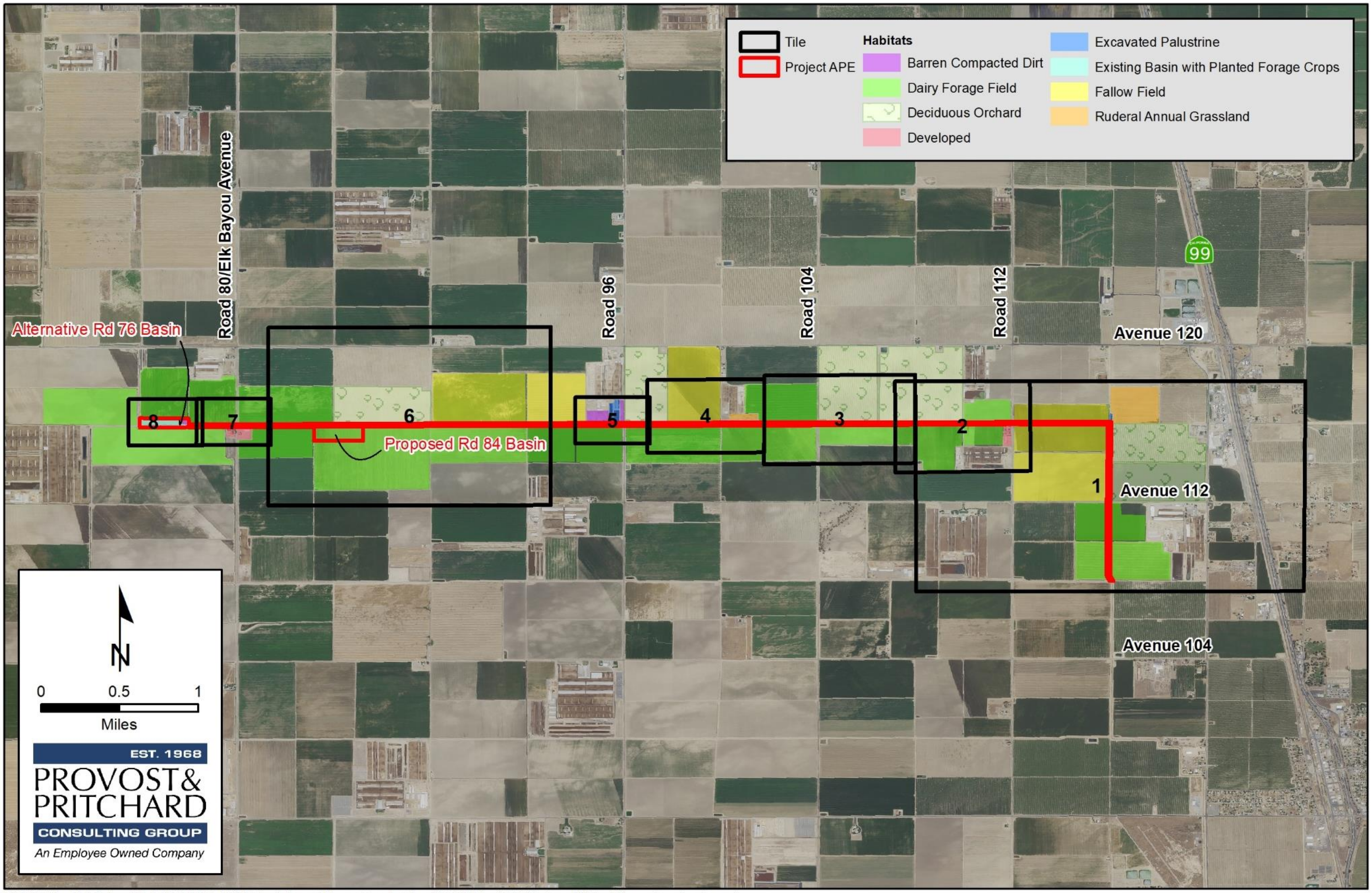

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Figure 6. Overview of Lateral 4 Canal Alignment Project Area Map/ APE

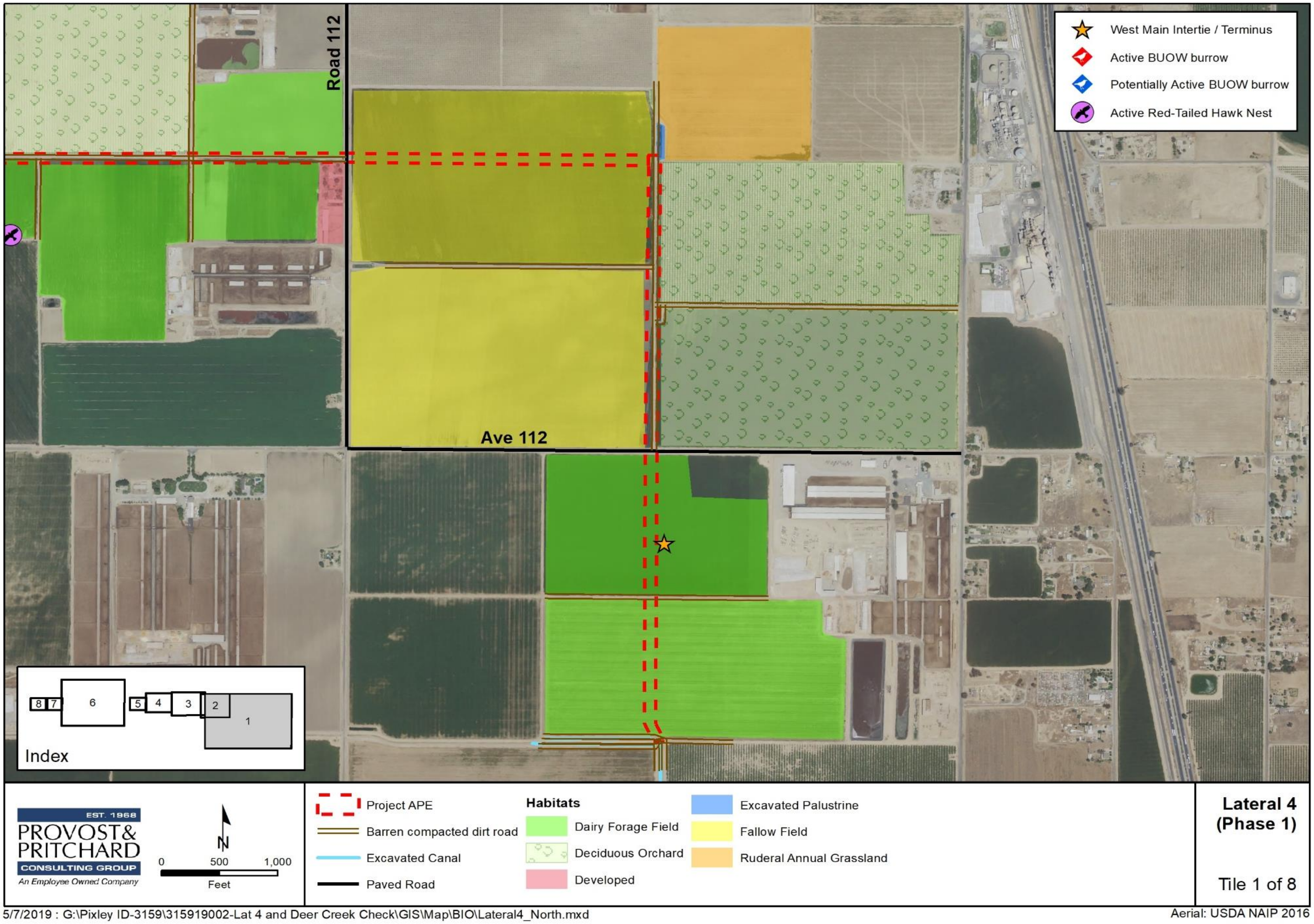

Figure 7. Southeast Terminus of Lateral 4 Canal Alignment.

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Aerial: USDA NAIP 2016

Figure 8. Lateral 4 Alignment

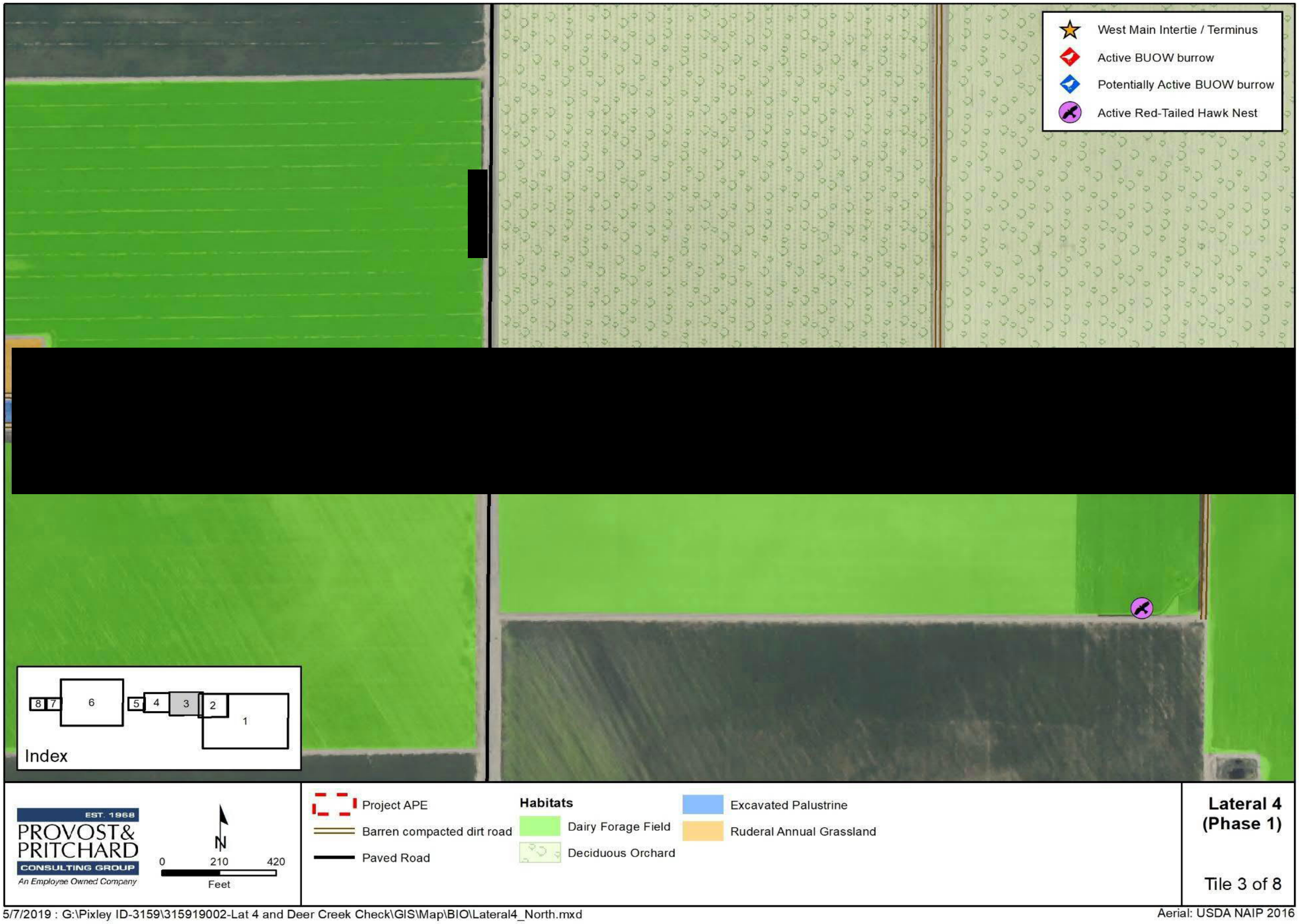
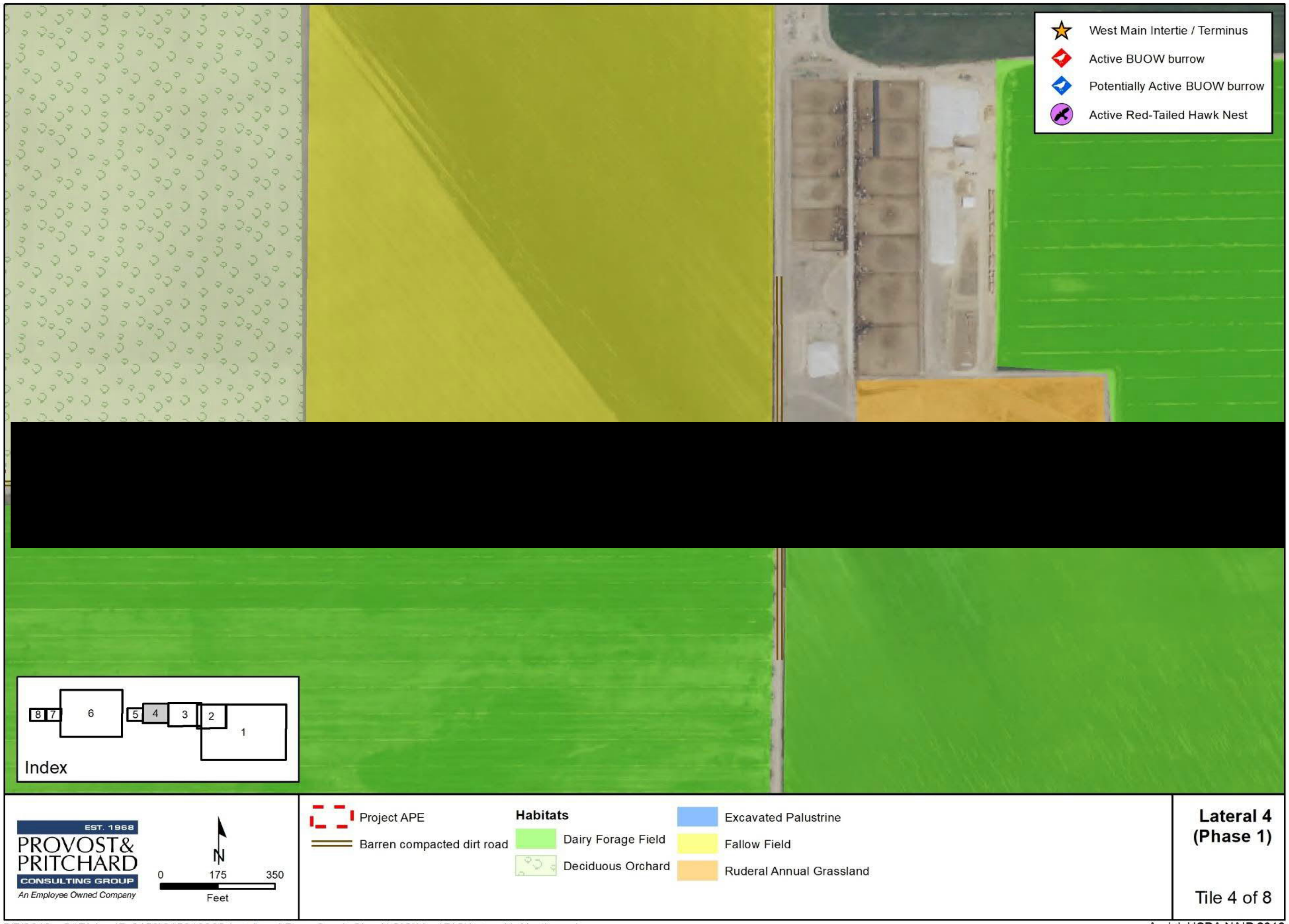


Figure 9. Lateral 4 Alignment



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Aerial: USDA NAIP 2016

Figure 10. Lateral 4 Alignment

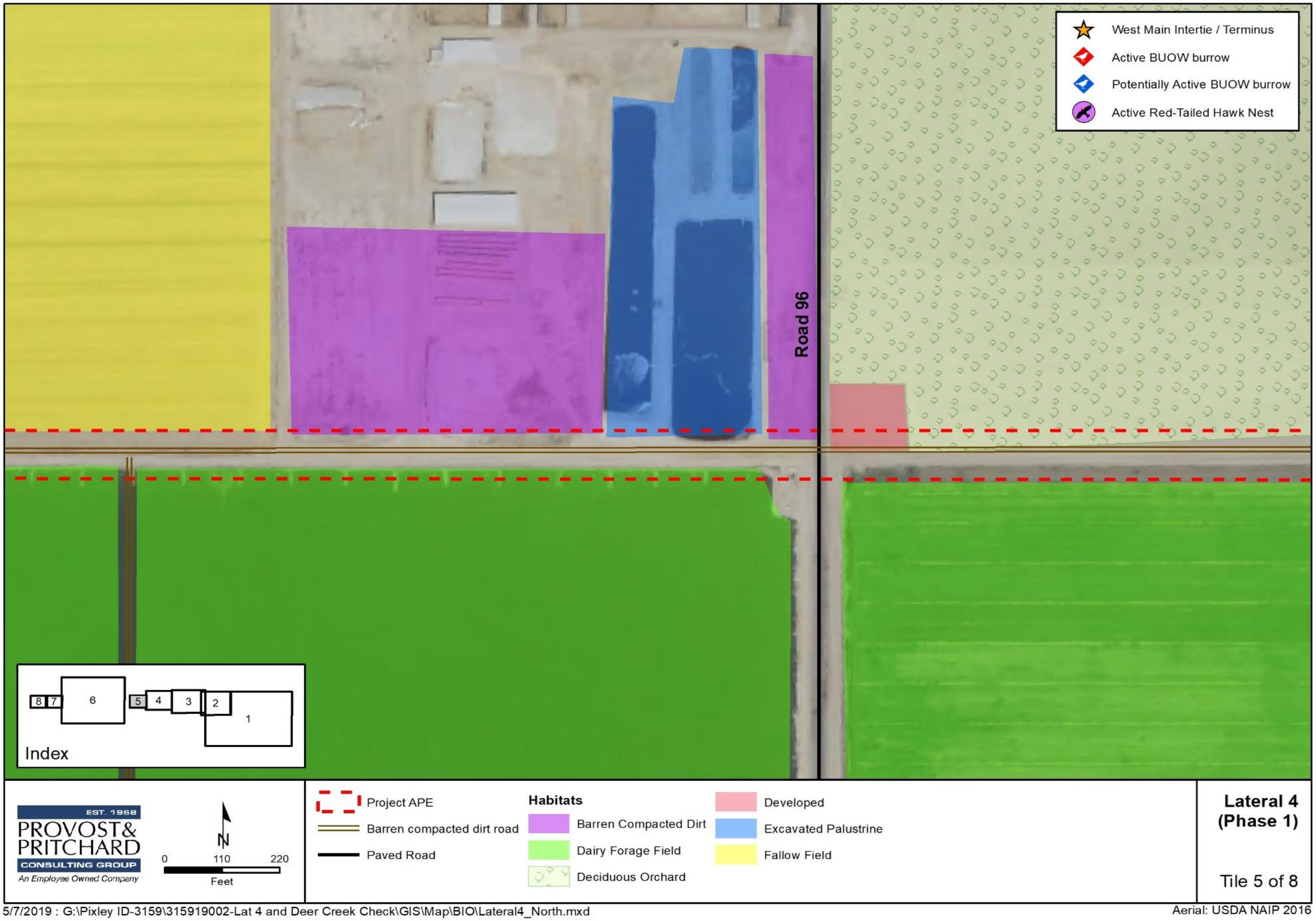

Figure 11. Lateral 4 Alignment

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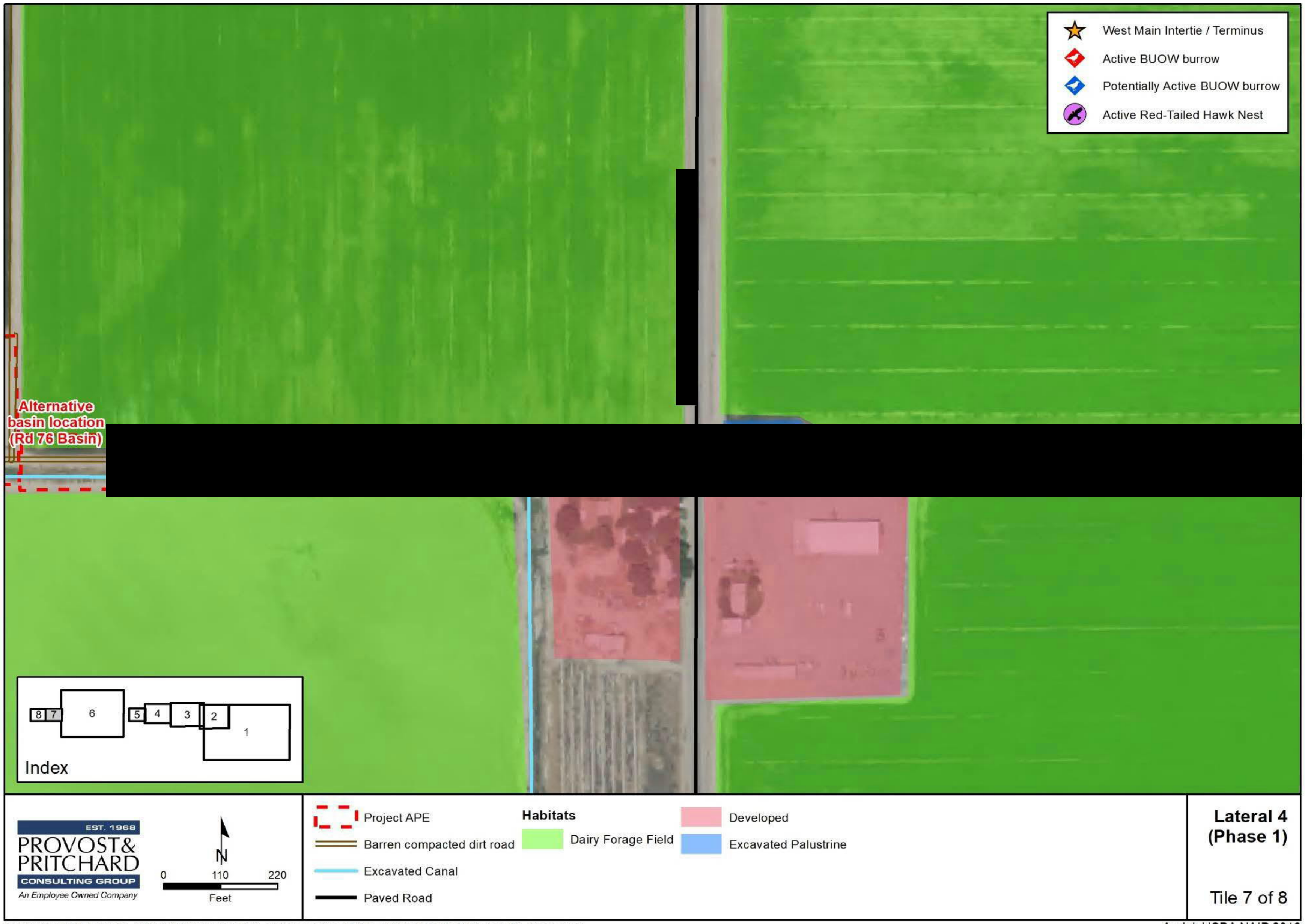
Figure 12. Lateral 4 Alignment



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Aerial: USDA NAIP 2016

Figure 13. Lateral 4 Alignment

Figure 14. Lateral 4 Alignment

2 Existing Conditions

2.1 Regional Setting

The Project site is located in Tulare County within the lower San Joaquin Valley, part of the Great Valley of California (See **Figure 1**). The Valley is bordered by the Sierra Nevada Mountain Ranges to the east, the Coast Ranges to the west, the Klamath Mountains and Cascade Range to the north, and the Transverse Ranges and Mojave Desert to the south.

Like most of California, the San Joaquin Valley experiences a Mediterranean climate. Warm, dry summers are followed by cool, moist winters. Summer temperatures often reach above 90 degrees Fahrenheit, and the humidity is generally low. Winter temperatures are often below 60 degrees Fahrenheit during the day and rarely exceed 70 degrees. On average, the Central Valley receives approximately 12 inches of precipitation in the form of rainfall yearly, most of which occurs between October and March.

The Deer Creek check structure is located along Deer Creek, just west of State Route 99, within the Town of Ducor-Deer Creek watershed; Hydrologic Unit Code (HUC): 180300050902. The proposed alignment for the Lateral 4 surface water delivery system lies approximately 6 miles north, within the Old Deer Creek Channel-Deer Creek watershed; HUC: 180300050904 and potentially extends westward into the Lamberson Ditch-Frontal Tulare Lake Bed watershed; HUC: 180300122102, if the District constructs the terminus basin at Road 76 (EPA, 2019).

The Project lies entirely within the Tule Groundwater Subbasin of the San Joaquin Valley Groundwater Basin (DWR, 2019). Principal drainages in the vicinity are Deer Creek, which intersects the Deer Creek check structure, and is located approximately 5.5 miles south of the proposed Lateral 4 alignment; and the Tule River, approximately 6.5 miles north of the proposed Lateral 4 alignment. Water features along the alignment consist of various man-made canals, irrigation ditches, basins, and dairy lagoons.

The Project is located in Tulare County, west of State Route 99 in an area dominated by agricultural production and dairy industry. Project areas are predominantly surrounded by agricultural lands, fallow fields, ruderal compacted dirt access roads, weedy ruderal lots, various excavated canals, basins, dairy lagoons and associated infrastructure, and scattered rural residences.

Photographs of the Project areas and vicinity are available in **Appendix A** at the end of this document.

2.2 Project Site

2.2.1 Deer Creek Project Area

The Deer Creek check structure is located over Deer Creek, just west of the Union Pacific Railroad and State Route 99, as illustrated in **Figure 5**. The channel of Deer Creek consists of riverine habitat and a corridor of valley foothill riparian habitat is present immediately along each bank. Riparian vegetation extends out to the barren compacted dirt road at top of bank on each side. Fallow field is present beyond the dirt road on the north side of the creek, and a productive orchard is present beyond the dirt road on the south side. All portions of the Deer Creek project area appear to be highly disturbed by human activities, and most of the vegetation observed was weedy and invasive. Large chunks of rip-rap line the banks east of the check structure. Scattered refuse and piles of debris are present along top of bank and throughout surveyed areas.

2.2.2 Lateral 4 Alignment

The proposed Lateral 4 canal alignment lies approximately 5.5 miles north of the Deer Creek check structure. The alignment would begin at the existing West Main canal, and run north for one mile before traveling west for approximately 4 or 5 miles, depending on which basin alternative is used. The first stretch of the alignment that travels north-south would intersect two dairy-forage fields (a distance of approximately 0.5 miles) and 0.5 miles of barren compacted dirt road. As the alignment changes direction and travels west, it intersects one fallow field (a distance of approximately 0.5 miles) and the remainder of the alignment would be constructed within barren compacted dirt road. If the Road 84 Basin is constructed, impacts would also include a portion of a dairy-forage field. If the alternative basin location is chosen, additional impacts would include an existing basin with planted dairy-forage crops. Surrounding uses and habitats are illustrated in Figure 6, which provides an overall view of the Lateral 4 alignment, and in **Figure 7 through Figure 13**, which provides a closer view of each section of the proposed alignment from east to west.

2.3 Biological Communities

Eight biological communities were identified within and adjacent to the Project areas: 1) hayfield (dairy-forage field), 2) deciduous orchard, 3) fallow field, 4) ruderal-annual grassland, 5) barren (compacted dirt), 6) developed, 7) riverine, 8) valley foothill riparian, and 9) excavated palustrine (basins, ditches, and dairy lagoons).

2.3.1 Hayfield (Dairy-Forage Field)

The proposed Lateral 4 alignment cuts through two dairy-forage fields north of the West Main Canal, and construction activities may indirectly and/or temporarily impact additional adjacent dairy-forage fields along the east-west portion of the alignment. Dairy-forage fields include various hayfield crops of alfalfa, triticale, wheat, barley, and oats, which are harvested and used primarily as cattle feed for the numerous dairies in the vicinity.

At the time of the field survey, several large colonies of native red-winged blackbirds (*Agelaius phoeniceus*) were observed within the abundant dairy forage fields. Although none were observed during the survey, the red-winged blackbird's close relative, the tricolored blackbird (*Agelaius tricolor*) is known to frequently use these forage fields for nesting and foraging, as well. In California, the tri-colored blackbird is a candidate for endangered status and a species of special concern due to loss of habitat and a significant decline in population. See **Section 3.3.2** for an expanded discussion regarding tricolored blackbird.

A few mammal species may also occur within the dairy forage fields. Small mammals such as common lagamorphs *(Lepus californicus* and *Sylvilagus audubonii)*, deer mice (*Peromyscus maniculatus*), California voles (*Microtus californicus*), Botta's pocket gophers (*Thomomys bottae*), and California ground squirrels (*Otospermophilus beecheyi*) would likely occur, but the population would depend heavily on irrigation practices, harvesting schedules, the presence or absence of rodenticides or other ag pest-control techniques, and the prevalence of predators.

Reptiles and amphibians, such as San Joaquin fence lizard (*Sceloporus occidentalis biseriatus*), California toad (*Anaxyrus boreas halophilus*), western side-blotched lizard (*Uta stansburiana elegans*), Sierran treefrog (*Pseudacris sierra*), Pacific gophersnake (*Pituophis catenifer catenifer*), California kingsnake (*Lampropeltis californiae*) and valley garter snake (*Thamnophis sirtalis fitchi*) likely occur within irrigated and non-irrigated forage crops.

The presence of amphibians, reptiles, birds, small mammals, and arthropods is likely to attract foraging raptors and mammalian predators. Mammalian predators in the Project area are likely limited to domestic dogs and cats and wildlife species relatively tolerant of disturbance, such as raccoons (*Procyon lotor*), coyotes (*Canis latrans*), striped skunks (*Mephitis mephitis*), and gray foxes (*Urocyon cinereoargenteus*). Various species of bat may also forage for flying arthropods over field crops. Raptors, such as red-tailed hawks (*Buteo jamaicensis*), barn owls (*Tyto alba*), or American kestrels (*Falco sparverius*) may forage over these fields in the vicinity of the Project. At the time of the field survey, an active red-tailed hawk nest was observed within the canopy of a singular large deciduous tree growing out of a forage field. An adult red-tailed hawk was observed in incubation posture and exhibiting defensive behavior. The location of the nest is illustrated above, in **Figure 8**, and in Photograph 20 within **Appendix A**, at the end of this document.

Several of the dairy-forage fields contained ephemeral and/or seasonal pools of standing water, likely due to irrigation practices and poorly draining soil or altered ground conditions. Many of the pools contained mosquito larvae, *Daphnia sp*., and algae. No tadpoles, fairy shrimp, or special status vernal pool branchiopods were observed. These pools could be considered breeding habitat for regionally common amphibians or foraging habitat for waterfowl, shorebirds, or waders, such as the great egret (*Ardea alba*), great blue heron (*Ardea herodius*), American bittern (*Botaurus lentiginosus*), killdeer (*Charadrius vociferous*), black-necked stilt (*Himantopus mexicanus*), whimbrel (*Numenius phaeopus*), cinnamon teal (*Anas cyanoptera*) or mallard (*Anas platyrhynchos*). Many of the aforementioned avian species were observed during the biological survey, although not within the dairy-forage fields. The presence of standing water within the forage fields may also attract opossums (*Didelphis virginiana)* or raccoons *(Procyon lotor).*

2.3.2 Deciduous Orchard

Orchards are composed of single-species trees planted in rows. As illustrated in **Figure 5 through Figure 14**, several deciduous orchards are present along the proposed alignment of the Lateral 4 canal. At the time of the field survey, trees had been freshly-pruned and the well-manicured understory was comprised of moist soil, completely lacking any grasses or herbaceous vegetation. Pooling was present at the base of several rows of trees from recent precipitation events and ongoing flood irrigation practices. Intensive agricultural practices in the orchards likely limit their value to wildlife; however, some avian and mammalian species have adapted to vineyard habitats. For example, mourning doves (*Zenaida macroura*), American robins (*Turdus migratorius*), killdeer (*Charadrius vociferous*), invasive European starlings (*Sturnus vulgaris*), house finches (*Haemorhous mexicanus*), yellow-rumped warblers (*Setophaga coronata*), and black phoebes (*Sayornis nigricans*) are all known to frequent orchard and vineyard habitats in the Central Valley, some for nesting and others for foraging. Common lagamorphs (*Lepus californicus* and *Sylvilagus audubonii*), Botta's pocket gophers (*Thomomys bottae*), and California ground squirrels (*Otospermophilus beecheyi*) are often considered "agricultural pests" due to their prevalence in orchard and vineyard habitats.

While rodent burrows were not observed within the orchards surveyed, there was evidence of extensive burrowing within berms, basins, ditches, and ruderal or barren areas adjacent to orchard and other prime foraging habitat. Use of flood irrigation practices, rodenticides and other ag pest-control techniques, and frequent disturbance makes orchard habitat of generally low quality for habitation by burrowing mammals; however, these species may use these sites as foraging habitat. Several disturbance-tolerant avian species may nest within the trees during breeding season. Although no active nests were observed within orchard habitat, the following native species were observed foraging and/or exhibiting nest-building behavior within the orchards surveyed: American robin (*Turdus migratorius*), California scrub jay (*Aphelocoma californica*), mourning dove (*Zenaida macroura*), and house sparrow (*Passer domesticus).* A pair of great egrets (*Ardea alba)* were observed foraging on oligochaetes within a standing pool of water, resultant from flood irrigation, within one of the deciduous orchards.

Native amphibians with the potential to use orchards of the surrounding sites include the native Sierran treefrog (*Pseudacris sierra*) and the native California toad (*Anaxyrus boreas halophilus*), both of which may breed in seasonal irrigation basins or nearby canals and subsequently disperse through the farmlands. It is not uncommon to find these species far from water outside of breeding season.

Additional wildlife expected to occur within orchard communities include San Joaquin fence lizard (*Sceloporus occidentalis biseriatus*), western side-blotched lizard (*Uta stansburiana elegans*), Pacific gophersnake (*Pituophis catenifer catenifer*), California kingsnake (*Lampropeltis californiae*), valley garter snake (*Thamnophis sirtalis fitchi*), raccoons (*Procyon lotor*), coyotes (*Canis latrans*), striped skunks (*Mephitis mephitis*), and gray foxes (*Urocyon *cinereoargenteus*). Raptors and various species of bats, such as those species mentioned above in **Section 2.3.1** may also forage over the orchard habitat within Project areas.

2.3.3 Fallow Field

A fallow field is a section of land that has been used for agriculture, but is left uncultivated for a period of time in order to restore productivity of the soil. Fallow field can be plowed, tilled, or disced on a regular basis, resulting in barren ground with loose, friable soils or it can be left untouched, resulting in an abundance of weedy invasive vegetation. For the purposes of this report, fallow field will be defined as agricultural fields with signs of regular ground-disturbance and lacking in vegetative cover, as illustrated in Photograph 17 in **Appendix A** at the end of this document. Ruderal fields overgrown with weedy, invasive vegetation and barren habitats with substrate of compacted dirt will be discussed separately in **Section 2.3.4** and **Section 2.3.5**, respectively, below.

Recently disced fallow field was present north of Deer Creek and along the proposed Lateral 4 alignment, as illustrated in **Figure 5** through **Figure 14**. These fallow fields contained distinct rows of loose soils and vegetation was absent or scarce. Burrowing mammals are often attracted to fallow fields for their friable soils, and raptors and mammalian predators are subsequently attracted by the resultant population of burrowing rodents as a prey source. Ground squirrel burrows were often abundant along the margins of the fallow fields and murid rodent burrows and sign were evident within the fields. Frequent disturbance and lack of vegetative cover makes this habitat generally unsuitable for most species. However, the following species would be expected to occur: common lagamorphs (*Lepus californicus* and *Sylvilagus audubonii*), Botta's pocket gophers (*Thomomys bottae*), California ground squirrels (*Otospermophilus beecheyi*), deer mice (*Peromyscus maniculatus*), California voles (*Microtus californicus*), San Joaquin fence lizard (*Sceloporus occidentalis biseriatus*), western side-blotched lizard (*Uta stansburiana elegans*), Pacific gophersnake (*Pituophis catenifer catenifer).* Raptors and various bat species, such as those listed in **Section 2.3.1** may forage over the site. Burrowing owls (*Athene cunicularia*) may find suitable nesting habitat in ground squirrel burrows within or adjacent to fallow fields, and killdeer (*Charadrius vociferous*) may nest on the bare ground. Raccoons (*Procyon lotor*), coyotes (*Canis latrans*), striped skunks (*Mephitis mephitis*), gray foxes (*Urocyon cinereoargenteus*), and opossums (*Didelphis virginiana)* may pass through or use fallow fields for foraging.

2.3.4 Ruderal-Annual Grassland

Ruderal habitats are characterized by a high level of human disturbance and absence of vegetation or dominated by non-native plant species. For the purposes of this report, barren ruderal lands and densely-vegetated, weedy, ruderal lands will be discussed separately in order to adequately analyze the value of each habitat for various wildlife species.

Areas classified as ruderal-annual grassland on **Figure 5** through **Figure 14** include patches of land where the original topography and vegetation composition have been modified by recurrent use of heavy machinery. These lands have been graded, tilled, disced, and subject to years of ground-disturbance. Native vegetation is essentially absent with the exception of scattered fiddleneck (*Amsinckia menziesii*); invasive weedy vegetation (*Brassica nigra, Brassica rapa*, *Capsella bursa-pastoris*, *Bromus diandrus*, *Bromus madritensis*, *Hordeum murinum*, and *Malva parviflora*) provides near 100% cover. Soils are friable and contained an abundance of rodent burrows of various sizes at the time of the field survey. Although ruderal, these annual grasslands provide refuge and foraging habitat for a variety of wildlife species.

Ruderal-annual grassland was observed in two locations adjacent to the proposed Lateral 4 alignment. In both areas, the grassland was adjacent to an excavated basin with banks that were riddled with erosion ruts and large ground squirrel burrows. The large burrows along the banks provide suitable nesting habitat for burrowing owl (*Athene cunicularia*) and the grassland, although ruderal, provides suitable foraging habitat. [redacted] While the burrows [redacted] appeared to be suitable for burrowing owls at first glance, these burrows showed no signs of recent occupation, likely due to the presence of large walnut trees in the vicinity which could serve as a perch for predators.

Ruderal-annual grassland in the vicinity of the Project could conceivably contain a rare plant species, although none were observed during the field survey. Occurrence of a rare plant would be unlikely, and a population would not be expected to persist due to competing invasive species and frequent disturbance associated with discing for weed abatement and fire prevention at least twice per year.

Given the abundance of burrows of various sizes within and adjacent to ruderal-annual grassland in the Project's vicinity, the following species are expected within this habitat: common lagamorphs (*Lepus californicus* and *Sylvilagus audubonii*), Botta's pocket gophers (*Thomomys bottae*), California ground squirrels (*Otospermophilus beecheyi*), deer mice (*Peromyscus maniculatus*), and California voles (*Microtus californicus*). Several of the burrows observed were large enough to house a gray fox (*Urocyon cinereoargenteus*) or a striped skunk (*Mephitis mephitis*), although striped skunks usually prefer to den within two miles of fresh water. A San Joaquin kit fox could conceivably inhabit one of these large burrows; however, regional occurrences of this species is relatively uncommon. Furthermore, frequent disturbance, fragmentation of the surrounding lands, and the site's proximity to State Route 99 and Union Pacific Railroad would likely impede dispersal movements. In addition, an American badger (*Taxidea taxus*) could inhabit a large burrow within the ruderal-annual grassland. However, no signs indicative of an active badger den (claw marks, prey remnants, tracks, scat) were observed during the survey, and occurrence of this species, while possible, would be relatively unlikely for the same reasons a kit fox would be deterred from the area.

Additional wildlife expected to occur within ruderal-annual grassland communities include San Joaquin fence lizard (*Sceloporus occidentalis biseriatus*), western side-blotched lizard (*Uta stansburiana elegans*), Pacific gophersnake (*Pituophis catenifer catenifer*), California kingsnake (*Lampropeltis californiae*), raccoons (*Procyon lotor*), coyotes (*Canis latrans*), and striped skunks (*Mephitis mephitis*). Raptors and various species of bats, such as those species mentioned above in Section 2.3.1 may also forage over the ruderal-annual grassland habitat within Project areas.

Fortunately, the Project does not propose direct impacts to any of the ruderal-annual grassland communities in the area. Impacts will occur along the barren compacted dirt road and are not expected to encroach into the adjacent habitats.

2.3.5 Barren (Compacted Dirt)

As illustrated on **Figure 6** through **Figure 14**, the majority of the proposed Lateral 4 alignment follows barren, compacted dirt road, currently used for activities related to agricultural production. Barren, compacted dirt generally provides little-to-no habitat or foraging value to wildlife. Frequent vehicle traffic along these agricultural access roads makes these areas unsuitable for wildlife. However, since all other habitats in Project areas are bisected by barren dirt roads, some wildlife species undoubtedly occur within, or at least pass through, these areas.

Reptiles, such as San Joaquin fence lizard (*Sceloporus occidentalis biseriatus*), western side-blotched lizard (*Uta stansburiana elegans*), Pacific gophersnake (*Pituophis catenifer catenifer*), California kingsnake (*Lampropeltis californiae*) and valley garter snake (*Thamnophis sirtalis fitchi*) may seek refuge in adjacent fields and emerge to bask along the dirt roads. Killdeer (*Charadrius vociferous*) are notorious for nesting on bare ground of compacted dirt agricultural access roads. Common lagamorphs (*Lepus californicus* and *Sylvilagus audubonii*), striped skunks (*Mephitis mephitis*), and opossums (*Didelphis virginiana)* are expected to traverse these roads while foraging or seeking shelter, and they often fall victim to vehicle strikes.

Many of the barren, compacted dirt areas consisted of dirt roads which contained an abundance of burrows along the margins. These burrows are likely of ground squirrel origin, although they could potentially be inhabited by a number of different species, including burrowing owl (*Athene cunicularia*), various species of fox, and striped skunk (*Mephitis mephitis*). Some of the burrows, especially those within erosion ruts, were large enough to house an American badger (*Taxidea taxus*) or a coyote (*Canis latrans*).

Barren banks of canals, ditches, and dairy lagoons containing an abundance of burrows were present throughout surveyed areas along the proposed Lateral 4 alignment. However, these will be discussed separately under **Section 2.3.9**, Excavated Palustrine.

2.3.6 Developed

Urban development along the proposed Lateral 4 alignment included paved roads, rural residences, dairies, farms, wells, and associated irrigation infrastructure. Many of the residences consisted of paved or gravel driveways, and landscaped yards with well-manicured lawns, flower beds, and ornamental trees and shrubs.

Developed lands of the Project area represent low-quality habitat for the majority of wildlife species. However, trees and shrubs present within landscaped areas may provide nesting habitat for disturbance-tolerant species such as the northern mockingbird (*Mimus polyglottos*), mourning dove (*Zenaida macroura*), western scrub jay (*Aphelocoma californica*), or American robin (*Turdus migratorius*). Similarly, disturbance-tolerant cavity-nesting birds such as invasive European starlings (*Sturnus vulgaris*) and house sparrows (*Passer domesticus*), or birds known to nest on structures such as the house finch (*Haemorhous mexicanus*) and black phoebe (*Sayornis nigricans*) may find suitable nesting habitat within developed areas.

A few mammals may also occur within development in the Project vicinity. Although none of the structures within the Project area contained projections, crevices, or potential roosts large enough to house a western mastiff bat (*Eumops perotis*), a variety of smaller native bat species, such as the special status pallid bat (*Antrozous pallidus*) could potentially roost within the present trees and structures. However, no bat individuals or bat sign was observed during the biological survey and frequent human disturbance makes the possibility of roosting bats relatively unlikely in the developed areas of the Project. Small mammals such as deer mice (*Peromyscus maniculatus*), California voles (*Microtus californicus*), Botta's pocket gophers (*Thomomys bottae*), and California ground squirrels (*Otospermophilus beecheyi*) could burrow in unpaved surfaces in the Project vicinity. Feral and domestic cats and dogs were present throughout the surveyed areas. Although not observed, Raccoons (*Procyon lotor*), Coyotes (*Canis latrans*), striped skunks (*Mephitis mephitis*), gray foxes (*Urocyon cinereoargenteus*) and non-native opossums (*Didelphis virginiana*), are all known to frequent developed and ruderal habitats and would be expected to regularly occur within the Project area.

Reptiles and amphibians such as the San Joaquin fence lizard (*Sceloporus occidentalis biseriatus*), California toad (*Anaxyrus boreas halophilus*), western side-blotched lizard (*Uta stansburiana elegans*), Sierran treefrog (*Pseudacris sierra*), and the invasive American bullfrog (*Lithobates catesbeianus*) likely occur in the vicinity of the Project. In the winter and spring, the aforementioned amphibian species may breed in small ponding basins or irrigation basins in the vicinity of the Project. Pacific gophersnake (*Pituophis catenifer catenifer*), valley garter snake (*Thamnophis sirtalis fitchi*), and California kingsnake (*Lampropeltis californiae*) may occasionally pass through developed lands in the Project area.

2.3.7 Riverine

Riverine habitat is present within the channel of Deer Creek at the location of the Deer Creek check structure. The banks near the check structure contain a significant quantity of rip-rap. Vegetation along the banks and within the ordinary high water mark is discussed below in **Section 2.3.8**.

Deer Creek is an intermittent stream which commences in the Greenhorn Mountains of the Sierra Nevada Range. Historically, Deer Creek was a tributary to the dry Tulare Lake endothermic basin, but now it terminates in the Lakeland and Homeland Canals near the Tulare-Kings County border, and most water is diverted for irrigation of agricultural crops. Channels are commonly dry throughout late summer through spring. Riverine habitat often occurs in association with a variety of terrestrial habitats, such as riparian habitat which often abuts rivers and streams.

Riverine communities provide food, shelter, and spawning and rearing habitat for a variety of fishes such as native minnows and introduced warmwater game species. Although no aquatic species were observed during the biological survey, common native fish species with potential to occur in Deer Creek include coastal rainbow trout (*Oncorhynchus mykiss irideus*), Sacramento blackfish (*Orthodon microlepidotus*), and Sacramento sucker (*Catostomus occidentalis occidentalis*); common invasive species include common carp (*Cyprinus carpio*), white catfish (*Ameiurus catus*), and channel catfish (*Ictalurus punctatus*).

Riverine communities and adjacent riparian vegetation typically provide suitable nesting habitat for waterfowl, migratory birds, and shorebirds. Some common avian species expected to occur within riverine habitat include great blue heron (*Ardea herodias*), American bittern (*Botaurus lentiginosus*), and great egret (*Ardea alba*). Although signs of habitation were absent at the time of the field survey, the adjacent bridge over Deer Creek provides suitable nesting habitat for a colony of swallows.

At the time of the field survey, significant flow was present within the channel of Deer Creek. During most of the dry season, standing pools of water are likely present within the channel, which would provide suitable breeding habitat for a variety of amphibian species, such as the non-native American bullfrog (*Lithobates catesbeianus*), native California toad (*Anaxyrus boreas halophilus*), or the native Sierran treefrog *(Pseudacris sierra).*

Many of the animal species occurring within adjacent communities would also be expected to use the aquatic habitat to drink water or forage on other aquatic species. The following mammals are relatively tolerant of human disturbance and are likely to pass through the riverine habitat of the Project site: coyote (*Canis latrans*), opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), California ground squirrel (*Otospermophilus beecheyi*), and gray fox (*Urocyon cinereoargenteus).*

None of the structures within Deer Creek contained projections, crevices, or potential roosts large enough to house a western mastiff bat (*Eumops perotis*), but a variety of smaller native bat species, such as the special status pallid bat (*Antrozous pallidus*) could potentially roost within trees or the bridge east of the Deer Creek check structure. However, no bat individuals or bat sign was observed during the biological survey and frequent human disturbance makes the possibility of roosting bats relatively unlikely.

2.3.8 Valley Foothill Riparian

Although frequent disturbance was evident, valley foothill riparian habitat was present along Deer Creek from the ordinary high water mark to the top of bank. Native Fremont cottonwoods (*Populus fremontii*) and *Salix ssp*. line the top of bank. The understory along both banks is comprised of shrubby *Salix ssp.,* native fiddleneck *(Amsinckia menziesii),* invasive mustard *(Brassica nigra, Brassica rapa)*, invasive grasses (*Bromus diandrus*, *Bromus madritensis*, *Hordeum murinum, Arundo donax),* invasive cheeseweed *(Malva parviflora),* invasive curly dock (*Rumex crispus*), invasive sheep sorrel (*Rumex acetosella*), native bedstraw (*Galium aparine*), native cocklebur (*Xanthium strumarium*), native California mugwort (*Artemisia douglasiana*), native miner's lettuce (*Claytonia perfoliata*), non-native chickweed (*Stellaria media*), invasive California burclover (*Medicago polymorpha*), non-native big heron bill (*Erodium botrys),* invasive poison hemlock *(Conium maculatum),* native hemlock water parsnip *(Sium suave),* and non-native horse nettle *(Solanum elaeagnifolium).*

Riparian habitats typically provide valuable habitat for a variety of animal species in the form of abundant vegetation that can be used for food and/or cover. Amphibians may breed in shallow pools of standing water within the riverbed and disperse to the adjacent riparian habitat. Amphibians likely to occur in this habitat include the non-native American bullfrog (*Lithobates catesbeianus*), native California toad (*Anaxyrus boreas halophilus*), or the native Sierran treefrog *(Pseudacris sierra)*. Some reptile species with potential to occur in this habitat include the native California whiptail (*Aspidoscelis tigris munda*), native western fence lizard (*Sceloporus occidentalis biseriatus*), native valley gartersnake (*Thamnophis sirtalis fitchi*), native western yellow-bellied racer (*Coluber constrictor mormon*), and the native Sierra alligator lizard (*Elgaria coerulea palmeri*).

Some mammals that may seek cover in riparian vegetation or burrow along the banks of Deer Creek include the following native species: Audubon's cottontail (*Sylvilagus audobonii*), opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), California ground squirrel (*Otospermophilus beecheyi*), and gray fox (*Urocyon cinereoargenteus*). Many of the animal species occurring within adjacent communities would also be expected to pass through the riparian corridor in seek of water or foraging grounds in the river. A variety of bat species could be attracted by the presence of water and flying insects.

Ground-nesting birds may build nests within the tall grass or shrubs, and cavity-nesting birds may seek refuge in cavities observed in the cottonwoods lining the banks of Deer Creek. The sturdy cottonwood canopies could support a large stick nest suitable for a variety of native raptor species. Riparian songbirds may nest within the cottonwoods, or the smaller trees and shrubs. At the time of the field survey, colonies of invasive European starlings (*Sturnus vulgaris*) were present, and the following native avian species were observed: cliff swallow (*Petrochelidon fulva*), black phoebe (*Sayornis nigricans*), house wren (*Troglodytes aedon*), acorn woodpecker (*Melanerpes formicivorus*), red-tailed hawk (*Buteo jamaicensis*), California scrub jay (*Aphelocoma californica*), northern mockingbird (*Mimus polygottos*), American crow (*Corvus brachyrhynchos*), mourning dove (*Zenaida macroura*) and house sparrow (*Passer domesticus*). Some additional native species not observed, but expected to occur within this habitat include the western meadowlark (*Sturnella neglecta*), mallard (*Anas platyrhynchos*), dark-eyed junco (*Junco hyemalis*), California quail (*Callipepla californica*), red-shouldered hawk (*Buteo lineatus*), great egret (*Ardea alba*), American robin (*Turdus migratorius*), Bullock's oriole (*Icterus bullockii*), song sparrow (*Melospiza melodia*), Bewick's wren (*Thryomanes bewickii*), barn owl (*Tyto alba*), great horned owl (*Bubo virginianus*), and American kestrel (*Falco sparverius*).

2.3.9 Excavated Palustrine (Basins, Ditches, and Dairy Lagoons)

For the purposes of this report, all man-made, excavated basins, irrigation canals, ditches, dairy lagoons, and settling ponds will be referred to as excavated palustrine. Palustrine systems include non-tidal wetlands dominated by trees, shrubs, persistent emergent, emergent mosses or lichens, or wetlands lacking such vegetation, but with the following four characteristics: 1) area less than 20 acres; 2) active wave-formed or bedrock shoreline features lacking; 3) water depth in deepest part of basin less than 8.2 feet at low water; and 4) salinity due to ocean-derived salts less than 0.5 parts per thousand (ppt) (Cowardin et al, 1979)(FGDC, 2013).

Several ruderal, excavated basins were present along the Lateral 4 Alignment. These facilities are common in agricultural communities for storing water runoff, primarily from irrigation. Many of the basins were cleared of all native vegetation and the banks were riddled with ground squirrel burrows. California toads (*Anaxyrus boreas halophilus*), San Joaquin fence lizards *(Sceloporus occidentalis biseriatus),* western side-blotched lizards (*Uta stansburiana elegans*), and great egret (*Ardea alba*) were observed within basins along the proposed Lateral 4 alignment.

[redacted]

Dairy lagoons were prevalent amongst the many dairy farms adjacent to the proposed Lateral 4 Alignment. Although not optimal, these waste settling ponds are undoubtedly valuable to wildlife species in the absence of superior wetland or aquatic habitat. Some of the dairy ponds contained emergent vegetation which could be used by waterfowl for nesting. During the biological survey, the following avian species were observed foraging within dairy lagoons adjacent to the proposed Lateral 4 alignment: mallard (*Anas platyrhynchos*), blue-winged teal (*Anas discors*), cinnamon teal (*Anas cyanoptera*), killdeer (*Charadrius vociferous*), black-necked stilt

(*Himantopus mexicanus*), whimbrel (*Numenius phaeopus*), and great egret (*Ardea alba*); and the following species were observed [redacted] cliff swallow (*Petrochelidon pyrrhonota*). The dairy lagoon housing the burrowing owl was surrounded by barren, compacted dirt road, in the immediate vicinity of an expanse of dairy-forage fields and one fallow field overgrown with vegetation, classified as ruderal-annual grassland for the purposes of this report.

Several of the burrows within the banks of the dairy lagoon were large enough to house foxes, skunks, American badger, or coyote. However, many of these large burrows were located on the lower half of the interior banks, subject to periodic inundation, and therefore of relatively low quality as a natal pupping den, or for general refuge or rearing young.

At the time of the field survey, the excavated canal [redacted] was overgrown with weedy riparian vegetation, predominantly invasive. The following species were observed: narrow leaf cattail (*Typha angustifolia*), invasive mustard *(Brassica nigra, Brassica rapa)*, invasive grasses (*Bromus diandrus*, *Bromus madritensis*, *Hordeum murinum, Arundo donax),* invasive cheeseweed *(Malva parviflora),* invasive curly dock (*Rumex crispus*), invasive sheep sorrel (*Rumex acetosella*), native bedstraw (*Galium aparine*), native cocklebur (*Xanthium strumarium*), native California mugwort (*Artemisia douglasiana*), native miner's lettuce (*Claytonia perfoliata*), non-native chickweed (*Stellaria media*), invasive California burclover (*Medicago polymorpha*), non-native big heron bill (*Erodium botrys),* invasive poison hemlock *(Conium maculatum),* native hemlock water parsnip *(Sium suave),* and non-native horse nettle *(Solanum elaeagnifolium)*. The channel of this canal was dry, with the exception of one standing pool of water at the western terminus. Blue-winged teal (*Anas discors*) and cinnamon teal (*Anas cyanoptera*) were observed wading and American bullfrog (*Lithobates catesbeianus*) and California toad (*Anaxyrus boreas halophilus*) vocalizations were heard.

Portions of the upper interior canal banks lacking vegetation housed an abundant ground squirrel population, and several burrows suitable for burrowing owl were observed. One burrow was proven to be currently active by the presence of a burrowing owl individual which flushed into an adjacent dairy-forage field during the field survey.

There is an existing excavated basin [redacted] This basin appears to serve a dual purpose as a ponding basin for irrigation runoff and as cropland, as dairy-forage crops are planted in the floor. The interior banks contained an abundance of ground squirrel burrows, many of which were rather large, especially those dug into erosion channels. Burrowing owls were present in this location. [redacted] It is estimated that 8-10 burrowing owls were inhabiting this site at the time of the field survey. Several of the burrows observed at this location were large enough to serve as suitable habitat for foxes, coyotes, or an American badger. Mammal tracks observed in this area included coyote, domestic dog, California ground squirrel, and fox (indistinguishable to species).

2.4 Soils

2.4.1 Deer Creek Project Area

Two soil mapping units, representing two soil series were identified on the Deer Creek Project site. Soils within the channel of Deer Creek are classified as Riverwash, and soils along both banks are mapped as Akers-Akers, saline-Sodic, complex, 0 to 2 percent slopes. Riverwash is considered a hydric soil, although this soil is associated with stream and river channels that are dry most of the year. The surface consists of sand and gravel and supports little vegetation. Hydric soils are defined as soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions such that under sufficiently wet conditions hydrophytic vegetation is supported. Hydrophytic vegetation is present within the channel and along each of the banks. The riparian corridor extends out to the barren compacted dirt road along top of bank.

The Akers soil series and Akers, Saline-sodic soil series consists of deep, well-drained soils formed in alluvium derived from granite rock. This soil is associated with irrigated croplands that have been leveled and reclaimed with soil amenders. The Akers portion has moderate permeability, and the saline-sodic Akers component has moderately slow permeability. Flooding is rare for both components. The following are minor components, each representing less than 3% of the map unit: Tujunga, Colpien, Grangeville, Hanford, Yettem, Tagus, and unnamed soil within a ponded area. The unnamed, ponded soil component, which represents 1% of the map unit, is the only hydric soil within this complex.

2.4.2 Lateral 4 Alignment

Six soil mapping units, representing six soil series were identified on the Lateral 4 Alignment Project site: Akers-Akers, saline-Sodic, complex, 0 to 2 percent slopes; Biggriz-Biggriz, saline-Sodic, complex, 0 to 2 percent slopes; Colpien loam, 0 to 2 percent slopes; Gambogy loam, drained, 0 to 1 percent slopes; Hanford sandy loam, 0 to 2 percent slopes; and Tagus loam, 0 to 2 percent slopes.

Akers-Akers, saline-Sodic, complex, 0 to 2 percent slopes comprises 18.1% of the mapped Project area. This soil series was described in **Section 2.4.1** above, and therefore, will not be repeated here.

Biggriz-Biggriz, saline-Sodic, complex, 0 to 2 percent slopes comprises 9.4% of the mapped Project area. This soil is situated on fan remnants and associated with irrigated croplands that have been leveled and drained. Both components are deep, somewhat poorly drained with moderately slow permeability. Both are derived from alluvium from granite rock and both rarely flood. The following are minor components, each representing less than 3% of the map unit: Nord, Gambogy, Garces, Tujunga, Lethent, Colpien, and unnamed soil within a ponded area. The unnamed, ponded soil component, which represents 1% of the map unit, is the only hydric soil within this complex.

Colpien loam, 0 to 2 percent slopes comprises 15.6% of the mapped Project area. This soil is associated with irrigated croplands that have been leveled and reclaimed with soil amenders. This unit is deep, moderately well-drained with moderately slow permeability. It is derived from alluvium from granite rock and rarely floods. The following are minor components, each representing less than 3% of the map unit: Gambogy, Hanford, Biggriz, Tujunga, Nord, and Akers, saline-Sodic. Colpien loam is not considered a hydric soil, nor are any of the minor components.

Gambogy loam, drained, 0 to 1 percent slopes comprises 16.2% of the mapped Project area. This soil is typically associated with irrigated cropland growing cotton, alfalfa, and grains and for dairy and cattle production. This soil is poorly drained with moderately slow permeability. It is derived from alluvium from granite rock and rarely floods. The following are minor components, each representing less than 3% of the map unit: Hanford, Grangeville, Colpien, Tujunga, Nord, and Yettem. Gambogy loam is not considered a hydric soil, nor are any of the minor components.

Hanford sandy loam, 0 to 2 percent slopes comprises 1.1% of the mapped Project area. This soil, which is situated on flood plains and alluvial fans, is associated with irrigated croplands that have been leveled and reclaimed with soil amendments. This unit is deep, moderately well-drained, with moderate permeability, and it rarely floods. The following are minor components, each representing less than 5% of the map unit: Tujunga, Exeter, Calgro, and Yettem. Hanford sandy loam is not considered a hydric soil, nor are any of the minor components.

Tagus loam, 0 to 2 percent slopes comprises 39.6% of the mapped Project area. This soil is typically associated with irrigated cropland to grow cotton, corn, wheat, barley, walnuts, almonds, and alfalfa. It is also used for dairy and cattle production and building site development. Tagus soils are well-drained with moderate permeability, and it rarely floods. The following are minor components, each representing less than 5% of the map unit: Hanford, Tujunga, Grangeville, and Colpien. Tagus loam is not considered a hydric soil, nor are any of the minor components.

The complete Natural Resources Conservation Service (NRCS) Web Soil Survey report is available in **Appendix E** at the end of this document.

2.5 Natural Communities of Special Concern

Natural communities of special concern are those that are of limited distribution, distinguished by significant biological diversity, or home to special status species. CDFW is responsible for the classification and mapping of all natural communities in California. Just like the special status plant and animal species, these natural communities of special concern can be found within the CNDDB.

According to CNDDB, there are no recorded observations of natural communities of special concern with potential to occur within the Project area or vicinity. Additionally, no natural communities of special concern were observed during the biological survey.

2.6 Designated Critical Habitat

The USFWS often designates areas of “Critical Habitat” when it lists species as threatened or endangered. Critical Habitat is a specific geographic area that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection.

According to CNDDB and IPaC, designated critical habitat is absent from the Project area and vicinity.

2.7 Wildlife Movement Corridors

Wildlife movement corridors are routes that animals regularly and predictably follow during seasonal migration, dispersal from native ranges, daily travel within home ranges, and inter-population movements. Movement corridors in California are typically associated with valleys, ridgelines, and rivers and creeks supporting riparian vegetation.

The banks of Deer Creek could be used as a movement corridor for wildlife during dispersal or migratory activities, but the Project’s location near State Route 99 and the Union Pacific Railroad would make that unlikely. The remainder of the Project areas along the proposed Lateral 4 alignment do not contain any features that would be likely to function as wildlife movement corridors. Furthermore, the Project is located in a region often disturbed by intensive agricultural cultivation practices and human disturbance which would discourage dispersal and migration.

2.8 Special Status Plants and Animals

California contains several “rare” plant and animal species. In this context, “rare” is defined as species known to have low populations or limited distributions. As the human population grows, resulting in urban expansion which encroaches on the already limited suitable habitat, these sensitive species become increasingly more vulnerable to extirpation. State and Federal regulations have provided the CDFW and the U.S. Fish and Wildlife Service (USFWS) with a mechanism for conserving and protecting the diversity of plant and animal species native to California. Numerous native plants and animals have been formally designated as “threatened” or “endangered” under state and federal endangered species legislation. Other formal designations include “candidate” for listing or “species of special concern” by CDFW. The California Native Plant Society (CNPS) has its list of native plants considered rare, threatened, or endangered. Collectively these plants and animals are referred to as “special status species.”

A thorough search of the CNDDB for published accounts of special status plant and animal species was conducted for the four 7.5-minute quadrangles containing the Project areas: *Taylor Weir, Tipton, Alpaugh,* and *Pixley,* and for all 12 of the neighboring quadrangles: *Allensworth, Delano West, Delano East, Sausalito School,* *Hacienda Ranch, Woodville, Hacienda Ranch NE, Corcoran, Waukena, Paige, Tulare,* and *Cairns Corner*. An official species list was obtained using the USFWS IPaC system for federally listed species with potential to be affected by the Project. These species, and their potential to occur within the Project area are listed in **Table 1** and **Table 2** on the following pages. Additionally, Section 7 determinations are made in **Table 3** in **Section 3.5**. Raw data obtained from CNDDB and IPaC are available in **Appendix B** and **Appendix C**, respectively, at the end of this document. Other sources of information utilized in the preparation of this analysis included the California Native Plant Society (CNPS) Online Inventory of Rare and Endangered Vascular Plants of California, CalFlora's online database of California native plants, the Jepson Herbarium online database (Jepson eFlora), U.S. Fish and Wildlife Service (USFWS) Environmental Conservation Online System (ECOS), the NatureServe Explorer online database, the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Plants Database, the California Department of Fish and Wildlife (CDFW) California Wildlife Habitat Relationships (CWHR) database, ebird.org, and the California Herps online database. **Figure 2** shows the Project's 7.5-minute quadrangles, according to USGS Topographic Maps.

Table 1. List of Special Status Animals with Potential to Occur Onsite and/or in the Vicinity

Species	Status	Habitat	Occurrence on Project Site
American badger (*Taxidea taxus*)	CSC	Grasslands, savannas, and mountain meadows near timberline are preferred. Most abundant in drier open spaces of shrub and grassland. Burrows in soil.	**Possible.** This species reportedly inhabits the undisturbed grassland habitats of the Pixley National Wildlife Refuge, which is located approximately 3.5 miles west of the Deer Creek check structure. According to CNDDB, in 2016 an American badger individual was found dead on Highway 43 in an area surrounded by agricultural uses, south of the Pixley National Wildlife Refuge and near Colonel Allensworth State Historic Park, approximately 7 miles southwest of the Deer Creek check structure. Deer creek runs along the southern border of the Pixley National Wildlife Refuge, and special status mammals, such as the American badger, could use the intermittent creek as a movement corridor. Surveyed Project areas contained a vast ground squirrel population and an abundance of burrows. Frequent human disturbance would likely discourage habitation of this elusive mammal, especially when superior habitat is present within Pixley National Wildlife Refuge in the vicinity. However, this species is highly mobile, and an American badger individual could pass through Project areas during dispersal or mating movements.
Bakersfield legless lizard (*Anniella grinnelli*)	CSC	Found primarily underground, burrowing in loose, sandy soil. Forages in loose soil and leaf litter during the day. Occasionally observed on the surface at dusk and night. Prefers soil with a high moisture content.	**Possible.** Four Bakersfield legless lizard individuals were collected in 2016 and 2017 along Deer Creek, adjacent to Pixley National Wildlife Refuge, approximately 3 miles west of the Deer Creek check structure. Although this species was thought to only occur in Kern County, the CNDDB observations from 2016 and 2017 in the vicinity of the Project were made by *Anniella* expert, Theodore Papenfuss and should therefore be considered credible. Project areas frequently disturbed by agricultural production may be unsuitable for this species, but suitable habitat is present along the riparian corridor of Deer Creek and beneath piles of debris throughout Project areas.

Species	Status	Habitat	Occurrence on Project Site
blunt-nosed leopard lizard (*Gambelia sila*)	FE, CE, CFP	Inhabits semi-arid grasslands, alkali flats, low foothills, canyon floors, large washes, and arroyos, usually on sandy, gravelly, or loamy substrate, sometimes on hardpan. Often found where there are abundant rodent burrows in dense vegetation or tall grass. Cannot survive on lands under cultivation. Known to bask on kangaroo rat mounds and often seeks shelter at the base of shrubs, in small mammal burrows, or in rock piles. Adults may excavate shallow burrows, but rely on deeper pre-existing rodent burrows for hibernation and reproduction.	**Possible.** This species is known to occur within Pixley National Wildlife Refuge and Allensworth Ecological Reserve and in the vicinity of the Project. However, all of the proposed impact areas along the proposed alignment for the Lateral 4 Canal are frequently disturbed by cultivation and activities related to agricultural production, and therefore unsuitable for this species. However, this species could pass through Project areas, especially along Deer Creek or in adjacent areas less frequently disturbed. Small mammal burrows are abundant throughout.
burrowing owl (*Athene cunicularia*)	CSC	Resides in open, dry annual or perennial grasslands, deserts, and scrublands with low growing vegetation. Nests underground in existing burrows created by burrowing mammals, most often ground squirrels.	**Present.** Several burrowing owl individuals were observed during the biological reconnaissance survey, and this species will be discussed in detail in **Section 3.3.3.**
California red-legged frog (*Rana draytonii*)	FT	Inhabits perennial rivers, creeks, and stock ponds with vegetative cover within the Coast Range and northern Sierra foothills.	**Absent.** The Project area does not provide suitable habitat for this species and is outside of its current known range.
coast horned lizard (*Phrynosoma blainvillii*)	CSC	Found in grasslands, coniferous forests, woodlands, and chaparral, primarily in open areas with patches of loose, sandy soil and low-lying vegetation in valleys, foothills, and semi-arid mountains. Frequently found near ant hills and along dirt roads in lowlands along sandy washes with scattered shrubs.	**Possible.** This species is known to occur within Pixley National Wildlife Refuge and Allensworth Ecological Reserve and in the vicinity of the Project. Although dirt roads are prevalent throughout Project areas, ant hills were not observed, and the highly disturbed habitats and densely vegetated habitats of the Project areas are generally unsuitable for this species.
conservancy fairy shrimp (*Branchinecta conservatio*)	FE	Endemic to the grasslands of the northern two-thirds of the Central Valley. Found in large, turbid pools.	**Unlikely.** Vernal pools are absent from the Project areas. While areas of seasonal and ephemeral pooling were observed adjacent to the proposed Lateral 4 canal alignment, these areas are subject to frequent disturbance associated with agricultural production and therefore generally unsuitable for this species. This species could potentially occur within ephemeral pools, such as those observed onsite, but the frequent disturbance and use of agricultural chemicals make Project areas unlikely to sustain a population of vernal pool branchiopods.

Species	Status	Habitat	Occurrence on Project Site
Delta smelt (*Hypomesus transpacificus*)	FT, CE	This pelagic and euryhaline species is Endemic to the Sacramento-San Joaquin River Delta, upstream through Contra Costa, Sacramento, San Joaquin, and Solano Counties.	**Absent.** Suitable perennial aquatic habitat for this species is absent from the Project area and surrounding lands. The Project is outside of the current distribution range of this species.
fulvous whistling-duck (*Dendrocygna bicolor*)	CSC	Found in freshwater wetlands, flooded rice fields, grasslands, and pasture. Nests are bowl-shaped, in floating or flooded emergent vegetation.	**Unlikely.** Although the Project is located within the historic range of this species, fulvous whistling-ducks are now an irregular and unlikely occurrence in Tulare County. The most recent observations of this species occurred in 2006 at Pixley National Wildlife Refuge and at "Dead Pig Ponds" in Tulare County (Shuford and Gardali, 2008). Typical suitable habitat (freshwater wetlands and flooded rice fields) are absent from Project areas. The Project is located outside of the current breeding and wintering range of this species.
giant gartersnake (*Thamnophis gigas*)	FT, CT	Occurs in marshes, sloughs, drainage canals, irrigation ditches, rice fields, and adjacent uplands. Prefers locations with emergent vegetation for cover and open areas for basking. This species uses small mammal burrows adjacent to aquatic habitats for hibernation in the winter and to escape from excessive heat in the summer.	**Absent.** Habitats required by this species are absent from the Project area and surrounding lands. The Project is outside of the current distribution range of this species.
Kern Brook Lamprey (*Entosphenus hubbsi*)	CSC	Silty backwaters of large rivers in the foothill's region. Requires slight flow and shallow pools with sand, gravel, rubble, and mud substrate in areas where summer temperatures rarely exceed 77 degrees Fahrenheit.	**Absent.** Habitats required by this species are absent from the Project area and surrounding lands. The Project is outside of the current distribution range of this species.
mountain plover (*Charadrius montanus*)	CSC	Breeds on open plains at moderate elevations. Winters in short-grass plains and fields, plowed or fallow fields, and sandy deserts. Prefers flat, bare ground with burrowing rodents.	**Possible.** The Project is located within the current winter range of this species in the Central Valley (generally south of Sacramento and west of State Route 99). The most recent observation of this species was a flock of 645 plovers in the winter of 2005, just south of Allensworth (Shuford and Gardali, 2008), which is approximately 7 miles southwest of the Project. It is unlikely that nesting mountain plovers will be encountered, but a wintering flock could potentially occur within a fallow field in the vicinity of the Project.

Species	Status	Habitat	Occurrence on Project Site
Nelson's antelope squirrel (*Ammospermophilus nelsoni*)	CT	Found in the western San Joaquin Valley on dry, sparsely vegetated loamy soils. Relies heavily on existing small mammal burrows.	**Unlikely.** This species was observed in 1991 at Colonel Allensworth State Historic Park, approximately 7 miles southwest of Project. Although the Project is located within its historic range, this species has been nearly eliminated from the floor of the Tulare Basin. The habitats of the Project areas are frequently disturbed by agricultural practices, which likely also involve the use of rodenticides. This species often coexists with the giant kangaroo rat and inhabits abandoned burrow precincts. The Project area is outside of the known distribution range of the giant kangaroo rat and burrow precincts indicative of kangaroo rats were not observed during the biological survey. Furthermore, ground squirrel individuals and burrows were abundant throughout most of the surveyed areas. California ground squirrels have a propensity to inhabit disturbed lands and displace smaller fossorial species, such as the giant kangaroo rat and antelope squirrel. Harris and Stearns (1991) concluded that "on small habitat fragments surrounded by disturbed or agricultural lands, the potential for California ground squirrels to have a negative impact on antelope squirrels may be significant."
San Joaquin coachwhip (*Masticophis flagellum ruddocki*)	CSC	Found in open dry habitats with little or no tree cover in valley grassland and saltbush scrub communities in the San Joaquin Valley. Relies on mammal burrows for refuge and oviposition sites.	**Unlikely.** This species was observed in 1992 within uncultivated alkali sink scrub in Allensworth Ecological Reserve, approximately 7 miles southwest of the Project area. Small mammal burrows are abundant throughout the site. According to californiaherps.com (2019), this species is thought to be sensitive to disturbance and does not persist in cultivated areas. Therefore, the Project areas, which are frequently disturbed by intensive agricultural practices, are generally unsuitable for this species.

Species	Status	Habitat	Occurrence on Project Site
San Joaquin kit fox (*Vulpes macrotis mutica*)	FE, CT	Underground dens with multiple entrances in alkali sink, valley grassland, and woodland in valleys and adjacent foothills.	**Possible.** There are several recorded observations of this species in the vicinity of the Project, especially within Pixley National Wildlife Refuge and Allensworth Ecological Reserve. Deer creek runs along the southern border of the Pixley National Wildlife Refuge, and special status mammals, such as the San Joaquin kit fox, could use the intermittent creek as a movement corridor. Surveyed Project areas contained a vast ground squirrel population and an abundance of burrows, many large enough to provide refugia for kit fox. Frequent human disturbance would likely discourage habitation within Project areas, especially when superior habitat is present within Pixley National Wildlife Refuge in the vicinity. However, this species is highly mobile, and a kit fox individual could pass through Project areas during dispersal or mating movements.
Swainson's hawk (*Buteo swainsoni*)	CT	Nests in large trees in open areas adjacent to grasslands, grain or alfalfa fields, or livestock pastures suitable for supporting rodent populations.	**Likely.** Swainson's hawks are not uncommon in this portion of the Central Valley. There are several recorded observations of nesting Swainson's hawks, especially along Deer Creek in Pixley National Wildlife Refuge, which is located approximately 3.5 miles west of the Deer Creek check structure. Nesting habitat is present in the Cottonwoods along Deer Creek adjacent to the check structure and in a grove of walnut trees adjacent to the proposed Lateral 4 canal alignment. Foraging habitat is present throughout all surveyed Project areas in the form of agricultural and fallow fields.

Species	Status	Habitat	Occurrence on Project Site
Tipton kangaroo rat *(Dipodomys nitratoides nitratoides*)	FE, CE	Burrows in soil. Often found in grassland and shrubland.	**Unlikely.** There are several recorded observations of this species in the vicinity of the Project, especially within Pixley National Wildlife Refuge, which is located approximately 3.5 miles west of the Project, and Allensworth Ecological Reserve, which is located approximately 7 miles southwest of the Project. However, recent follow-up studies have found few, if any Tipton kangaroo rat individuals occurred at either of these sites, until 2007 when 144 individuals were translocated to Allensworth Ecological Reserve (USFWS, 2010). Surveyed Project areas contained a vast ground squirrel population and an abundance of burrows, although no burrow precincts indicative of kangaroo rats was observed. The disturbed habitats of the Project areas are generally unsuitable for this species.
tricolored blackbird (*Agelaius tricolor*)	CCE, CSC	Nests colonially near fresh water in dense cattails or tules, or in thickets of riparian shrubs. Forages in grassland and cropland. Large colonies are often found on dairy farm forage fields.	**Likely.** Suitable nesting and foraging habitat is present in the form of dairy-forage fields along the proposed Lateral 4 canal alignment. Several colonies of tricolored blackbird have been observed and monitored in the vicinity of the Project (Colibri, 2017 and 2018). Several of these colonies demonstrate site fidelity and return to the same fields yearly. Suitable nesting and foraging habitat in the form of dairy-forage fields was abundant along the proposed Lateral 4 canal alignment. Colonies of red-winged blackbirds were observed during the biological survey.
Tulare grasshopper mouse (*Onychomys torridus tularensis*)	CSC	Typically inhabit arid shrubland communities in hot, arid grassland and shrubland associations. Diet consists almost exclusively of arthropods.	**Absent.** There have been no recorded observations of this species in the last 50 years in the vicinity of the Project, which includes a 16-quad search of the CNDDB. Although the Project is located within the historic range of this species, the Tulare grasshopper mouse is thought have been extirpated in Tulare county and the rest of the Valley floor. Intensive trapping efforts in Pixley National Wildlife Refuge and other parts of Tulare County failed to result in the capture of any Tulare grasshopper mouse individuals.

Species	Status	Habitat	Occurrence on Project Site
vernal pool fairy shrimp (*Branchinecta lynchi*)	FT	Occupies vernal pools, clear to tea-colored water, in grass or mud-bottomed swales, and basalt depression pools.	**Unlikely.** Vernal pools are absent from the Project areas. While areas of seasonal and ephemeral pooling were observed adjacent to the proposed Lateral 4 canal alignment, these areas are subject to frequent disturbance associated with agricultural production and therefore generally unsuitable for this species. This species could potentially occur within ephemeral pools, such as those observed onsite, but the frequent disturbance and use of agricultural chemicals make Project areas unlikely to sustain a population of vernal pool branchiopods.
western snowy plover (*Charadrius alexandrinus nivosus*)	FT, CSC	Typically found on sandy beaches, salt pond levees, and shores of large alkali lakes.	**Possible.** The Project is located within the historic and current breeding range of this species. Although there have been no recorded observations of this species in the past 25 years in the vicinity of the Project, the dairy lagoons and excavated basins onsite provide suitable nesting habitat.
western spadefoot (*Spea hammondii*)	CSC	Prefers open areas with sandy or gravelly soils, in a variety of habitats including mixed woodlands, grasslands, coastal sage scrub, chaparral, sandy washes, lowlands, river floodplains, alluvial fans, playas, alkali flats, foothills, and mountains. Vernal pools or temporary wetlands, lasting a minimum of three weeks, which do not contain bullfrogs, fish, or crayfish are necessary for breeding.	**Possible.** The disturbed habitats of the Project areas are generally unsuitable for this species. However, seasonal and ephemeral pools were observed during the biological survey which could serve as marginal breeding habitat, and the site contained an abundance of rodent burrows which could serve as aestivation habitat. There have been several recorded observations of this species in the vicinity of the Project, including one within 2 miles of the Deer Creek check structure.

Table 2. List of Special Status Plants with Potential to Occur Onsite and/or in the Vicinity

Species	Status	Habitat	Occurrence on Project Site
Alkali mariposa-lily (*Calochortus striatus*)	CNPS 1B	Found in the Sierra Nevada foothills, desert mountains, and Mojave desert in alkaline meadows and ephemeral washes within chaparral, chenopod scrub, Mojavean desert scrub, meadows and seep communities. There is some confusion about the accepted elevation range for this species, but it has been cited as low as 70 meters (230 feet) and as high as 1600 meters (5250 feet). Blooms April – June.	**Absent.** The disturbed habitats of the Project area are unsuitable for this species. The Project is near or outside of the elevational range for this species. The only record of this species within Tulare County includes one plant observed in undisturbed valley sink scrub habitat of Allensworth Ecological Reserve, approximately 7 miles southwest of the Deer Creek check structure, 22 years ago.
brittlescale (*Atriplex depressa*)	CNPS 1B	Found in the San Joaquin Valley and Sacramento Valley in alkali or clay soils in shadescale scrub, valley grassland, alkali sink, and riparian communities at elevations below 1050 feet. Equally likely to occur in wetlands and non-wetlands. Blooms June – October.	**Absent.** The disturbed habitats of the Project areas are unsuitable for this species. There have been no observations of this species in the vicinity of the Project in over 30 years.
California alkali grass (*Puccinellia simplex*)	CNPS 1B	Found in the San Joaquin Valley and other parts of California in saline flats and mineral springs within valley grassland and wetland-riparian communities at elevations below 3000 feet. Blooms March – May.	**Absent.** Suitable habitat required by this species is absent from the Project area and the disturbed nature of the Project areas make the sites further unsuitable. The nearest known occurrence of this species was recorded approximately 8 miles northwest of the Project area in 1983.
California jewelflower (*Caulanthus californicus*)	FE, CE, CNPS 1B	Found in the San Joaquin Valley and Western Traverse Ranges. Occurs on flats and slopes, generally in non-alkaline grassland at elevations between 230 feet and 3280 feet. Blooms February – April.	**Absent.** Suitable habitat required by this species is absent from the Project area. All of the recorded occurrences of this species in the vicinity of the Project have been updated to extirpated or possibly extirpated due to conversion of land to agriculture.

Species	Status	Habitat	Occurrence on Project Site
Coulter's goldfields (*Lasthenia glabrata ssp. coulteri*)	CNPS 1B	Found in salt marshes, playas, and vernal pools at elevations below 3200 feet. Blooms April – May.	**Absent.** Suitable habitat required by this species is absent from the Project area. The only record of this species in the vicinity includes an observation near Pixley National Wildlife Refuge, which is located approximately 3.5 miles west of the Deer Creek check structure, over 50 years ago.
Earlimart Orache (*Atriplex cordulata var. erecticaulis)*	CNPS 1B	Found in the San Joaquin Valley in saline or alkaline soils at elevations below 325 feet. Equally likely to occur within wetlands and non-wetlands. Blooms August – September.	**Unlikely.** The disturbed habitats of the Project areas are unsuitable for this species. There are several observations of this species in the vicinity of the Project, but many of the populations are thought to have been extirpated due to conversion of land to agriculture.
Kern mallow (*Eremalche parryi ssp. kernensis*)	FE, CNPS 1B	Found on open, dry, sandy to clay soils, usually within valley saltbush scrub at elevations between 325 – 3300 feet. Blooms March – May.	**Absent.** The disturbed habitats of the Project areas are unsuitable for this species. The Project is near or outside of the elevational range for this species. There have been no observations of this species in the vicinity in over 30 years.
lesser saltscale (*Atriplex minuscula*)	CNPS 1B	Found in the San Joaquin Valley in playas; sandy, alkaline soils in shadescale scrub, valley grassland, and alkali sink communities at elevations below 300 feet. Blooms April – October.	**Unlikely.** Suitable habitat required by this species is absent from the Project area and the frequent disturbance associated with agricultural production is unsuitable for this species. The nearest known occurrence of this species was recorded at an unknown location west of Earlimart in 1993.
Lost Hills crownscale (*Atriplex coronata var. vallicola*)	CNPS 1B	Found in the San Joaquin Valley in chenopod scrub, valley and foothill grassland, and vernal pools at elevations below 1400 feet. Typically found in dried ponds on alkaline soils. Blooms April – September.	**Absent.** There have been two observations of this species in the vicinity of the Project, and both were within undisturbed powdery, alkaline soils in vernal pools within grasslands, and both observations were made more than 30 years ago. Habitats required by this species are absent from the Project areas.

Species	Status	Habitat	Occurrence on Project Site
recurved larkspur (*Delphinium recurvatum*)	CNPS 1B	Found in the San Joaquin Valley and other parts of California. Occurs in poorly drained, fine, alkaline soils in grassland at elevations between 100 feet and 1965 feet. Most often found in non-wetlands, but occasionally found in wetlands. Blooms March – June.	**Unlikely.** There is a historic (1938) observation of this species mapped near the Highway 99 bridge over Deer Creek, which is adjacent to the Deer Creek check structure. However, the disturbed nature of the Project area is generally unsuitable for his species. Furthermore, the conversion of native grassland to agricultural crops, and competition from invasive species has extirpated many populations of this species in the Central Valley. Known extant populations occur in undisturbed grasslands.
San Joaquin adobe sunburst (*Pseudobahia peirsonii*)	FT, CE, CNPS 1B	Found in the San Joaquin Valley and the Sierra Nevada Foothills in bare dark clay in valley grassland and foothill woodland communities at elevations between 325 feet and 2950 feet. Blooms March – May.	**Absent.** Habitats required by this species are absent from the Project area and surrounding lands. The Project site is near or outside of the elevational range for this species. The only record of this species in the vicinity is a historic collection (1897) at an unspecified location, which has since been updated to extirpated.
San Joaquin woollythreads (*Monolopia congdonii*)	FE, CNPS 1B	Occurs in the San Joaquin Valley in sandy soils in shadescale shrub and grasslands at elevations between 300 feet and 2300 feet. Found primarily in non-wetlands, but occasionally found in wetlands. Blooms February – May.	**Absent.** Habitats required by this species are absent from the Project area and surrounding lands. The Project site is near or outside of the elevational range for this species. The only record of this species is from a historic collection (1881) at an unspecified location of "Deer Creek, Tulare County." According to CNPS, this species is thought to be extirpated from Tulare County.
slough thistle (*Cirsium crassicaule*)	CNPS 1B	Found in the San Joaquin Valley in freshwater sloughs, marshes, and riverbanks at elevations below 300 feet. Blooms March – June.	**Absent.** Disturbance and absence of preferred habitat makes the Project areas unsuitable for this species. The only observation of this species in the vicinity was recorded 48 years ago, approximately 20 miles southwest of the Project. The status of this observation has since been updated to possibly extirpated. According to CNPS, this species does not typically occur within Tulare County.

Species	Status	Habitat	Occurrence on Project Site
spiny-sepaled button-celery (*Eryngium spinosepalum*)	CNPS 1B	Found in the Sierra Nevada Foothills and portions of the San Joaquin Valley. Occurs in vernal pools, swales, and roadside ditches at elevations between 325 feet and 4160 feet in valley grassland, freshwater wetlands, and riparian communities. Blooms April – July.	**Absent**. Suitable habitat required by this species is absent from the Project area and surrounding lands. The Project site is near or outside of the elevational range for this species.
subtle orache (*Atriplex subtilis*)	CNPS 1B	Found in the San Joaquin Valley in saline depressions at elevations below 230 feet. Blooms June – October.	**Unlikely.** The disturbed habitats of the Project areas are unsuitable for this species. This species was not observed during the biological field survey. The nearest observation of this species was recorded in 1995, approximately 1 mile west of the Deer Creek check structure.
vernal pool smallscale (*Atriplex persistens*)	CNPS 1B	Occurs in San Joaquin Valley and Sacramento Valley in alkaline vernal pools at elevations below 375 feet. Usually found in wetlands, but occasionally found in non-wetlands. Blooms June – September.	**Absent.** Suitable habitat required by this species is absent from the Project area. The only reported occurrence of this species in the vicinity belongs to historic collection records dating from 1963 to 1985 from the Pixley Vernal Pool Preserve, approximately 6 miles northeast of the Project area.

EXPLANATION OF OCCURRENCE DESIGNATIONS AND STATUS CODES

Present:	Species observed on the site at time of field surveys or during recent past
Likely:	Species not observed on the site, but it may reasonably be expected to occur there on a regular basis
Possible:	Species not observed on the site, but it could occur there from time to time
Unlikely:	Species not observed on the site, and would not be expected to occur there except, perhaps, as a transient
Absent:	Species not observed on the site, and precluded from occurring there due to absence of suitable habitat

STATUS CODES

FE	Federally Endangered	CE	California Endangered
FT	Federally Threatened	CT	California Threatened
FPE	Federally Endangered (Proposed)	CCT	California Threatened (Candidate)
FPT	Federally Threatened (Proposed)	CFP	California Fully Protected
FC	Federal Candidate	CSC	California Species of Special Concern
		CWL	California Watch List
		CCE	California Endangered (Candidate)
		CR	California Rare

CNPS LISTING

1A	Plants Presumed Extinct in California	2	Plants Rare, Threatened, or Endangered in California, but more common elsewhere
1B	Plants Rare, Threatened, or Endangered in California and elsewhere		

3 Impacts and Mitigation

3.1 Significance Criteria

3.1.1 CEQA

General plans, area plans, and specific projects are subject to the provisions of CEQA. The purpose of CEQA is to assess the impacts of proposed projects on the environment prior to project implementation. Impacts to biological resources are just one type of environmental impact assessed under CEQA, and vary from project to project in terms of scope and magnitude. Projects requiring removal of vegetation may result in the mortality or displacement of animals associated with this vegetation. Animals adapted to humans, roads, buildings, and pets may replace those species formerly occurring on a site. Plants and animals that are state and/or federally listed as threatened or endangered may be destroyed or displaced. Sensitive habitats such as wetlands and riparian woodlands may be altered or destroyed. Such impacts may be considered either "significant" or "less than significant" under CEQA. According to *California Environmental Quality Act, Statute and Guidelines* (AEP 2012), "significant effect on the environment" means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic interest. Specific project impacts to biological resources may be considered "significant" if they would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS;

- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFW or USFWS;

- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;

- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;

- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or

- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Furthermore, CEQA Guidelines Section 15065(a) states that a project may trigger the requirement to make a "mandatory finding of significance" if the project has the potential to:

> "Substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species cause a fish or wildlife population to drop below self-sustaining levels threaten to eliminate a plant or animal community, reduce the number or restrict the range of an endangered, rare or threatened species, or eliminate important examples of the major periods of California history or prehistory."

3.1.2 NEPA

Federal projects are subject to the provisions of NEPA. The purpose of NEPA is to assess the effects of a proposed action on the human environment, assess the significance of those effects, and recommend measures that if implemented would mitigate those effects. As used in NEPA, a determination that certain effects on the human environment are "significant" requires considerations of both context and intensity (CFR 1508.27).

Context means that the significance of an action must be analyzed in terms of the affected environment in which a proposed action would occur. For the purposes of assessing effects of an action on biological resources, the relevant context is often local, which means the analysis requires a comparison of the action area's biological resources to the biological resources of the local area. However, the analysis may also require a comparison of the action area's biological resources with the biological resources of an entire region.

Intensity refers to the severity of impact. In considering intensity of impact to biological resources, it is necessary to address the unique qualities of wetlands and ecologically critical areas that may be affected, the degree to which the action will be controversial, the degree to which the effects will be controversial, the degree to which the effects will be uncertain, the degree to which the action will establish a precedent for future actions with potentially significant effects, and the potential for the action to result in cumulatively significant effects.

The effects of an action on some biological resources are generally considered to be "significant." An action that adversely affects federally listed threatened or endangered species, waters of the United States, or migratory movements of fish and wildlife are some examples of significant effects.

NEPA requires disclosure of feasible mitigation measures for the effects of an action on the environment. Suitable measures include the following:

a) Avoidance of the effect by not taking a certain action or parts of an action.
b) Mitigation of the effect by limiting the degree or magnitude of the action and its implementation.
c) Rectifying the effect by repairing, rehabilitating, or restoring the affected environment.
d) Reducing or eliminating the effect over time by preservation and maintenance operations throughout the life of the action.
e) Compensating for the effect by replacing or providing substitute resources or environments.

This report identifies likely effects of an action, identifies those that may be considered significant pursuant to the provisions of NEPA, and provides mitigation measures to avoid adverse effects to biological resources.

3.2 Relevant Goals, Policies, and Laws

3.2.1 Tulare County General Plan

The Tulare County General Plan (2012) sets forth the following goals and policies that protect biological resources and which have potential relevance to the Project:

- The County shall encourage the planting of native trees, shrubs, and grasslands in order to preserve the visual integrity of the landscape, provide habitat conditions suitable for native vegetation and wildlife, and ensure that a maximum number and variety of well-adapted plants are maintained.
- The County shall protect riparian areas through habitat preservation, designation as open space or recreational land uses, bank stabilization, and development controls.
- The County shall require mining reclamation plans and other management plans to include measures that protect, maintain, and restore riparian resources and habitats.
- The County shall support the preservation and management of wetland and riparian plant communities for passive recreation, groundwater recharge, and wildlife habitats.
- The County shall review development proposals against the California Natural Diversity Data Base, and other available studies provided by the California Department of Fish and Game, and consult, as appropriate, with the California Department of Fish and Game and U.S. Fish and Wildlife to assist in identifying potential conflicts with sensitive natural communities or special status species.
- On project sites that have the potential to contain species of local or regional concern, sensitive natural communities or special-status species, the County shall require the project applicant to have the site surveyed and mapped by a qualified biologist. A report on the finding of this survey shall be submitted to the County as part of the application and environmental review process.
- The County shall continue efforts to maintain and enlarge wetland preserves, which provide waterfowl habitat necessary to the maintenance of the flyway route through the valley. Such wetlands should also be protected through stormwater management programs, erosion control, and public education.

3.2.2 Threatened and Endangered Species

Permits may be required from the USFWS and/or CDFW if activities associated with a Project have the potential to result in the "take" of a species listed as threatened or endangered under the federal and/or state Endangered Species Acts. "Take" is defined by the state of California as "to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture or kill" (California Fish and Game Code, Section 86). "Take" is more broadly defined by the federal Endangered Species Act to include "harm" (16 USC, Section 1532(19), 50 CFR, Section 17.3). The CDFW and the USFWS are responding agencies under CEQA. Both agencies review CEQA documents in order to determine the adequacy of their treatment of endangered species issues and to make project-specific recommendations for their conservation.

3.2.3 Designated Critical Habitat

When species are listed as threatened or endangered, the USFWS often designates areas of "Critical Habitat" as defined by section 3(5)(A) of the federal Endangered Species Act (ESA). Critical Habitat is a term defined in the ESA as a specific geographic area that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection. Critical Habitat is a tool that supports the continued conservation of imperiled species by guiding cooperation with the federal government. Designations only affect federal agency actions or federally funded or permitted activities. Critical Habitat does not prevent activities that occur within the designated area. Only activities that involve a federal permit, license, or funding and are likely to destroy or adversely modify Critical Habitat will be affected.

3.2.4 Migratory Birds

The Federal Migratory Bird Treaty Act (MBTA: 16 USC 703-712) prohibits killing, possessing, or trading in any bird species covered in one of four international conventions to which the United States is a party, except in accordance with regulations prescribed by the Secretary of the Interior. The name of the act is misleading, as it actually covers almost all bird's native to the United States, even those that are non-migratory. The MBTA encompasses whole birds, parts of birds, and bird nests and eggs. Additionally, California Fish and Game Code makes it unlawful to take or possess any non-game bird covered by the MBTA (Section 3513), as well as any other native non-game bird (Section 3800).

3.2.5 Birds of Prey

Birds of prey are protected in California under provisions of Fish and Game Code (Section 3503.5), which states that it is unlawful to take, possess, or destroy any birds in the order Falconiformes (hawks and eagles) or Strigiformes (owls), as well as their nests and eggs. The bald eagle and golden eagle are afforded additional protection under the federal Bald and Golden Eagle Protection Act (16 USC 668), which makes it unlawful to kill birds or their eggs.

3.2.6 Nesting Birds

In California, protection is afforded to the nests and eggs of all birds. California Fish and Game Code (Section 3503) states that it is "unlawful to take, possess, or needlessly destroy the nest or eggs of any bird except as otherwise provided by this code or any regulation adopted pursuant thereto." Breeding-season disturbance that causes nest abandonment and/or loss of reproductive effort is considered a form of "take" by the CDFW.

3.2.7 Wetlands and other "Jurisdictional Waters"

The U.S. Army Corps of Engineers (USACE) regulates the filling or grading of Waters of the United States (Waters of the U.S.) under the authority of Section 404 of the Clean Water Act. Natural drainage channels and adjacent wetlands may be considered Waters of the U.S. or "jurisdictional waters" subject to the jurisdiction of the USACE. The extent of jurisdiction has been defined in the Code of Federal Regulations (CFR) and clarified by federal courts.

On June 29, 2015 the U.S. Environmental Protection Agency (EPA) and USACE jointly issued the Clean Water Rule (33 CFR 328.3) as a synthesis of statute, science, and U.S. Supreme Court decisions. The Clean Water Rule (33 CFR 328.3) defines Waters of the U.S. to include the following:

1) All waters used in interstate or foreign commerce (also known as "traditional navigable waters"), including all waters subject to the ebb and flow of the tide;
2) All interstate waters including interstate wetlands;
3) The territorial seas;
4) All impoundments of Waters of the U.S.;
5) All tributaries of waters defined in Nos. 1 through 4 above, where "tributary" refers to a water (natural or constructed) that contributes flow to another water and is characterized by the physical indicators of a bed and bank and an Ordinary High Water Mark (OHWM);
6) Adjacent waters, defined as either (a) located in whole or in part within 100 feet of the OHWM of waters defined in Nos. 1 through 5 above, or (b) located in whole or in part within the 100-year floodplain and within 1,500 feet of the OHWM of waters defined in Nos. 1 through 5 above;
7) Western vernal pools, prairie potholes, Carolina bays and Delmarva bays, pocosins, and Texas coastal prairie wetlands, if determined on a case-specific basis to have a significant nexus to waters defined in Nos. 1 through 3 above;
8) Waters that do not meet the definition of adjacency, but are determined on a case-specific basis to have a significant nexus to waters defined in Nos. 1 through 3 above, and are either

(a) located in whole or in part within the 100-year floodplain of waters defined in Nos. 1 through 3 above, or (b) located within 4,000 feet of the OHWM of waters defined in Nos. 1 through 5 above.

The 2015 rule also redefines exclusions from jurisdiction, which include:

1) Waste treatment systems;
2) Prior converted cropland;
3) Artificially irrigated areas that would revert to dry land should application of irrigation water to the area cease;
4) Groundwater;
5) Stormwater control features constructed to convey treat or store stormwater created in dry land; and
6) Three types of ditches: (a) ditches with ephemeral flow that are not a relocated or excavated tributary, (b) ditches with intermittent flow that are not a relocated or excavated tributary or that do not drain wetlands, and (c) ditches that do not flow, either directly or through another water, to a traditional navigable water.

A ditch may be a Water of the U.S. only it if meets the definition of "tributary" and is not otherwise excluded under the provision.

As determined by the United States Supreme Court in its 2001 *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers* (*SWANCC*) decision, channels and wetlands isolated from other jurisdictional waters cannot be considered jurisdictional on the basis of their use, hypothetical or observed, by migratory birds. Similarly, in its 2006 consolidated *Carabell/Rapanos* decision, the U.S. Supreme Court ruled that a significant nexus between a wetland and other navigable waters must exist for the wetland itself to be considered a navigable and therefore jurisdictional water. Furthermore, the Supreme Court clarified that the Environmental Protection Agency (EPA) and the USACE will not assert jurisdiction over ditches excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water.

The USACE regulates the filling or grading of Waters of the U.S. under the authority of Section 404 of the Clean Water Act. The extent of jurisdiction within drainage channels is defined by "ordinary high water marks" on opposing channel banks. All activities that involve the discharge of dredge or fill material into Waters of the U.S. are subject to the permit requirements of the USACE. Such permits are typically issued on the condition that the applicant agrees to provide mitigation that result in no net loss of wetland functions or values. No permit can be issued until the RWQCB issues a Section 401 Water Quality Certification (or waiver of such certification) verifying that the proposed activity will meet state water quality standards.

Under the Porter-Cologne Water Quality Control Act of 1969, the State Water Resources Control Board has regulatory authority to protect the water quality of all surface water and groundwater in the State of California ("Waters of the State"). Nine RWQCBs oversee water quality at the local and regional level. The RWQCB for a given region regulates discharges of fill or pollutants into Waters of the State through the issuance of various permits and orders. Discharges into Waters of the State that are also Waters of the U.S. require a Section 401 Water Quality Certification from the RWQCB as a prerequisite to obtaining certain federal permits, such as a Section 404 Clean Water Act permit. Discharges into all Waters of the State, even those that are not also Waters of the U.S., require Waste Discharge Requirements (WDRs), or waivers of WDRs, from the RWQCB. The RWQCB also administers the Construction Storm Water Program and the federal National Pollution Discharge Elimination System (NPDES) program. Projects that disturb one or more acres of soil must obtain a Construction General Permit under the Construction Storm Water Program. A prerequisite for this permit is the development of a Storm Water Pollution Prevention Plan (SWPPP) by a certified Qualified SWPPP Developer. Projects that discharge wastewater, storm water, or other pollutants into a Water of the U.S. may require a NPDES permit.

CDFW has jurisdiction over the bed and bank of natural drainages and lakes according to provisions of Section 1601 and 1602 of the California Fish and Game Code. Activities that may substantially modify such waters through the diversion or obstruction of their natural flow, change or use of any material from their bed or bank, or the deposition of debris require a Notification of Lake or Streambed Alteration. If CDFW determines that the activity may adversely affect fish and wildlife resources, a Lake or Streambed Alteration Agreement will be prepared. Such an agreement typically stipulates that certain measures will be implemented to protect the habitat values of the lake or drainage in question.

3.3 Potentially Significant Project-Related Impacts and Mitigation

Species identified as candidate, sensitive, or special status species in local or regional plans policies or regulations by CDFW or the USFWS that have the potential to be impacted by the Project are identified below with corresponding mitigation measures.

3.3.1 General Mitigation Measures

Prior to the start of construction, all personnel associated with construction of the Project shall be trained to be able to identify these candidate, sensitive, or special status species in order to prevent impacts to sensitive resources; therefore, the following general mitigation measures shall be implemented:

> ***Mitigation Measure 3.3.1a (WEAP Training):*** Prior to initiating construction activities (including staging and mobilization), all personnel associated with Project construction shall attend mandatory Worker Environmental Awareness Program (WEAP) training, conducted by a qualified biologist, to aid workers in identifying special status resources that may occur in the Project area. The specifics of this program shall include identification of the sensitive species and suitable habitats, a description of the regulatory status and general ecological characteristics of sensitive resources, and review of the limits of construction and mitigation measures required to reduce impacts to biological resources within the work area. A fact sheet conveying this information, along with photographs or illustrations of sensitive species with potential to occur onsite, shall also be prepared for distribution to all contractors, their employees, and all other personnel involved with construction of the Project. All employees shall sign a form documenting that they have attended WEAP training and understand the information presented to them.
>
> ***Mitigation Measure 3.3.1b (Construction Operational Hours):*** Construction shall be conducted during daylight hours to reduce disturbance to wildlife that could be foraging within work areas.

3.3.2 Project-Related Mortality and/or Disturbance of Nesting Raptors, Migratory Birds, and Special Status Birds (Including Tricolored Blackbird and Swainson's Hawk)

The Project site contains suitable foraging habitat for several avian species, including the Swainson's hawk, and large cottonwood trees along the banks of Deer Creek provide suitable nesting habitat. Various birds could nest within the adjacent orchard habitat, dairy-forage fields, or riparian corridor, and ground-nesting birds, such as the killdeer could nest on the bare ground of the dirt roads or fallow fields onsite. Although the Project does not include the removal of any trees, raptors and migratory birds nesting within the Project site could be injured or killed by Project activities. Furthermore, construction activities could disturb birds nesting within or adjacent to work areas, resulting in nest abandonment. Project construction activities that adversely affect the nesting success of raptors and migratory birds or result in the mortality of individual birds constitutes a violation of State and federal laws and is considered a significant impact under CEQA and NEPA.

Although not observed during the field survey, Swainson's hawks are relatively common in this portion of the Central Valley, and there are potential nest trees and suitable foraging habitat within and adjacent to Project areas. It is possible that Swainson's hawks could at least pass over the Project area. In the event that a Swainson's hawk or other avian species is foraging within the Project site during construction activities, the individual would be expected to fly away from disturbance they encounter, subsequently eliminating the risk of injury or mortality while foraging.

Tricolored blackbirds' nest in large colonies and often prefer thickets of cattails or dense riparian vegetation along freshwater ponds near suitable foraging grounds. Given the scarcity of remaining wetlands and natural habitat in the Central Valley, tricolored blackbirds are frequently observed nesting within dairy farm forage fields. They tend to prefer silage fields comprised of triticale and/or alfalfa, and both of these varieties were prevalent along the proposed Lateral 4 canal alignment. Several known nesting colonies of tricolored blackbird have been observed and monitored in the vicinity of the Project, and these colonies demonstrate site fidelity by returning to the same triticale fields adjacent to dairies for breeding yearly (Colibri 2017 and 2018). During the biological survey, red-winged blackbird colonies were observed within silage fields along the proposed Lateral 4 alignment.

Nesting tricolored blackbird colonies are known to form up to 100,000 nests, and approximately 86% of the global population of this species is found in the San Joaquin Valley (Weintraub, et al. 2016). For this reason, disturbance or mortality of just one nesting colony can significantly impact tricolored blackbird populations. For over two decades, a major component of tricolored blackbird conservation efforts have been focused on silage buy-outs and/or harvest delays involving monetary compensation to landowners of fields occupied by tricolored blackbird colonies. In the case of silage buy-out, the farmer agrees to wait until all of the birds have departed and are completely independent of the field. In harvest delay, the farmer agrees to delay the harvest just until the young of fledged. (Meese 2009).

Project activities taking place in the vicinity of silage fields and occurring with avian nesting season could potentially impact a breeding colony or colonies of tricolored blackbird, which would be considered a significant impact under CEQA and NEPA. Breeding colonies could be directly impacted by project activities in that individual birds could be injured or killed by equipment during construction, and nests could be destroyed. Potential indirect impacts to this species includes disturbance to nesting colonies which could result in nest abandonment. Foraging colonies may also be encountered within silage fields. However, a foraging colony within or adjacent to Project activities would not be expected to sustain injuries or mortality, as they would likely fly away from disturbance.

The Project does not involve the removal of any trees or shrubs, but the proposed Lateral 4 canal alignment will cross through two silage fields and one fallow field. Furthermore, depending on the chosen location of the basin, another portion of a silage field may be permanently impacted. However, the silage fields within proposed impact areas have not historically contained breeding colonies of tricolored blackbirds and the loss of a small section of habitat within an expanse of silage fields would not be considered significant. The introduction of a canal and basin filled with fresh water could potentially increase habitat suitability for riparian birds, such as the tricolored blackbird. Since the Project does not propose removal of trees or shrubs, there will be minimal-to-no impact to nesting habitat for most avian species, and impacts to foraging habitat would be minor, given the expanse of silage fields, ruderal-annual grassland, and fallow fields in the vicinity. For these reasons, loss of nesting and/or foraging habitat would not be considered a potentially significant impact under CEQA and NEPA.

Nesting bird season is generally accepted as February 1 through August 31; however, Swainson's hawk nesting season is generally accepted as March 1 through September 15. For simplicity, these timeframes have been combined.

Implementation of the following measures, will reduce potential impacts to nesting raptors, migratory birds, and most special status birds, including Swainson's hawk to a less than significant level under CEQA and NEPA, and will ensure compliance with State and federal laws protecting these avian species. These mitigation measures were derived and adapted from CDFW's *Staff Guidance Regarding Avoidance of Impacts to Tricolored Blackbird Breeding Colonies on Agricultural Fields* (2015), CDFW's *Staff Report Regarding Mitigation for Impacts to Swainson's Hawks (Buteo swainsoni) in the Central Valley of California* (1994), and the Swainson Hawk Technical Advisory Committee's *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in*

California's Central Valley (2000). Avian species requiring additional protective measures will be discussed in detail in the following sections.

Mitigation. The following measures will be implemented prior to the start of construction:

> ***Mitigation Measure 3.3.2a (Avoidance):*** The Project's construction activities shall occur, if feasible, between September 16 and January 31 (outside of nesting bird season) in an effort to avoid impacts to nesting birds.
>
> ***Mitigation Measure 3.3.2b (Pre-construction Survey):*** If activities must occur within nesting bird season (February 1 to September 15), a qualified biologist shall conduct pre-construction surveys for active nests and breeding colonies within 30 days prior to the start of construction. The survey shall include the proposed work area and surrounding lands within 0.5 mile. If no active nests or breeding colonies are observed, no further mitigation is required. Raptor nests are considered "active" upon the nest-building stage.
>
> ***Mitigation Measure 3.3.2c (Establish Buffers):*** On discovery of any active nests or breeding colonies near work areas, the biologist shall determine appropriate construction setback distances based on applicable CDFW and/or USFWS guidelines and/or the biology of the species in question. Specifically, a 300-foot disturbance-free buffer shall be implemented around breeding colonies of tricolored blackbird, and a 0.5-mile disturbance-free buffer shall be implemented around active Swainson's hawk nests. Construction buffers shall be identified with flagging, fencing, or other easily visible means, and shall be maintained until the biologist has determined that the nestlings have fledged.

3.3.3 Project-Related Mortality and/or Disturbance of Burrowing Owl

At the time of the biological survey, several burrowing owls were observed flushing from burrows within and adjacent to Project areas, [redacted] Burrowing owls (*Athene cunicularia*) were once considered abundant in California, but populations have been declining, and are now classified as a Species of Special Concern in California. Burrowing owls breed in open grasslands and a variety of human-modified habitats with similar features. They are typically found within ground squirrel burrows in prairies, low-growing agricultural fields, airports, and golf courses. 12 % of the State's population resides in the southern Central Valley region, with the highest concentrations in Tulare and Kern Counties (Wilkinson and Siegel, 2010). Approximately 30% of breeding sites are located along irrigation canals, 10% are found within fallow fields, and 10% are found within field crops (Wilkerson and Siegel, 2010). Nesting burrowing owls are found at low elevations, in open areas with few trees or other raptor perching sites. They prefer low-growing vegetation around burrows and are attracted to soil disturbance, especially from ground squirrels. Most burrowing owls are migratory, but many in California, especially within the Central Valley region, are year-round residents. Those that do migrate often exhibit site fidelity and will return to the same burrow locations year after year.

All of the active burrowing owl burrows observed during the field survey were located along the banks of canals or other man-made water features. Burrows were comprised of ground squirrel burrows and erosion gullies. In most cases, large ground squirrel populations were present within the areas occupied by the owls. All of the owls encountered seemed fairly tolerant of human-disturbance, as an average flushing distance of approximately 20 feet was noted.

The first burrowing owl observation included a burrowing owl flushing from a burrow within an erosion gully along the bank of a dairy lagoon, [redacted] Upon inspection, the entrance of the burrow contained decorative debris, feathers, and whitewash. The entire interior of the burrow was visible and therefore not suitable for successful breeding. A single owl was observed at this location. No eggs or young were present within the burrow. However, there were several additional ground squirrel burrows and deep erosion gullies in the vicinity which could house nesting owls. It is possible the burrow that the owl was observed flushing from was merely a satellite burrow.

The second owl encountered was observed standing at the entrance of a burrow near top of bank along a canal, [redacted] This owl flushed into an adjacent dairy-forage field when approached. Upon inspection, the burrow was comprised of a ground squirrel burrow and decorative debris, feathers, whitewash, and pellets were visible around the entrance. A single owl was observed at this location.

While surveying the potential site [redacted] several burrowing owl pairs were observed. [redacted] The bank was surveyed from east to west, [redacted] The first burrow encountered resulted in a pair of burrowing owls flushing into the adjacent dairy forage field. [redacted] No owls were seen flushing from this burrow, but the burrow had decorative debris and prey remnants around the entrance.

Burrowing owls are not only known to occur within Project areas, but several individuals and potentially breeding pairs were observed during the biological survey. The Project involves excavation and ground-disturbance associated with the development of a canal and basin. If burrowing owls were nesting at the time of ground disturbance, individuals could be injured or killed by burrow collapse. Project-related construction in the vicinity could also disturb nesting owls, causing a breeding pair to abandon their nest. Project activities resulting in injury or mortality of burrowing owl individuals or that adversely affect nesting success would be considered a significant impact under CEQA and NEPA. Wintering owls in the vicinity would be expected to fly away from disturbance, but given their fossorial nature, extra care should be taken to ensure protection of this species prior to ground disturbance. Removal of active burrows could be considered a significant impact if there were not an abundance of alternative suitable burrows in the Project's vicinity. Furthermore, the Project proposes development of an additional canal and basin, which would provide additional suitable habitat once the banks are colonized by the prevalent ground squirrel population.

Implementation of the following measures, derived from the CDFW 2012 *Staff Report on Burrowing Owl Mitigation,* will reduce potential impacts to burrowing owls to a less than significant level, and will ensure compliance with State and federal laws protecting this species.

> ***Mitigation Measure 3.3.3a (Pre-construction Take Avoidance Survey):*** A qualified biologist shall conduct a pre-construction take avoidance survey for burrowing owls and suitable burrows, in accordance with CDFW's *Staff Report on Burrowing Owl Mitigation* (2012), within 30 days prior to the start of construction activities. The survey shall include the proposed work area and surrounding lands within 500 feet. If no burrowing owl individuals or suitable burrows are observed, no further mitigation is required.

> ***Mitigation Measure 3.3.3b (Avoidance):*** If an active burrowing owl burrow is detected, the occurrence shall be reported to the local CDFW office and the CNDDB, and disturbance-free buffers shall be implemented in accordance with CDFW's 2012 *Staff Report on Burrowing Owl Mitigation,* as outlined in the table below:

Location	Time of Year	Level of Disturbance		
		Low	Medium	High
Nesting sites	April 1 – August 15	200 meters	500 meters	500 meters
Nesting sites	August 16 – October 15	200 meters	200 meters	500 meters
Nesting sites	October 16 – March 31	50 meters	100 meters	500 meters

> ***Mitigation Measure 3.3.3c (Consultation with CDFW and Passive Relocation):*** If avoidance of an active burrowing owl burrow is not feasible, CDFW shall be immediately consulted to determine the best course of action, which may include passive relocation during non-breeding season. Passive

relocation and/or burrow exclusion shall not take place without coordination with CDFW and preparation of an approved exclusion and relocation plan.

3.3.4 Project-Related Mortality and/or Disturbance of Mountain Plover and Western Snowy Plover

The mountain plover does not breed in California, but the Project area is located within the historic and current wintering range of this species. Mountain plovers typically arrive on California wintering grounds in mid-October and return back to breeding grounds in March (Knopf and Rupert 1995). The most recent observation of this species in Tulare County was a flock of 645 plovers in the winter of 2005, just south of Allensworth (Shuford and Gardali, 2008), which is approximately 7 miles southwest of the Project area. From data collected at 63 sites across California, Hunting et al. (2001) found that wintering plovers most frequently used fallow, grazed, or burned sites with low-growing vegetation. Knopf and Rupert (1995) concluded that wintering plovers are forced to use cultivated lands for roosting and foraging as a result of loss of native grassland habitat. It is highly unlikely that a nesting mountain plover would be encountered within Project areas, but a wintering flock could potentially occur within a fallow field in the vicinity. In the unlikely event that a transient or injured mountain plover were breeding in Project areas, mitigation measures 3.3.2a through 3.3.2c provide protection for nesting birds, including the special status mountain plover. If a mountain plover individual or flock were using Project areas as wintering grounds, they would likely fly away from Project-related disturbance, avoiding potential mortality or injury.

The Project is located within the historic and current breeding range of the interior population of the western snowy plover. Loss of wetland and alkaline lake habitat in the Tulare Basin has had a substantial effect on nesting plovers. In the Central Valley, nesting habitat for this species now consists primarily of agricultural evaporation ponds and sewage ponds. Some western snowy plovers reside year-round within the Central Valley and some migrate to the California coasts for winter. Although an observation of this species has not been recorded in the vicinity of the Project in over 25 years, the dairy lagoons and basins onsite provide suitable nesting habitat. If a western snowy plover were nesting in the vicinity, an individual could be killed or injured, or could be disturbed, resulting in nest abandonment. Project activities that adversely affect nesting success or result in mortality of western snowy plovers would violate State and federal laws and would be considered a significant impact under CEQA and NEPA. Wintering individuals or flocks would be expected to fly away from Project-related disturbance, avoiding potential mortality and injury outside of nesting season. Nesting snowy plovers would be protected by mitigation measures 3.3.2a through 3.3.2c.

Implementation of mitigation measures 3.3.2a through 3.3.2c will reduce potential impacts to mountain plovers and western snowy plovers to a less than significant level under CEQA and NEPA, and will ensure compliance with State and federal laws protecting these avian species. No additional species-specific mitigation measures are required to provide adequate protection of special status plovers.

3.3.5 Project-Related Mortality and/or Disturbance of Burrowing Mammals (American Badger and San Joaquin Kit Fox)

General mitigation measure BIO-3.3.1a (WEAP Training) requires all construction personnel to attend a mandatory education program, which will include a detailed description of the San Joaquin kit fox and American badger and associated habitat requirements, color photographs or illustrations, an explanation of the conservation status of these species and coverage under State and federal regulations, penalties for violating said regulations, and a list of required measures to reduce impacts to these species during construction. General mitigation measure BIO-3.3.1b (Construction Operational Hours) limits construction activities to daylight hours which would reduce the likelihood of encountering a kit fox or American badger onsite.

Implementation of the following measures, derived from the USFWS 2011 *Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance,* will further reduce potential impacts to the San Joaquin kit fox and American badger to a less than significant level, and will ensure compliance with State and federal laws protecting these species.

Mitigation Measure 3.3.5a (Pre-construction Burrow Survey): Within 30 days prior to the start of construction, a pre-construction survey for San Joaquin kit fox and American badger individuals and suitable burrows shall be conducted on and within 200 feet of proposed work areas. Any burrows within the survey area that are determined to be suitable for use by the San Joaquin kit fox or American badger shall be monitored for a period of three days using tracking medium and/or remotely-triggered cameras. If an active kit fox or American badger den is detected within or adjacent to the Project area, construction will be delayed, and CDFW and USFWS shall be consulted to determine the best course of action.

Mitigation Measure 3.3.5b (Minimization): The Project shall observe all minimization and protective measures from the Construction and On-Going Operational Requirements of the USFWS 2011 *Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance*, including, but not limited to: construction speed limits, covering of pipes, installation of escape structures, restriction of herbicide and rodenticide use, proper disposal of food items and trash, prohibition of pets and firearms, and completion of an employee education program.

Mitigation Measure 3.3.5c (Mortality Reporting): The Sacramento Field Office of USFWS and the Fresno Field Office of CDFW will be notified in writing within three working days in the case of the accidental death or injury to a San Joaquin kit fox or American badger during construction. Notification must include the date, time, and location of the incident and any other pertinent information.

3.3.6 Project-Related Mortality and/or Disturbance of Special Status Reptiles (Blunt-nosed Leopard Lizard, Bakersfield Legless Lizard, Coast Horned Lizard, and Western Spadefoot)

The disturbed habitats of the Project areas are generally unsuitable for these special status reptiles and amphibians. However, seasonal and ephemeral pools within and adjacent to the Project provide marginal breeding habitat for the western spadefoot, and the abundance of rodent burrows could serve as aestivation habitat. There are several recorded observations of blunt-nosed leopard lizard, Bakersfield leopard lizard, and coast horned lizard in the vicinity of the Project. Most of the recorded observations are confined to wildlife refuges and conservation areas, such as Pixley National Wildlife Refuge and Allensworth Ecological Reserve. However, an individual could conceivably pass through or inhabit Project areas.

Legless lizards are often found in moist soils near intermittent drainages, and therefore the channel of Deer Creek represents suitable habitat for this species. A western spadefoot could use a variety of shallow water features in the vicinity as breeding habitat and an abundance of rodent burrows throughout Project areas represent suitable aestivation habitat for several species of reptiles and amphibians. The majority of the proposed Lateral 4 canal alignment is confined to barren, compacted dirt roads. If a special status reptile were basking along the dirt road during ingress/egress of vehicles or equipment, or ground disturbance associated with grading and excavation, an individual could be injured or killed by Project-related activities. If a special status amphibian were breeding within roadside ephemeral or seasonal pools or one of the many irrigation basins in the vicinity, an individual could be injured or killed by construction activities during dispersal movements. Projects that result in the mortality of special status species are considered a violation of State and federal laws and are considered a potentially significant impact under CEQA and NEPA.

Implementation of the following measure will reduce potential impacts to special status reptiles and amphibians to a less than significant level under CEQA and NEPA, and will ensure compliance with State and federal laws protecting these species.

Mitigation. The following measure will be implemented prior to the start of construction:

Mitigation Measure 3.3.6a (Pre-construction Survey): A qualified biologist will perform a pre-construction survey for special status reptiles and amphibians with potential to occur onsite (blunt-nosed leopard lizard, Bakersfield legless lizard, coast horned lizard, and western spadefoot) within 30 days prior to the start of construction. The survey will cover all Project areas, including ingress/egress routes, staging areas, and 500-foot radius. If no special status reptiles or amphibians are observed, construction may begin. If special status reptiles and/or amphibians are observed during the pre-construction survey, all construction activities shall be delayed, and CDFW shall be consulted to determine the best course of action.

3.4 Less Than Significant Project-Related Impacts

3.4.1 Project-Related Impacts to Special Status Plant Species

16 special status plant species have been documented in the Project vicinity, including alkali mariposa-lily (*Calochortus striatus*), brittlescale (*Atriplex depressa*), California alkali grass (*Puccinellia simplex*), California jewelflower (*Caulanthus californicus*), Coulter's goldfields (*Lasthenia glabrate ssp. coulteri*), Earlimart orache (*Atriplex cordulata var. erecticaulis*), Kern mallow (*Eremalche parryi spp. kernensis*), lesser saltscale (*Atriplex miniscula*), Lost Hills crownscale (*Atriplex coronata var. vallicola*), recurved larkspur (*Delphinium recurvatum*), San Joaquin adobe sunburst (*Pseudobahia peirsonii*), San Joaquin woollythreads (*Monolopia congdonii*), slough thistle (*Cirsium crassicaule*), spiny-sepaled button-celery (*Eryngium spinosepalum*), subtle orache (*Atriplex subtilis*), and vernal pool smallscale (*Atriplex persistens*). As explained in **Table 2**, all of the aforementioned plant species are either absent from or unlikely to occur within the Project area due to past and ongoing disturbance and/or the absence of suitable habitat. Therefore, the implementation of the Project will have no effect on individual plants or regional populations of these special status plant species. Mitigation measures are not warranted.

3.4.2 Project-Related Impacts to Special Status Animal Species Absent From, or Unlikely to Occur on, the Project Site

Of the 22 regionally occurring special status species, 10 are considered absent from or unlikely to occur within the Project area due to past or ongoing disturbance and/or absence of suitable habitat. As explained in **Table 1**, the following species were deemed absent from the Project area: California red-legged frog *(Rana draytonii*), Delta smelt (*Hypomesus transpacificus*), giant gartersnake (*Thamnophis gigas*), Kern brook lamprey (*Entosphenus hubbsi*), Tulare grasshopper mouse (*Onchomys torridus tularensis*); and the following species were deemed unlikely to occur within the Project area: conservancy fairy shrimp (*Branchinecta conservation*), fulvous whistling-duck (*Dendrocygna bicolor*), Nelson's antelope squirrel (*Ammospermophilus nelsoni*), San Joaquin coachwhip (*Masticophis flagellum ruddocki*), and Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*). Therefore, implementation of the Project will have no impact on these 10 special status species through construction mortality, disturbance, or loss of habitat. Mitigation measures are not warranted.

3.4.3 Project-Related Impacts to Jurisdictional Waters, Wetlands, Navigable Waters, Wild and Scenic Rivers, or other Water Features, and Riparian Habitat

Deer Creek could potentially be considered a water of the United States and therefore under the jurisdiction of the USACE. A formal aquatic resources delineation has not been conducted and USACE has not been contacted regarding a jurisdictional determination of these waters. However, in a letter dated May 27, 2015 (SPK-2015-00265), in an approved jurisdictional determination, USACE determined an upstream portion of Deer Creek to be an intrastate isolated water with no apparent interstate or foreign commerce connection, and therefore not regulated by USACE. Although it should be confirmed with USACE regulatory staff, it may be reasonable to assume that the portion of Deer Creek that passes through the Project area is also not a jurisdictional water.

The Project does not propose removal of trees, shrubs, or vegetation along the Deer Creek riparian corridor. Construction in that area would be confined to modifications of the existing check structure. However, work within the channel of Deer Creek would require a Notification of Lake or Streambed Alteration (LSA) be submitted to CDFW pursuant to Section 1601 and 1602 of the California Fish and Game Code. If CDFW determines that the activity may adversely affect fish and wildlife resources, a Lake or Streambed Alteration Agreement will be prepared. Such an agreement typically stipulates that certain measures will be implemented to protect the habitat values of the lake or drainage in question.

The only water features present along the proposed Lateral 4 canal alignment are man-made irrigation basins, ditches, and canals. None of the water features in any of the Project areas are classified as wild and scenic rivers or traditionally navigable waters. Although some seasonally ponded areas were observed within agricultural lands adjacent to the proposed Lateral 4 alignment, no features of traditional wetlands were observed. Therefore, implementation of the Project will have no impact on the aforementioned biological resources. Mitigation measures are not warranted.

3.4.4 Project-Related Impacts to Wildlife Movement Corridors

As discussed in **Section 2.7**, portions Project areas along Deer Creek could function marginally as a wildlife movement corridor. Construction activities may temporarily disrupt movement along this potential corridor; however, construction will be temporary, short-term in duration, and limited to daylight hours. After the construction phase of the Project is complete, potential movement corridors along Project areas will function normally. The remainder of the Project areas along the proposed Lateral 4 alignment do not contain any features that would be likely to function as wildlife movement corridors. Furthermore, the Project is located in a region often disturbed by intensive agricultural cultivation practices and human disturbance which would discourage dispersal and migration. Therefore, Project-related impacts to wildlife movement corridors would be considered less than significant under CEQA and NEPA. Mitigation is not warranted.

3.4.5 Project-Related Impacts to Critical Habitat

Designated critical habitat is absent from the Project area and surrounding lands. Therefore, there will be no impact to critical habitat, and mitigation is not warranted.

3.4.6 Local Policies or Habitat Conservation Plans

Proposed Project design appears to be consistent with the goals and policies of the Tulare County General Plan. There are no known habitat conservation plans in the Project vicinity. Mitigation is not warranted.

3.4.7 Coastal Zone and Coastal Barriers Resources Act

The Project is not located within the coastal zone. The Project will not impact or be located within or near the Coastal Barrier Resources System or its adjacent wetlands, marshes, estuaries, inlets, and near-shore waters. Mitigation is not warranted.

3.4.8 Project-Related Impact to Essential Fish Habitat

Essential Fish Habitat (EFH) and Habitat Areas of Particular Concern (HAPC) are absent from the Project area and surrounding lands, and consultation with the National Marine Fisheries (NMFS) Service will not be required. Query results of the NMFS EHF Mapper can be found in **Appendix D** at the end of this document. Mitigation is not warranted.

3.5 Section 7 Determination

In addition to the effects analysis performed in Sections 2 and 3 of this document, **Table 3** summarizes Project effect determinations for Federally Listed Species found on the USFWS IPaC list generated on March 12, 2019 (**Appendix C**), in accordance with Section 7 of the Endangered Species Act.

Table 3. Section 7 Determinations

Species	Determination	Rationale for Determination
San Joaquin kit fox (*Vulpes macrotis mutica*)	**May affect, not likely to adversely affect**	Habitat marginal. Most observations in the vicinity are over 25 years old. The Project will implement the USFWS *Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to Ground Disturbance* (1999).
Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*)	**May affect, not likely to adversely affect**	Habitat marginal. Most observations in the vicinity are over 25 years old.
blunt-nosed leopard lizard (*Gambelia sila*)	**May affect, not likely to adversely affect**	Habitat marginal. A qualified biologist will conduct pre-construction surveys prior to construction activities.
giant gartersnake (*Thamnophis gigas*)	**No effect**	Habitat absent. Project area is outside of the known distribution range of this species.
California red-legged frog (*Rana draytonii*)	**No effect**	Habitat absent. Project area is outside of the known distribution range of this species.
Delta smelt (*Hypomesus transpacificus*)	**No effect**	Habitat absent. Perennial water features are absent, and the Project is outside of the known distribution range of this species. There are no downstream tributaries of Deer Creek; therefore, there will be no potential for downstream effects.
conservancy fairy shrimp (*Branchinecta conservatio*)	**No effect**	Habitat marginal, at best. There have been no recorded observations in the vicinity.
vernal pool fairy shrimp (*Branchinecta lynchi*)	**No effect**	Habitat marginal, at best. Most observations in the vicinity are over 25 years old.

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Appendix A. Selected Photographs of the Project Site

Photograph 1: Deer Creek check structure.

Photograph 2: Burrows along the banks of Deer Creek.

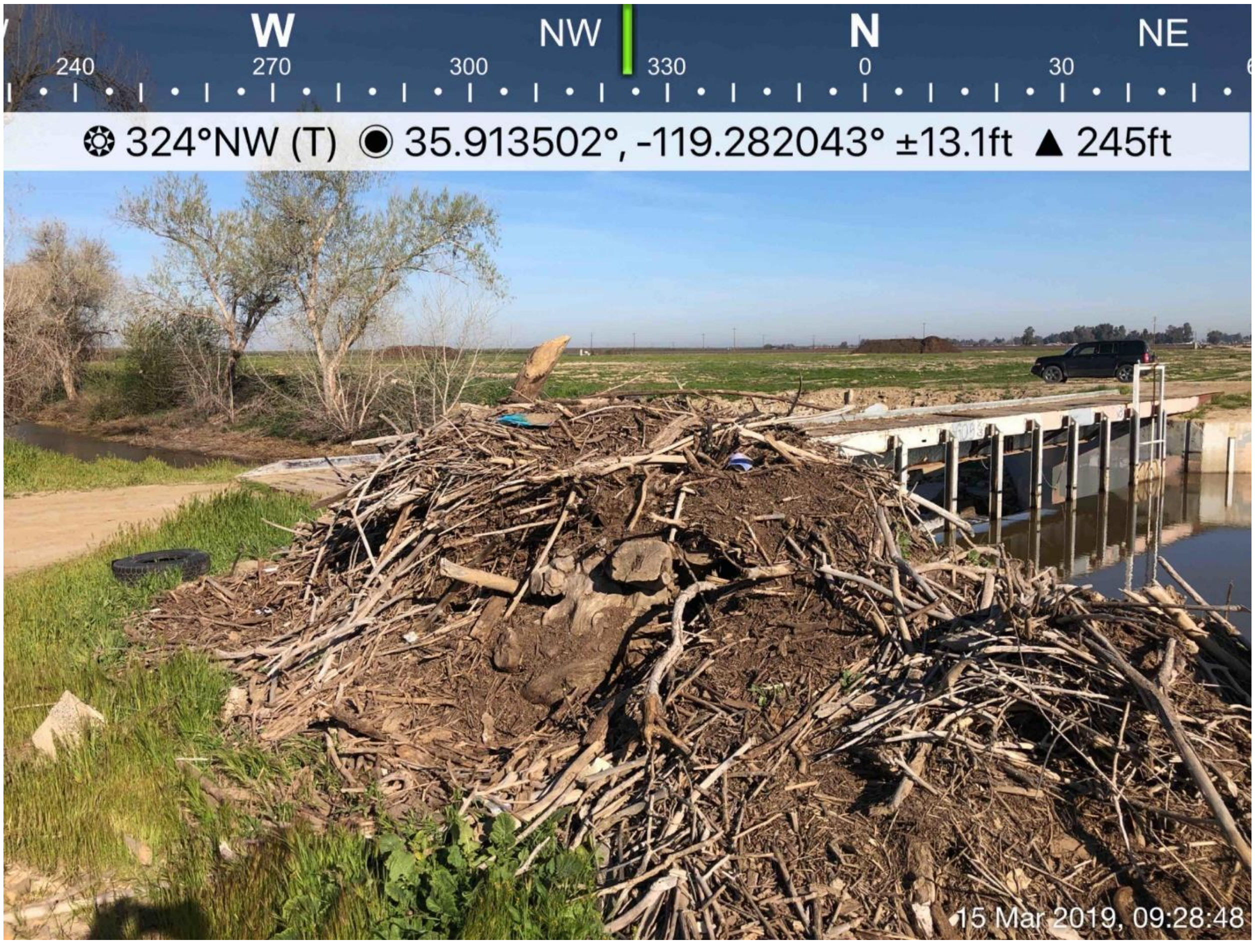
Photograph 3: Rip rap along the banks of Deer Creek. Burrows and a ground squirrel population was present.

Photograph 4: Overview of the Deer Creek channel and both banks, facing west, from the check structure.

Photograph 5: North bank of Deer Creek east of the check structure.

Photograph 6: South bank of Deer Creek east of the check structure.

Photograph 7: Overview of the channel and both banks of Deer Creek facing east from the check structure. The Union Pacific Railroad is visible to the east and State Route 99 is visible further east in the background.



Photograph 8: Several piles of debris (like the one pictured) were present along both banks of Deer Creek.

Photograph 9: Irrigation canal north of Deer Creek.

Photograph 10: Several large burrows (like the one pictured) were present along the banks of Deer Creek. A prevalent ground squirrel population was observed.

Photograph 11: Burrows were observed beneath the Deer Creek check structure bridge.

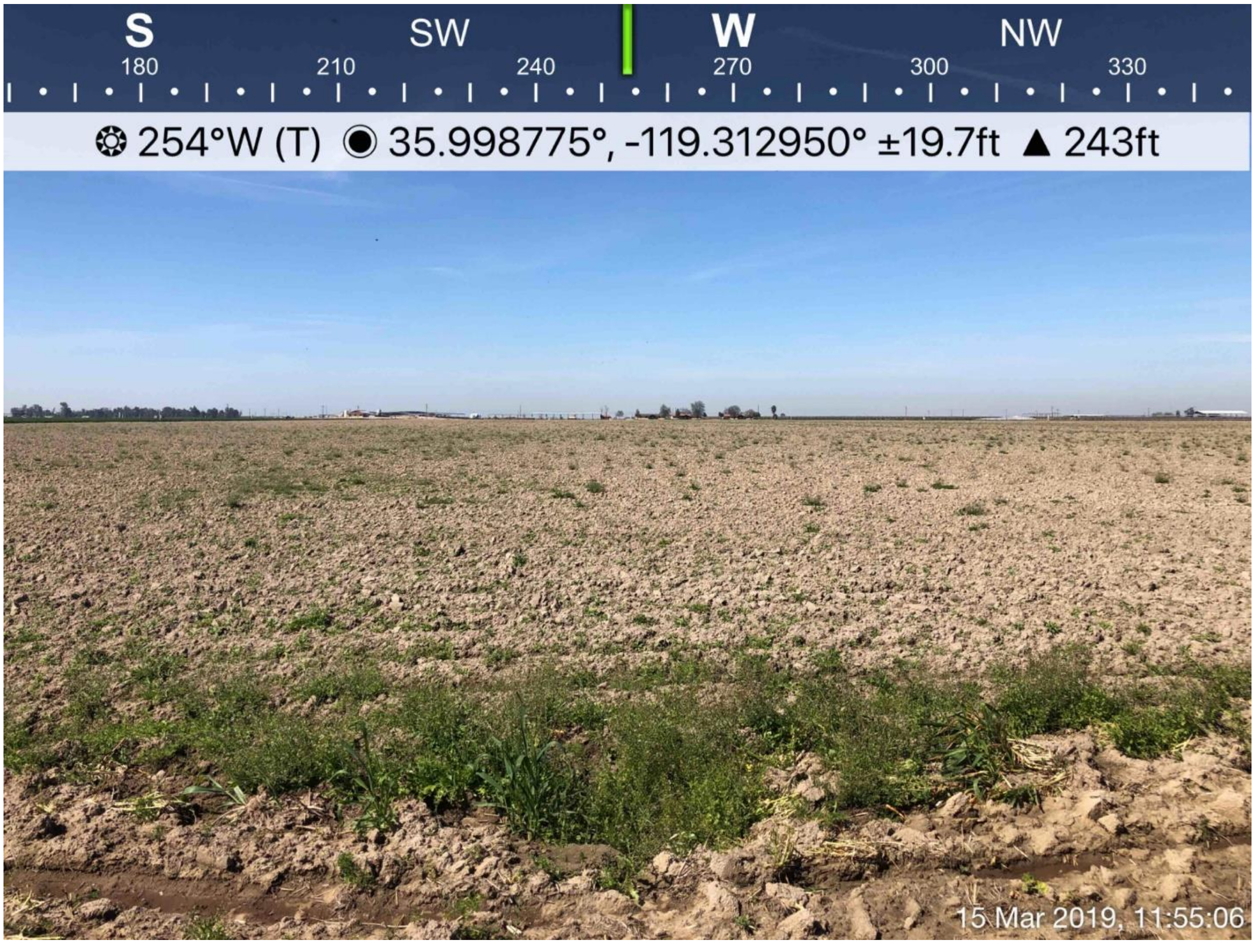
Photograph 12: Location of the southeast terminus of the proposed Lateral 4 canal alignment. The Lateral 4 canal would connect to the existing West Main canal (pictured) and travel north, through the dairy-forage field (pictured).

Photograph 13: Overview of dairy-forage field.

Photograph 14: Overview of the north-south stretch of the proposed Lateral 4 canal alignment along compacted dirt road.

Photograph 15: Irrigation basin adjacent to proposed Lateral 4 canal alignment. California toads and a great egret were observed.

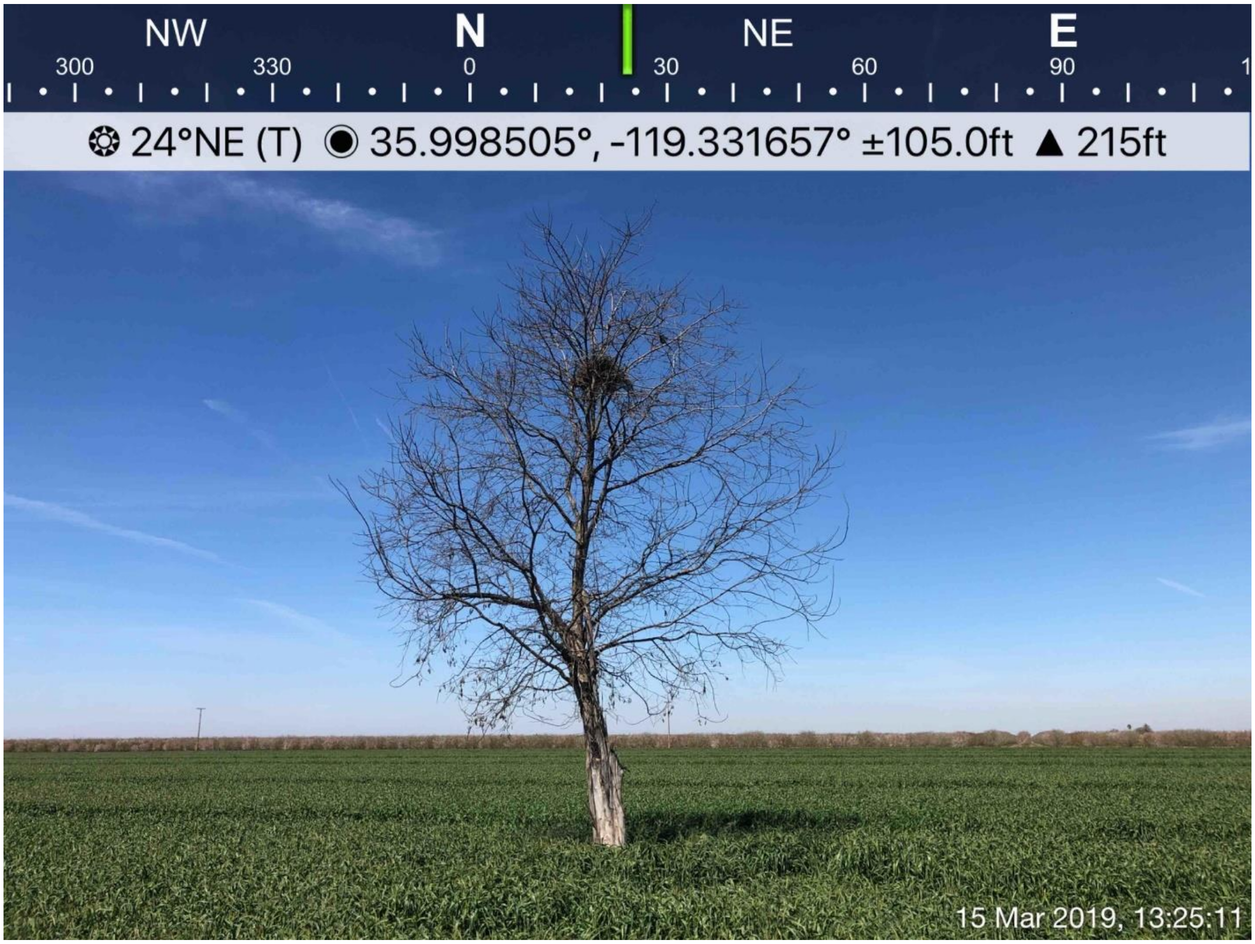
Photograph 16: Several areas along the proposed Lateral 4 canal alignment showed signs of recent ground-disturbance, like this recently excavated trench.



Photograph 17: Fallow field along proposed Lateral 4 canal alignment.

Photograph 18: Dry excavated basin northeast of the proposed Lateral 4 canal alignment. An abundance of burrows, ground squirrels, and San Joaquin fence lizards were present.

Photograph 19: Overview of east-west stretch of proposed Lateral 4 canal alignment along a compacted dirt road, surrounded by dairy-forage fields.



Photograph 20: Active red-tailed hawk nest within the canopy of a singular large deciduous tree growing out of a forage field.

Photograph 21: Seasonally ponded area within a dairy-forage field along the proposed Lateral 4 canal alignment.

Photograph 22: [redacted] An active burrowing owl burrow was observed along the southeastern bank. Waterfowl, shorebirds, and waders were observed within this lagoon and swallows were found to be nesting within erosion gullies along the southern bank.

Photograph 23: Active burrowing owl burrow [redacted] pictured in photograph 22. One adult burrowing owl was observed flushing from this burrow at the time of the field survey. Decorative debris, feathers, and whitewash were present at the entrance of the burrow. However, the entire interior of the burrow was visible and therefore not suitable for successful breeding. No eggs or young were present within the burrow. There were several additional ground squirrel burrows and deep erosion gullies in the vicinity which could house nesting owls. It is possible this burrow is merely a satellite burrow or used as temporary refugia.

Photograph 24: Burrowing owl [redacted]

Photograph 25: Large burrow in dairy lagoon.

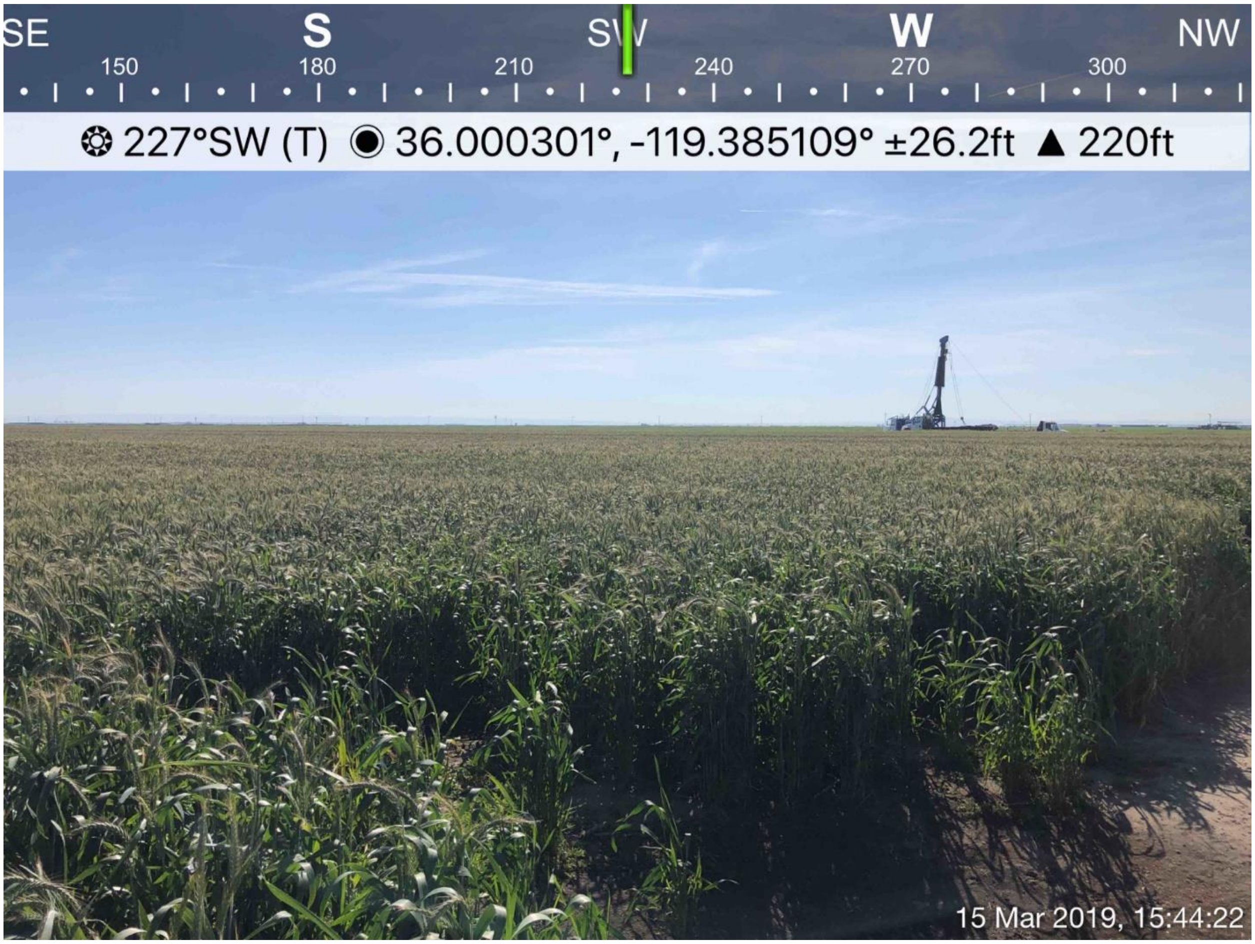
Photograph 26: Overview of proposed Lateral 4 canal alignment along compacted dirt road. Photo was taken from Road 96.

Photograph 27: Dairy ponds adjacent to the proposed Lateral 4 canal alignment, west of Road 96. Waterfowl, shorebirds, and waders were observed.

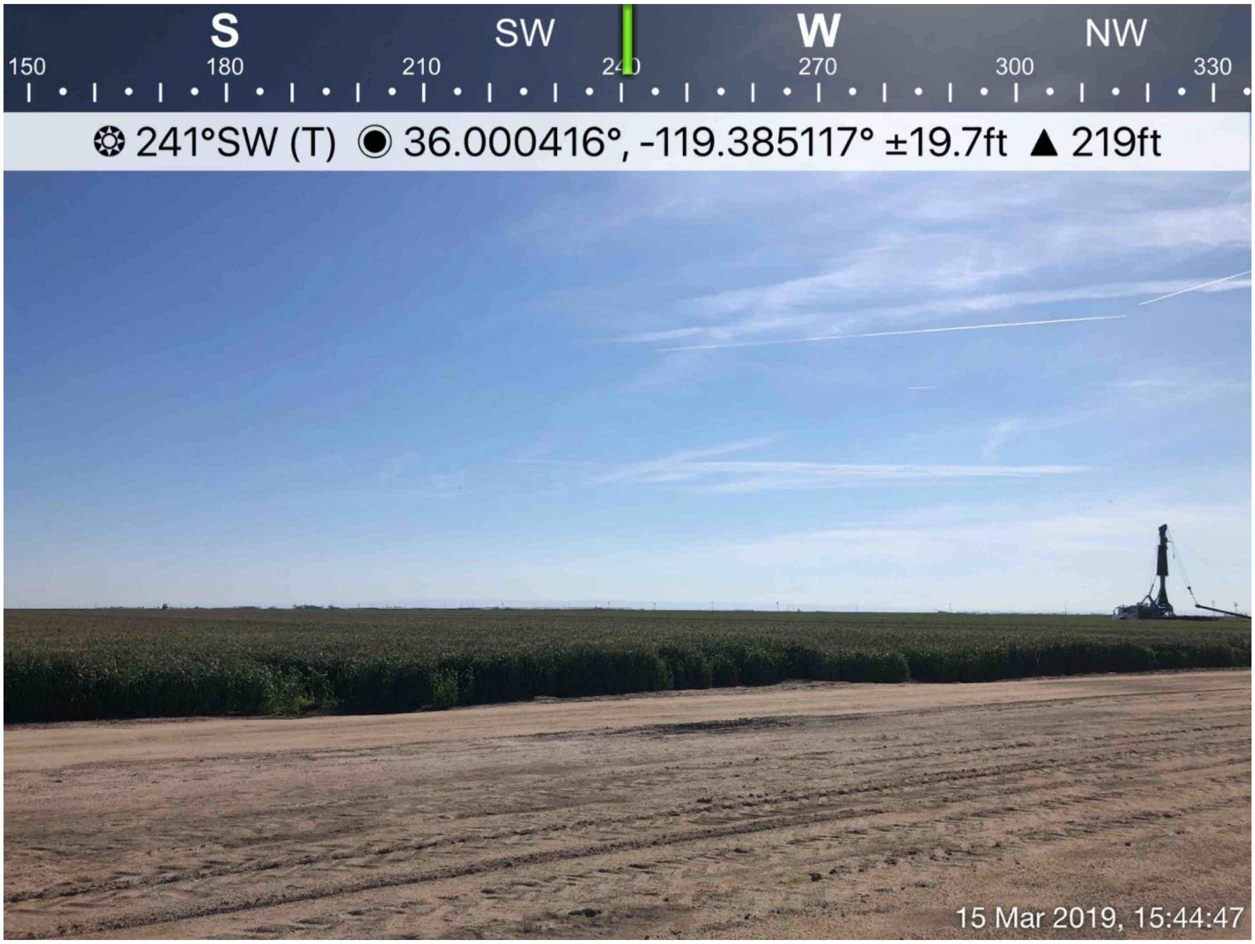
Photograph 28: Ground disturbance in Project areas.

Photograph 29: Seasonally ponded area and a pile of tires adjacent to the proposed Lateral 4 canal alignment, west of Road 96.

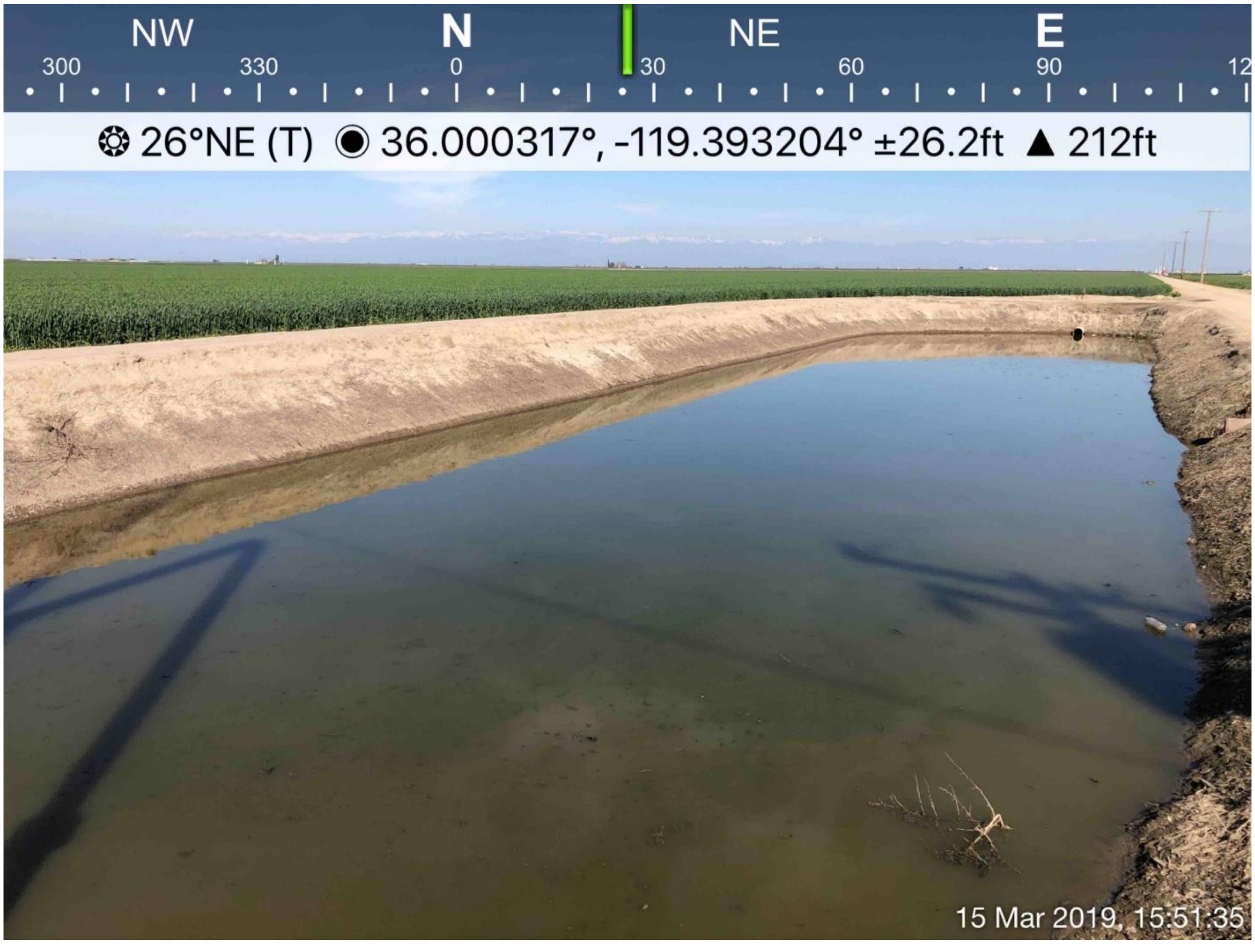
Photograph 30: Extensive ground disturbance was present throughout the proposed Lateral 4 canal alignment.



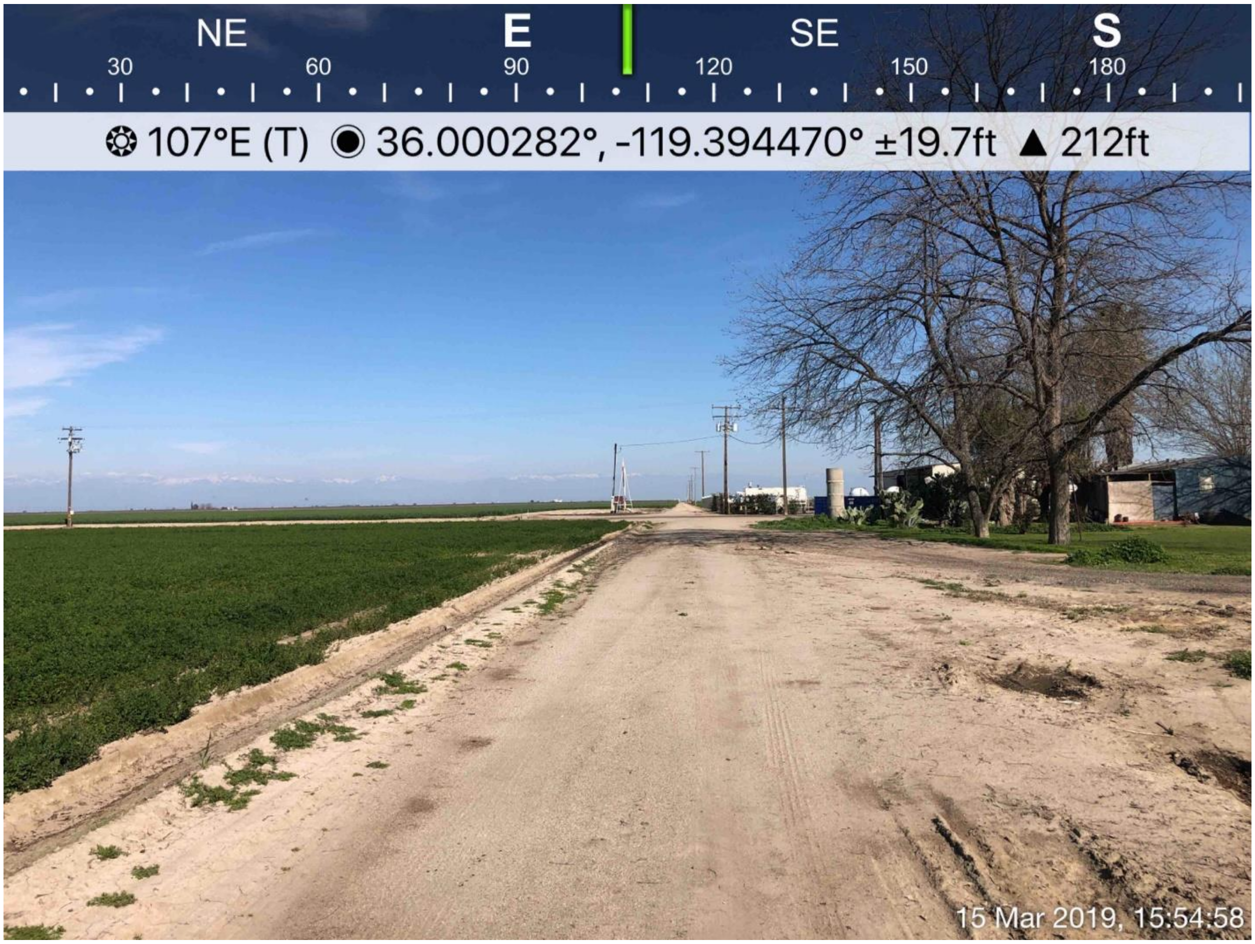
Photograph 31: Overview of proposed location of Road 84 basin. If the Project chooses this location for the basin, a portion of this forage field would be cleared and excavated into a basin which would serve as a terminus of the Lateral 4 canal.



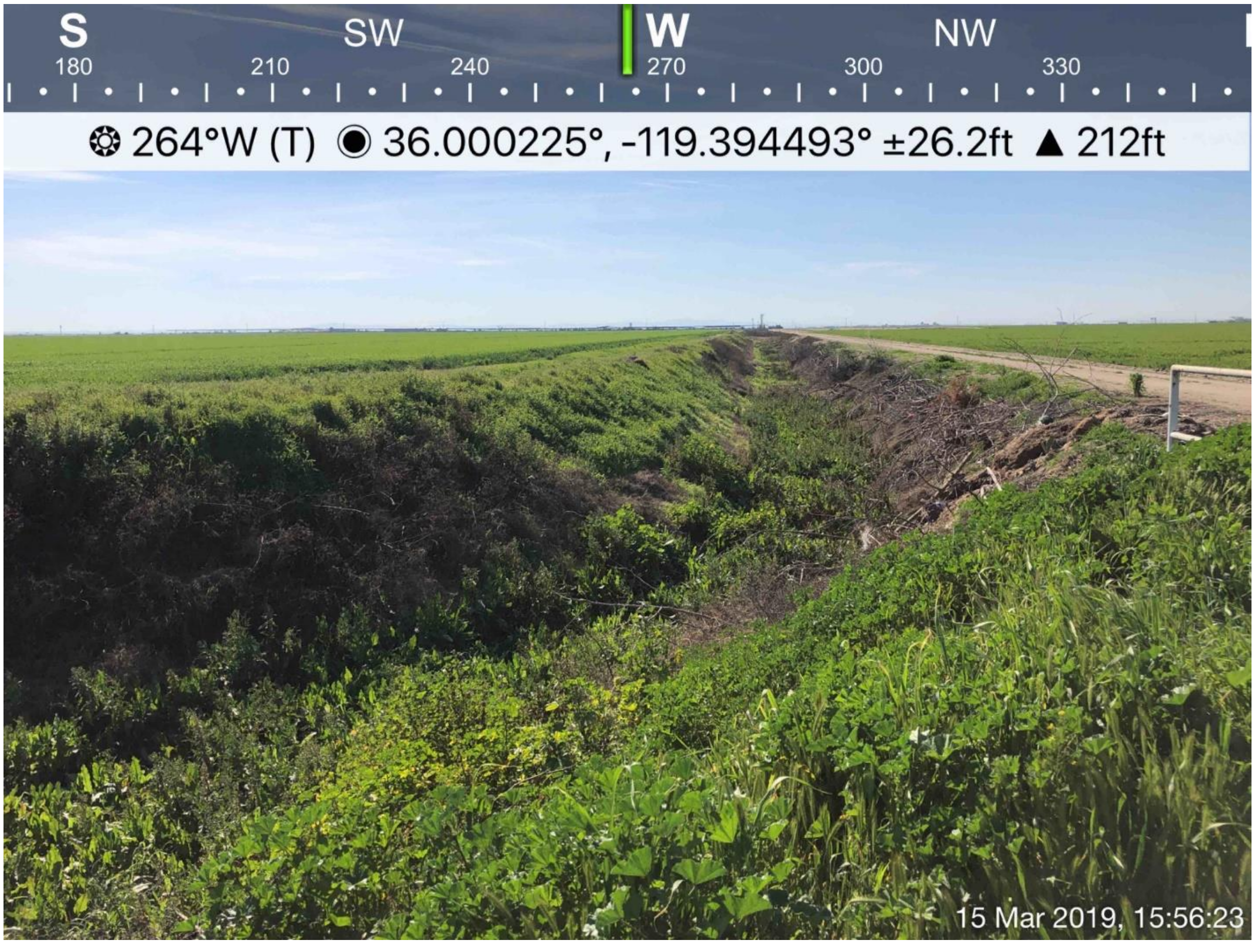
Photograph 32: Overview of proposed location of Road 84 basin and terminus of Lateral 4 canal (if this alternative is chosen).



Photograph 33: Existing irrigation basin adjacent to proposed Lateral 4 alignment, east of Road 80/Elk Bayou Avenue.



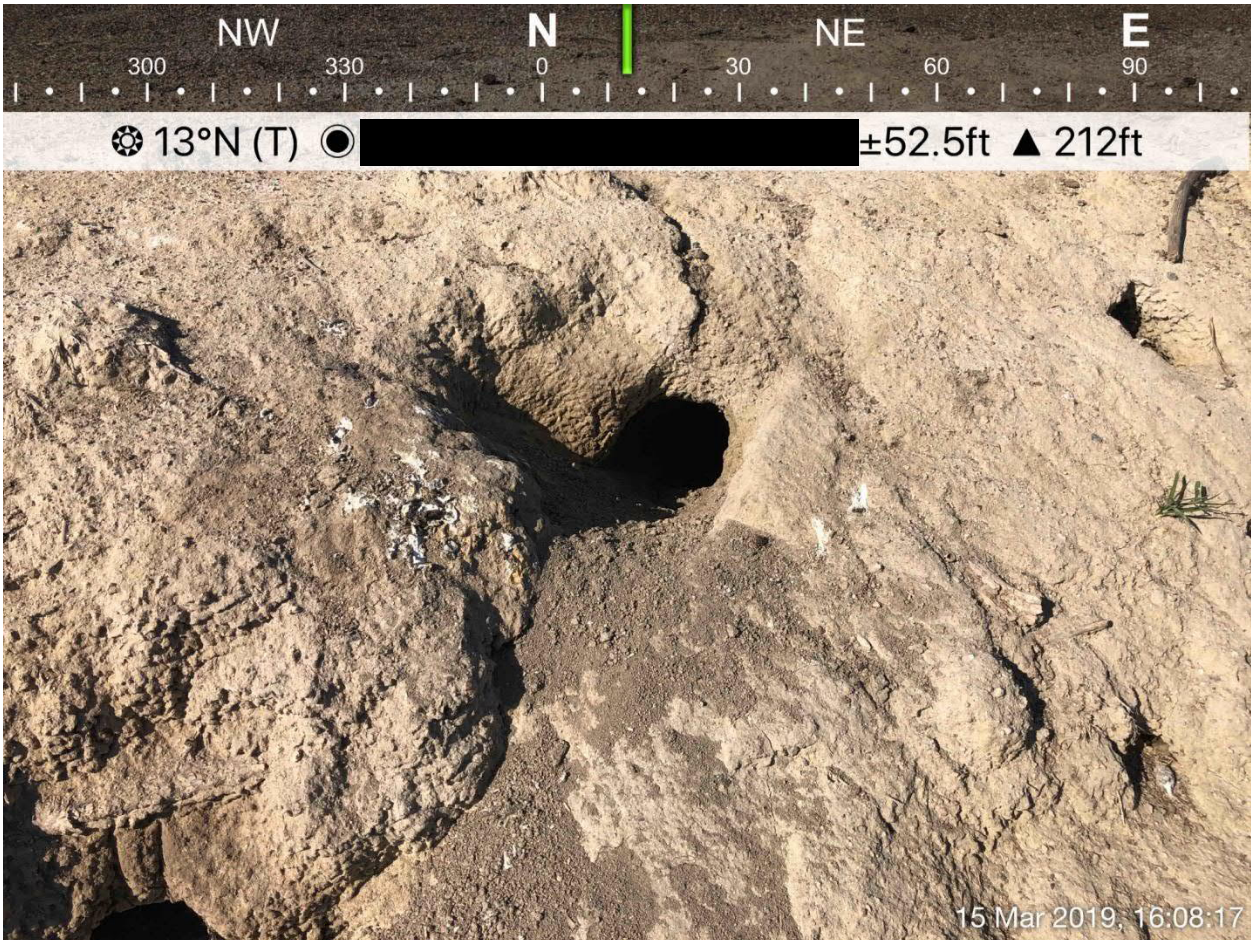
Photograph 34: Overview of proposed Lateral 4 canal alignment along compacted dirt road, near Road 80/Elk Bayou Avenue.



Photograph 35: Overview of canal west of the residential development at Road 80/Elk Bayou Avenue.

Photograph 36: Piles of burned trash and debris are present within and adjacent to the canal west of the residential development on Road 80/Elk Bayou Avenue.

Photograph 37: Active burrowing owl burrow [redacted] A burrowing owl was observed standing at the entrance of a burrow near top of bank along a canal, and it flushed into an adjacent dairy-forage field when approached. Upon inspection, the burrow was comprised of a ground squirrel burrow and decorative debris, feathers, whitewash, and pellets were visible around the entrance. A single owl was observed at this location.



Photograph 38: A closer view of the entrance of the burrow in Photograph 37. Decorative debris, feathers, whitewash, and pellets were visible around the entrance.

Photograph 39: Overview of the canal west of the burrowing owl burrow.

Photograph 40: A standing pool of water in the existing canal near the western terminus of the proposed Lateral 4 canal alignment. California toads, American bullfrogs, and waterfowl were observed.

Photograph 41: Barren, compacted dirt and recent ground disturbance at the proposed site of Road 76 basin. This is one alternative for the location of the proposed basin. If the Project chooses this location for the basin, the Lateral 4 canal would terminate into this basin.

Photograph 42: Active burrowing owl burrow [redacted]

Photograph 43: Active burrowing owl burrow [redacted]

Photograph 44: Active burrowing owl burrow [redacted]

Photograph 45: Active burrowing owl burrow [redacted]

Photograph 46: Active burrowing owl burrow [redacted]

Photograph 47: Active burrowing owl burrow [redacted]

Photograph 48: Potentially active burrowing owl burrow [redacted] An owl was not observed flushing from this burrow, but prey remnants were present at the entrance.

Photograph 49: All of the active burrowing owl burrows were located along the northern bank (pictured), and all were on the upper half of the bank. All of the owls observed flushed into the dairy forage field to the north.

Photograph 50: Overview of the existing basin at the proposed alternative basin location [redacted] Forage crops are planted in the bottom of the basin currently. There was a pool of standing water present in the northeast portion of the basin at the time of the field survey. [redacted] Recent signs of ground disturbance associated with grading, excavation, and construction were present on the eastern and western portions of the basin.

Photograph 51: Recent ground disturbance associated with irrigation improvements was evident within the basin.

Photograph 52: The interior of the existing basin is identified by the presence of green forage crops planted in the bottom. The basin is surrounded by a compacted barren dirt berm which is surrounded by an excavated canal. [redacted]

Photograph 53: Ground squirrel and coyote tracks around this exposed pipe in the proposed alternative basin location (Road 76 basin).

Photograph 54: Irrigation ditch west of the proposed alternative basin location (Road 76 basin).

Appendix B. CNDDB Query Results

Selected Elements by Common Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Pixley (3511983) OR Allensworth (3511974) OR Delano West (3511973) OR Delano East (3511972) OR Alpaugh (3511984) OR Sausalito School (3511982) OR Taylor Weir (3611914) OR Tipton (3611913) OR Woodville (3611912) OR Hacienda Ranch (3511975) OR Hacienda Ranch NE (3511985) OR Corcoran (3611915) OR Waukena (3611925) OR Paige (3611924) OR Tulare (3611923) OR Cairns Corner (3611922))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
alkali mariposa-lily *Calochortus striatus*	PMLIL0D190	None	None	G3?	S2S3	1B.2
American badger *Taxidea taxus*	AMAJF04010	None	None	G5	S3	SSC
An andrenid bee *Andrena macswaini*	IIHYM35130	None	None	G2	S2	
Bakersfield legless lizard *Anniella grinnelli*	ARACC01050	None	None	G2G3	S2S3	SSC
black-crowned night heron *Nycticorax nycticorax*	ABNGA11010	None	None	G5	S4	
blunt-nosed leopard lizard *Gambelia sila*	ARACF07010	Endangered	Endangered	G1	S1	FP
brittlescale *Atriplex depressa*	PDCHE042L0	None	None	G2	S2	1B.2
burrowing owl *Athene cunicularia*	ABNSB10010	None	None	G4	S3	SSC
California alkali grass *Puccinellia simplex*	PMPOA53110	None	None	G3	S2	1B.2
California jewelflower *Caulanthus californicus*	PDBRA31010	Endangered	Endangered	G1	S1	1B.1
coast horned lizard *Phrynosoma blainvillii*	ARACF12100	None	None	G3G4	S3S4	SSC
Coulter's goldfields *Lasthenia glabrata ssp. coulteri*	PDAST5L0A1	None	None	G4T2	S2	1B.1
Earlimart orache *Atriplex cordulata var. erecticaulis*	PDCHE042V0	None	None	G3T1	S1	1B.2
fulvous whistling-duck *Dendrocygna bicolor*	ABNJB01010	None	None	G5	S1	SSC
golden eagle *Aquila chrysaetos*	ABNKC22010	None	None	G5	S3	FP
hoary bat *Lasiurus cinereus*	AMACC05030	None	None	G5	S4	
Hopping's blister beetle *Lytta hoppingi*	IICOL4C010	None	None	G1G2	S1S2	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Kern brook lamprey *Entosphenus hubbsi*	AFBAA02040	None	None	G1G2	S1S2	SSC
Kern mallow *Eremalche parryi ssp. kernensis*	PDMAL0C031	Endangered	None	G3G4T3	S3	1B.2
lesser saltscale *Atriplex minuscula*	PDCHE042M0	None	None	G2	S2	1B.1
Lost Hills crownscale *Atriplex coronata var. vallicola*	PDCHE04250	None	None	G4T2	S2	1B.2
Merced phacelia *Phacelia ciliata var. opaca*	PDHYD0C0S2	None	None	G5TH	SH	3.2
molestan blister beetle *Lytta molesta*	IICOL4C030	None	None	G2	S2	
Morrison's blister beetle *Lytta morrisoni*	IICOL4C040	None	None	G1G2	S1S2	
mountain plover *Charadrius montanus*	ABNNB03100	None	None	G3	S2S3	SSC
Nelson's antelope squirrel *Ammospermophilus nelsoni*	AMAFB04040	None	Threatened	G2	S2S3	
Northern Claypan Vernal Pool *Northern Claypan Vernal Pool*	CTT44120CA	None	None	G1	S1.1	
recurved larkspur *Delphinium recurvatum*	PDRAN0B1J0	None	None	G2?	S2?	1B.2
San Joaquin adobe sunburst *Pseudobahia peirsonii*	PDAST7P030	Threatened	Endangered	G1	S1	1B.1
San Joaquin coachwhip *Masticophis flagellum ruddocki*	ARADB21021	None	None	G5T2T3	S2?	SSC
San Joaquin kit fox *Vulpes macrotis mutica*	AMAJA03041	Endangered	Threatened	G4T2	S2	
San Joaquin Pocket Mouse *Perognathus inornatus*	AMAFD01060	None	None	G2G3	S2S3	
San Joaquin tiger beetle *Cicindela tranquebarica ssp.*	IICOL0220E	None	None	G5T1	S1	
San Joaquin woollythreads *Monolopia congdonii*	PDASTA8010	Endangered	None	G2	S2	1B.2
slough thistle *Cirsium crassicaule*	PDAST2E0U0	None	None	G1	S1	1B.1
snowy egret *Egretta thula*	ABNGA06030	None	None	G5	S4	
spiny-sepaled button-celery *Eryngium spinosepalum*	PDAPI0Z0Y0	None	None	G2	S2	1B.2
subtle orache *Atriplex subtilis*	PDCHE042T0	None	None	G1	S1	1B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Swainson's hawk *Buteo swainsoni*	ABNKC19070	None	Threatened	G5	S3	
Tipton kangaroo rat *Dipodomys nitratoides nitratoides*	AMAFD03152	Endangered	Endangered	G3T1T2	S1S2	
tricolored blackbird *Agelaius tricolor*	ABPBXB0020	None	Candidate Endangered	G2G3	S1S2	SSC
Tulare grasshopper mouse *Onychomys torridus tularensis*	AMAFF06021	None	None	G5T1T2	S1S2	SSC
Valley Sacaton Grassland *Valley Sacaton Grassland*	CTT42120CA	None	None	G1	S1.1	
Valley Saltbush Scrub *Valley Saltbush Scrub*	CTT36220CA	None	None	G2	S2.1	
Valley Sink Scrub *Valley Sink Scrub*	CTT36210CA	None	None	G1	S1.1	
vernal pool fairy shrimp *Branchinecta lynchi*	ICBRA03030	Threatened	None	G3	S3	
vernal pool smallscale *Atriplex persistens*	PDCHE042P0	None	None	G2	S2	1B.2
western snowy plover *Charadrius alexandrinus nivosus*	ABNNB03031	Threatened	None	G3T3	S2S3	SSC
western spadefoot *Spea hammondii*	AAABF02020	None	None	G3	S3	SSC
white-faced ibis *Plegadis chihi*	ABNGE02020	None	None	G5	S3S4	WL

Record Count: 50

Appendix C. USFWS Species List

United States Department of the Interior

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

In Reply Refer To: March 12, 2019
Consultation Code: 08ESMF00-2019-SLI-1332
Event Code: 08ESMF00-2019-E-04303
Project Name: PIXID- Deer Creek Check Structure

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

To Whom It May Concern:

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

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

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

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

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

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

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

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

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

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

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

Attachment(s):

- Official Species List

Official Species List

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

This species list is provided by:

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

Project Summary

Consultation Code: 08ESMF00-2019-SLI-1332

Event Code: 08ESMF00-2019-E-04303

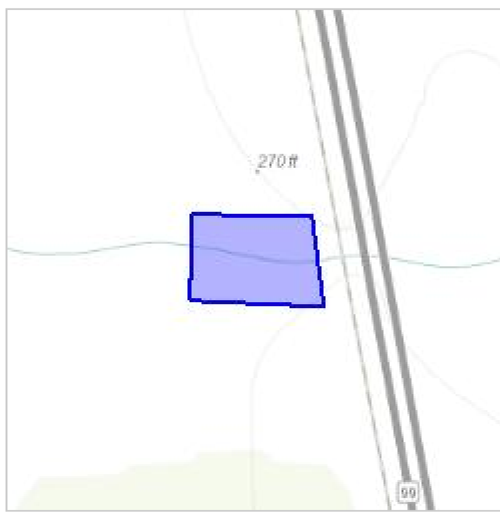
Project Name: PIXID- Deer Creek Check Structure

Project Type: STREAM / WATERBODY / CANALS / LEVEES / DIKES

Project Description: Pixley Irrigation District (PIXID) is pursuing options to retrofit the Deer Creek Check Structure with automated gates for better managing flows in Deer Creek for beneficial use within the District.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/35.91352515579184N119.28260020004024W



Counties: Tulare, CA

Endangered Species Act Species

There is a total of 8 threatened, endangered, or candidate species on this species list.

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

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

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

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

Mammals

NAME	STATUS
San Joaquin Kit Fox *Vulpes macrotis mutica* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2873	Endangered
Tipton Kangaroo Rat *Dipodomys nitratoides nitratoides* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7247 Species survey guidelines: https://ecos.fws.gov/ipac/guideline/survey/population/40/office/11420.pdf	Endangered

Reptiles

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

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened

Fishes

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

Crustaceans

NAME	STATUS
Conservancy Fairy Shrimp *Branchinecta conservatio* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8246	Endangered
Vernal Pool Fairy Shrimp *Branchinecta lynchi* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/498	Threatened

Critical habitats

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

United States Department of the Interior

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

In Reply Refer To: March 12, 2019
Consultation Code: 08ESMF00-2019-SLI-1333
Event Code: 08ESMF00-2019-E-04306
Project Name: PIXID- Lateral 4

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

To Whom It May Concern:

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

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

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

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

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

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

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

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

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

Attachment(s):

- Official Species List

Official Species List

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

This species list is provided by:

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

Project Summary

Consultation Code: 08ESMF00-2019-SLI-1333

Event Code: 08ESMF00-2019-E-04306

Project Name: PIXID- Lateral 4

Project Type: WATER SUPPLY / DELIVERY

Project Description: Pixley Irrigation District (PIXID or District) recently performed a feasibility study for developing surface water delivery system alternatives for the northwestern portion of the District. This area of the District does not have access to surface water and therefore is entirely reliant on groundwater pumping. The District is pursing development of the surface water delivery system in phases. The first phase is to develop an open channel, gravity conveyance beginning from the end of the existing West Main Canal and terminate in a basin. The facility will primarily run along the Avenue 116 alignment starting at Road 116 and end between Road 84 and Road 76, with two basin alternatives. Alternative one is the Road 84 basin, and alternative two is the Road 76 basin.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/35.994672742103674N119.36517336673981W

Counties: Tulare, CA

Endangered Species Act Species

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

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

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

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

---

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

Mammals

NAME	STATUS
San Joaquin Kit Fox *Vulpes macrotis mutica* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2873	Endangered
Tipton Kangaroo Rat *Dipodomys nitratoides nitratoides* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7247 Species survey guidelines: https://ecos.fws.gov/ipac/guideline/survey/population/40/office/11420.pdf	Endangered

Birds

NAME	STATUS
Western Snowy Plover *Charadrius nivosus nivosus* Population: Pacific Coast population DPS-U.S.A. (CA, OR, WA), Mexico (within 50 miles of Pacific coast) There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8035	Threatened

Reptiles

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

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened

Fishes

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

Crustaceans

NAME	STATUS
Conservancy Fairy Shrimp *Branchinecta conservatio* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8246	Endangered
Vernal Pool Fairy Shrimp *Branchinecta lynchi* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/498	Threatened

Critical habitats

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

Appendix D. NOAA EFH Mapping Query Results

EFH Data Notice: Essential Fish Habitat (EFH) is defined by textual descriptions contained in the fishery management plans developed by the regional Fishery Management Councils. In most cases mapping data can not fully represent the complexity of the habitats that make up EFH. This report should be used for general interest queries only and should not be interpreted as a definitive evaluation of EFH at this location. A location-specific evaluation of EFH for any official purposes must be performed by a regional expert. Please refer to the following links for the appropriate regional resources.

West Coast Regional Office
Alaska Regional Office

Query Results

Degrees, Minutes, Seconds: Latitude = 35º54'45" N, Longitude = 120º41'0" W
Decimal Degrees: Latitude = 35.91, Longitude = -119.32

The query location intersects with spatial data representing EFH and/or HAPCs for the following species/management units.

HAPCs

No Habitat Areas of Particular Concern (HAPC) were identified at the report location.

EFH Areas Protected from Fishing

No EFH Areas Protected from Fishing (EFHA) were identified at the report location.

Spatial data does not currently exist for all the managed species in this area. The following is a list of species or management units for which there is no spatial data. ****For links to all EFH text descriptions see the complete data inventory: open data inventory -->**
Pacific Coastal Pelagic Species, Jack Mackerel, Pacific (Chub) Mackerel, Pacific Sardine, Northern Anchovy - Central Subpopulation, Northern Anchovy - Northern Subpopulation, **Pacific Highly Migratory Species,** Bigeye Thresher Shark - North Pacific, Bluefin Tuna - Pacific, Dolphinfish (Dorado or Mahimahi) - Pacific, Pelagic Thresher Shark - North Pacific,

Spatial data does not currently exist for all the managed species in this area. The following is a list of species or management units for which there is no spatial data. ****For links to all EFH text descriptions see the complete data inventory: open data inventory -->**
Swordfish - North Pacific, **West Coast Salmon**, All species and stocks

EFH Data Notice: Essential Fish Habitat (EFH) is defined by textual descriptions contained in the fishery management plans developed by the regional Fishery Management Councils. In most cases mapping data can not fully represent the complexity of the habitats that make up EFH. This report should be used for general interest queries only and should not be interpreted as a definitive evaluation of EFH at this location. A location-specific evaluation of EFH for any official purposes must be performed by a regional expert. Please refer to the following links for the appropriate regional resources.

West Coast Regional Office
Alaska Regional Office

Query Results

Degrees, Minutes, Seconds: Latitude = 35º54'45" N, Longitude = 120º41'0" W
Decimal Degrees: Latitude = 35.91, Longitude = -119.32

The query location intersects with spatial data representing EFH and/or HAPCs for the following species/management units.

HAPCs

No Habitat Areas of Particular Concern (HAPC) were identified at the report location.

EFH Areas Protected from Fishing

No EFH Areas Protected from Fishing (EFHA) were identified at the report location.

Spatial data does not currently exist for all the managed species in this area. The following is a list of species or management units for which there is no spatial data.
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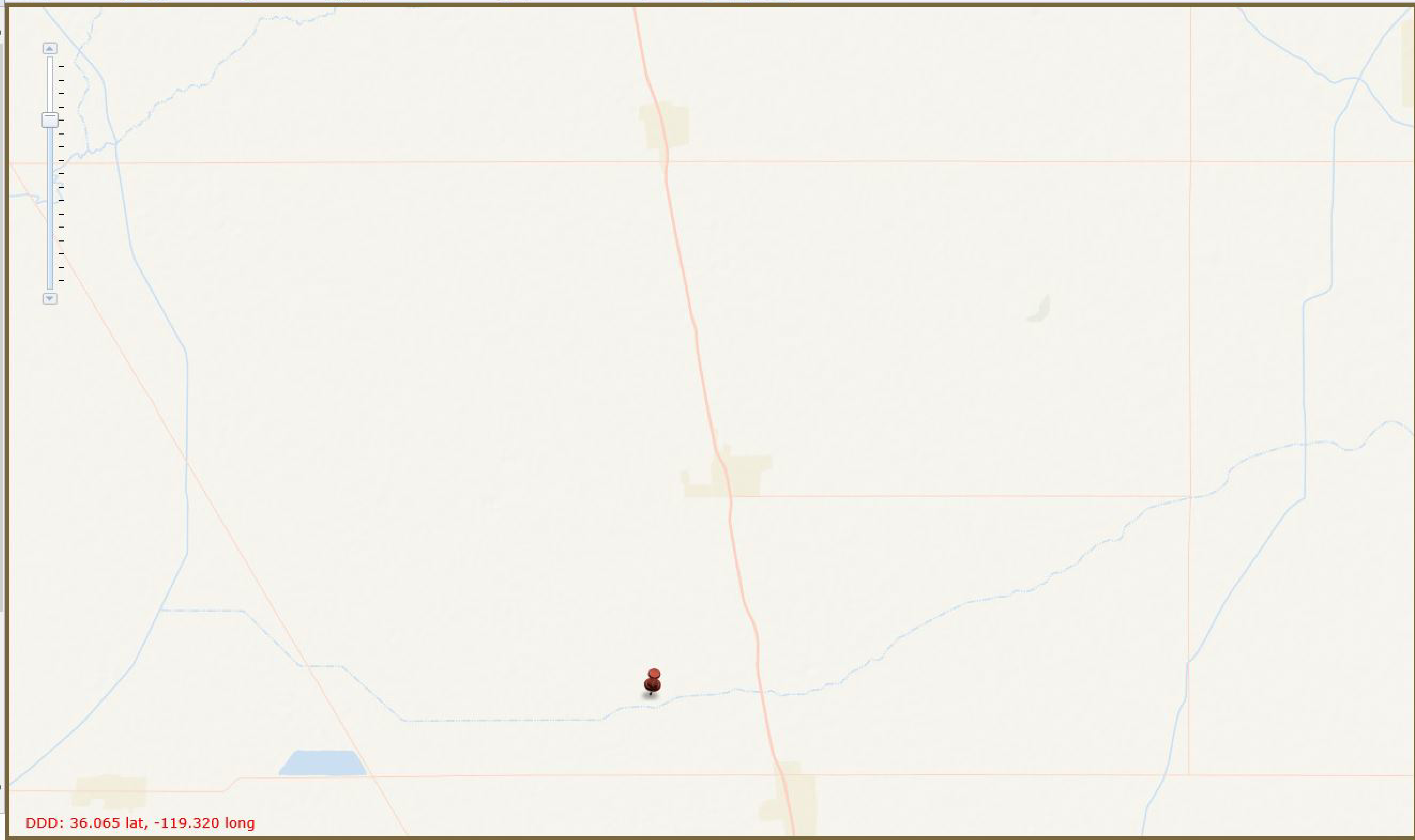
open data inventory -->

Pacific Coastal Pelagic Species,



Appendix E. Soils Report

USDA United States Department of Agriculture

NRCS Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

Tulare County, Western Part, California

PIXID- Deer Creek Check Structure

March 12, 2019

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

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Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

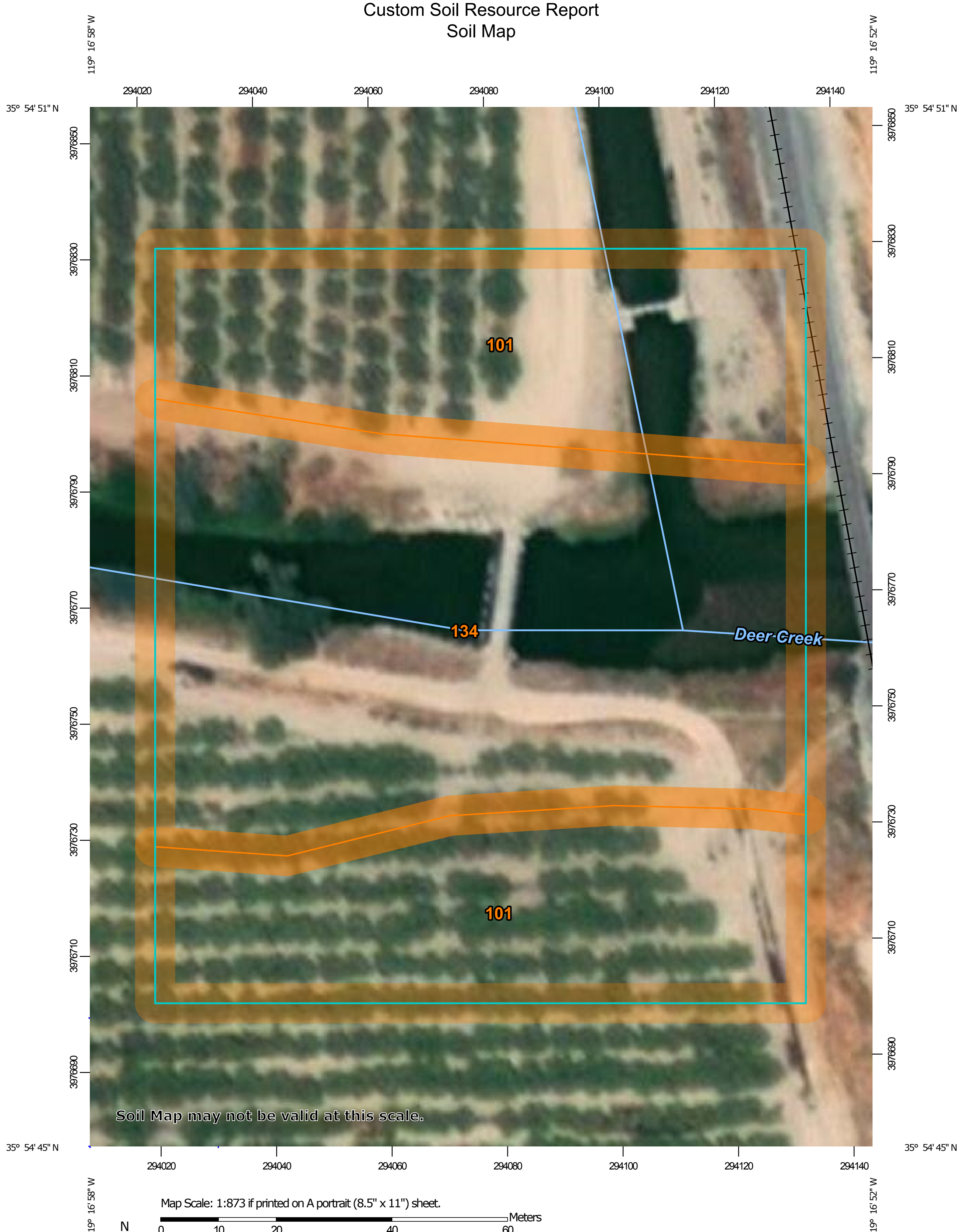
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:873 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0, 10, 20, 40, 60

Feet: 0, 40, 80, 160, 240

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Tulare County, Western Part, California
Survey Area Data: Version 12, Sep 12, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 15, 2016—Nov 5, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
101	Akers-Akers, saline-Sodic, complex, 0 to 2 percent slopes	1.8	48.8%
134	Riverwash	1.9	51.2%
Totals for Area of Interest		**3.6**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Tulare County, Western Part, California

101—Akers-Akers, saline-Sodic, complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hp6z
Elevation: 230 to 350 feet
Mean annual precipitation: 8 to 12 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 225 to 300 days
Farmland classification: Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Akers and similar soils: 60 percent
Akers, saline-sodic, and similar soils: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Akers

Setting

Landform: Fan remnants
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granitic rock sources

Typical profile

Ap - 0 to 16 inches: fine sandy loam
Bk - 16 to 60 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Gypsum, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Akers, Saline-sodic

Setting

Landform: Fan remnants
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granitic rock sources

Typical profile

Ap - 0 to 15 inches: fine sandy loam
Bk - 15 to 60 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Gypsum, maximum in profile: 2 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 30.0
Available water storage in profile: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Tujunga

Percent of map unit: 3 percent
Landform: Flood plains
Hydric soil rating: No

Colpien

Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Grangeville

Percent of map unit: 2 percent
Landform: Flood plains, alluvial fans
Hydric soil rating: No

Hanford

Percent of map unit: 2 percent
Landform: Flood plains, alluvial fans

Hydric soil rating: No

Yettem

Percent of map unit: 2 percent
Landform: Flood plains, alluvial fans
Hydric soil rating: No

Tagus

Percent of map unit: 2 percent
Landform: Fan remnants
Hydric soil rating: No

Unnamed, ponded

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

134—Riverwash

Map Unit Composition

Riverwash: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Riverwash

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Properties and qualities

Slope: 0 to 2 percent
Frequency of flooding: Frequent

Interpretive groups

Land capability classification (irrigated): 8
Land capability classification (nonirrigated): 8
Hydric soil rating: Yes

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United States Department of Agriculture

NRCS

Natural Resources Conservation Service

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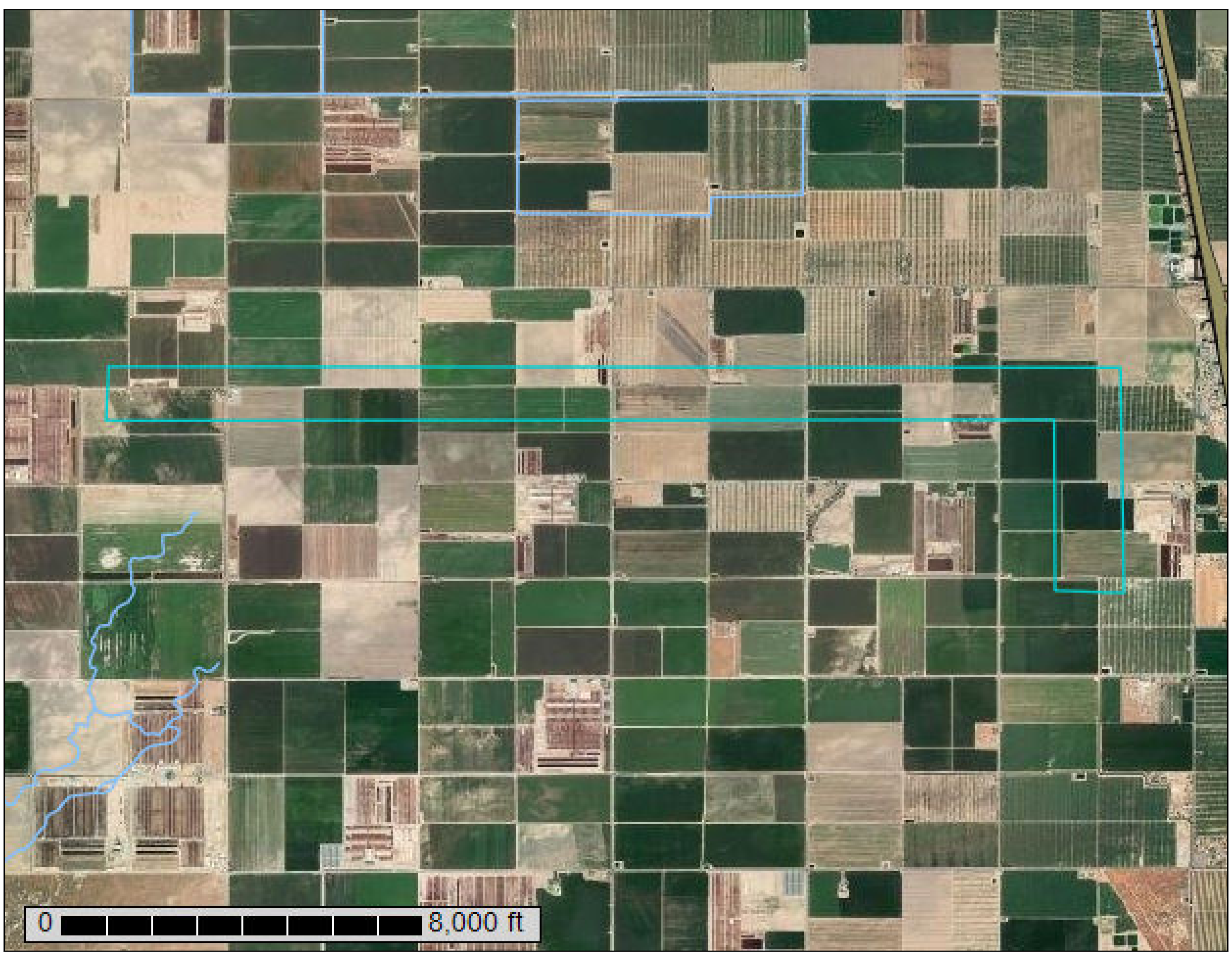
Custom Soil Resource Report for Tulare County, Western Part, California

PIXID- Lateral 4



March 12, 2019

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Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

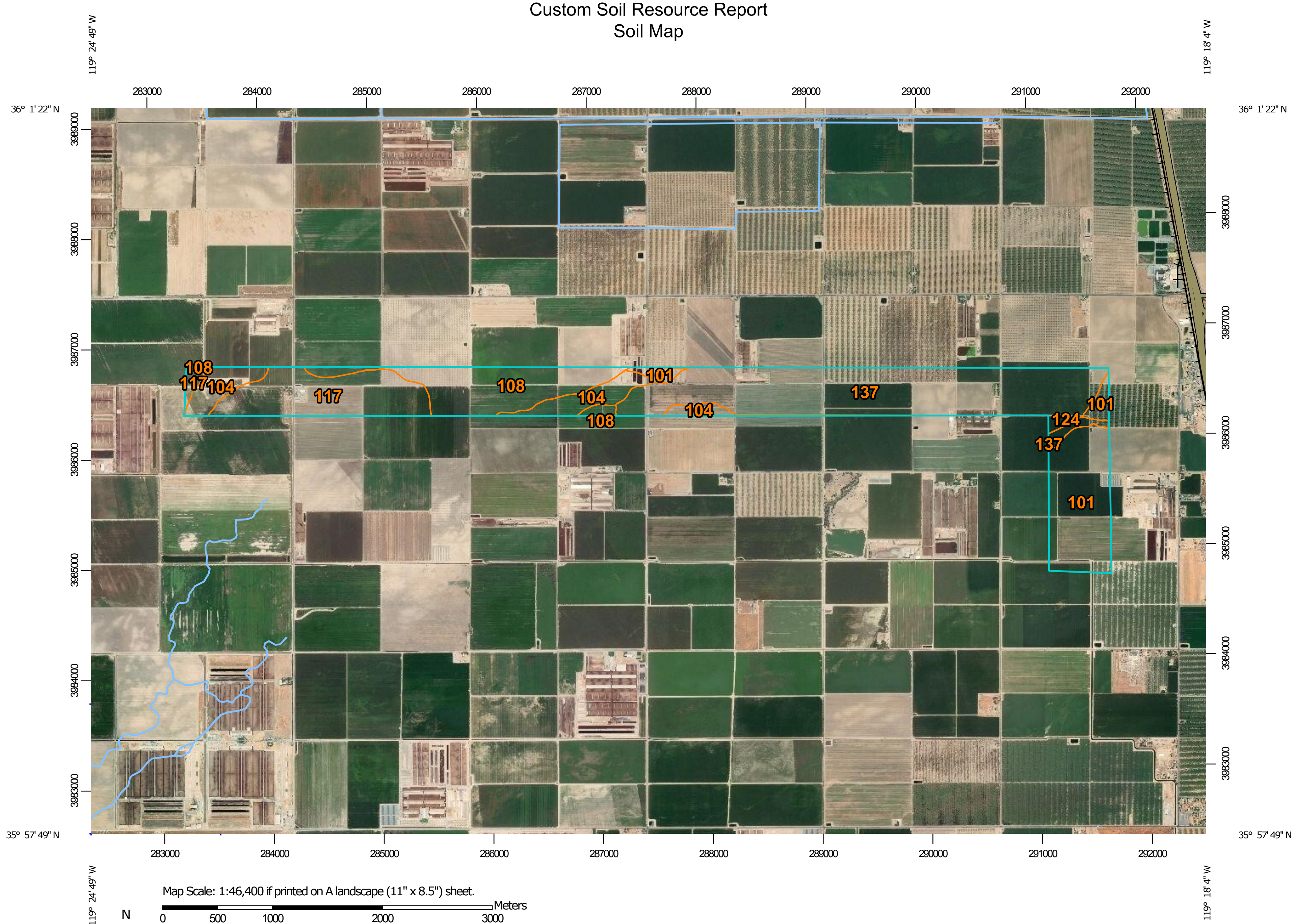
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:46,400 if printed on A landscape (11" x 8.5") sheet.

N

0 500 1000 2000 3000 Meters

0 2000 4000 8000 12000 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Tulare County, Western Part, California
Survey Area Data: Version 12, Sep 12, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 15, 2016—Nov 5, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
101	Akers-Akers, saline-Sodic, complex, 0 to 2 percent slopes	201.0	18.1%
104	Biggriz-Biggriz, saline-Sodic, complex, 0 to 2 percent slopes	104.1	9.4%
108	Colpien loam, 0 to 2 percent slopes	174.1	15.6%
117	Gambogy loam, drained, 0 to 1 percent slopes	180.6	16.2%
124	Hanford sandy loam, 0 to 2 percent slopes	12.0	1.1%
137	Tagus loam, 0 to 2 percent slopes	441.4	39.6%
Totals for Area of Interest		**1,113.4**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Tulare County, Western Part, California

101—Akers-Akers, saline-Sodic, complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hp6z
Elevation: 230 to 350 feet
Mean annual precipitation: 8 to 12 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 225 to 300 days
Farmland classification: Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Akers and similar soils: 60 percent
Akers, saline-sodic, and similar soils: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Akers

Setting

Landform: Fan remnants
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granitic rock sources

Typical profile

Ap - 0 to 16 inches: fine sandy loam
Bk - 16 to 60 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Gypsum, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Akers, Saline-sodic

Setting

Landform: Fan remnants
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granitic rock sources

Typical profile

Ap - 0 to 15 inches: fine sandy loam
Bk - 15 to 60 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Gypsum, maximum in profile: 2 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 30.0
Available water storage in profile: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Tujunga

Percent of map unit: 3 percent
Landform: Flood plains
Hydric soil rating: No

Colpien

Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Grangeville

Percent of map unit: 2 percent
Landform: Flood plains, alluvial fans
Hydric soil rating: No

Hanford

Percent of map unit: 2 percent
Landform: Flood plains, alluvial fans

Hydric soil rating: No

Yettem

Percent of map unit: 2 percent
Landform: Flood plains, alluvial fans
Hydric soil rating: No

Tagus

Percent of map unit: 2 percent
Landform: Fan remnants
Hydric soil rating: No

Unnamed, ponded

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

104—Biggriz-Biggriz, saline-Sodic, complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hp46
Elevation: 190 to 270 feet
Mean annual precipitation: 6 to 8 inches
Mean annual air temperature: 63 to 66 degrees F
Frost-free period: 250 to 300 days
Farmland classification: Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Biggriz and similar soils: 55 percent
Biggriz, saline-sodic, and similar soils: 30 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Biggriz

Setting

Landform: Fan remnants
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granitic rock sources

Typical profile

Ap - 0 to 14 inches: loam
Btkg - 14 to 50 inches: loam
Btkng - 50 to 65 inches: sandy loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Gypsum, maximum in profile: 1 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 13.0
Available water storage in profile: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Hydric soil rating: No

Description of Biggriz, Saline-sodic

Setting

Landform: Fan remnants
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granitic rock sources

Typical profile

Ap - 0 to 14 inches: loam
Btkg - 14 to 50 inches: loam
Btkng - 50 to 65 inches: sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Gypsum, maximum in profile: 1 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 200.0
Available water storage in profile: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Nord

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Gambogy

Percent of map unit: 3 percent
Landform: Flood plains, alluvial fans
Hydric soil rating: No

Garces

Percent of map unit: 2 percent
Landform: Fan remnants
Hydric soil rating: No

Tujunga

Percent of map unit: 2 percent
Landform: Flood plains
Hydric soil rating: No

Lethent

Percent of map unit: 2 percent
Landform: Fan remnants
Hydric soil rating: No

Colpien

Percent of map unit: 2 percent
Landform: Fan remnants
Hydric soil rating: No

Unnamed, ponded

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

108—Colpien loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hp4b
Elevation: 220 to 550 feet
Mean annual precipitation: 8 to 12 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 250 to 300 days
Farmland classification: Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Colpien and similar soils: 85 percent

Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Colpien

Setting

Landform: Fan remnants
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granitic rock sources

Typical profile

Ap - 0 to 6 inches: loam
Bt - 6 to 24 inches: loam
Btk - 24 to 60 inches: loam
C - 60 to 65 inches: sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.5 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: High (about 10.7 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Gambogy

Percent of map unit: 3 percent
Landform: Flood plains, alluvial fans
Hydric soil rating: No

Hanford

Percent of map unit: 3 percent
Landform: Flood plains, alluvial fans
Hydric soil rating: No

Biggriz

Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Tujunga

Percent of map unit: 2 percent
Landform: Flood plains
Hydric soil rating: No

Nord

Percent of map unit: 2 percent
Landform: Flood plains, alluvial fans
Hydric soil rating: No

Akers, saline-sodic

Percent of map unit: 2 percent
Landform: Fan remnants
Hydric soil rating: No

117—Gambogy loam, drained, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: hp4m
Elevation: 190 to 270 feet
Mean annual precipitation: 6 to 8 inches
Mean annual air temperature: 63 to 66 degrees F
Frost-free period: 250 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Gambogy and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gambogy

Setting

Landform: Flood plains, alluvial fans
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear, convex
Parent material: Alluvium derived from granitic rock sources

Typical profile

Ap1 - 0 to 6 inches: loam
Ap2 - 6 to 19 inches: stratified loam to clay loam
Btg - 19 to 47 inches: stratified sandy loam to clay loam
C - 47 to 72 inches: stratified sandy loam to loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 3 percent
Gypsum, maximum in profile: 1 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Hanford

Percent of map unit: 3 percent
Landform: Flood plains, alluvial fans
Hydric soil rating: No

Grangeville

Percent of map unit: 3 percent
Landform: Flood plains, alluvial fans
Hydric soil rating: No

Colpien

Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Tujunga

Percent of map unit: 2 percent
Landform: Flood plains
Hydric soil rating: No

Nord

Percent of map unit: 2 percent
Landform: Flood plains, alluvial fans
Hydric soil rating: No

Yettem

Percent of map unit: 2 percent
Landform: Flood plains, alluvial fans
Hydric soil rating: No

124—Hanford sandy loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hp4v
Elevation: 220 to 490 feet
Mean annual precipitation: 9 to 12 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 250 to 280 days
Farmland classification: Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Hanford and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hanford

Setting

Landform: Flood plains, alluvial fans
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granitic rock sources

Typical profile

Ap - 0 to 6 inches: sandy loam
C1 - 6 to 30 inches: fine sandy loam
C2 - 30 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 7.0
Available water storage in profile: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 3c

Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Tujunga

Percent of map unit: 5 percent
Landform: Flood plains
Hydric soil rating: No

Exeter

Percent of map unit: 5 percent
Landform: Fan remnants
Hydric soil rating: No

Calgro

Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Yettem

Percent of map unit: 2 percent
Landform: Flood plains, alluvial fans
Hydric soil rating: No

137—Tagus loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hp58
Elevation: 230 to 400 feet
Mean annual precipitation: 9 to 12 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 250 to 300 days
Farmland classification: Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Tagus and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tagus

Setting

Landform: Fan remnants
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granitic rock sources

Typical profile

Ap - 0 to 17 inches: loam
Bk1 - 17 to 40 inches: loam
Bk2 - 40 to 63 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Hanford

Percent of map unit: 5 percent
Landform: Flood plains, alluvial fans
Hydric soil rating: No

Tujunga

Percent of map unit: 5 percent
Landform: Flood plains
Hydric soil rating: No

Grangeville

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Colpien

Percent of map unit: 2 percent
Landform: Fan remnants
Hydric soil rating: No

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Appendix C

Cultural Resources Information

Draft

CLASS III INVENTORY/PHASE I SURVEY, PIXLEY IRRIGATION DISTRICT LATERAL 4 PROJECT, TULARE COUNTY, CALIFORNIA

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May 2019

PN 32100.00

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MANAGEMENT SUMMARY

An intensive Class III inventory/Phase I cultural resources survey was conducted for the Pixley Irrigation District (PIXID) Lateral 4 Project, near Pixley, Tulare County, California. This study was conducted by ASM Affiliates, Inc., with David S. Whitley, Ph.D., RPA, serving as principal investigator. Background studies and fieldwork for the survey were completed in April – May 2019. The study was undertaken to provide compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (16 USC 470; 36 CFR Part 800), and the California Environmental Quality Act (CEQA). The project consists of the construction of approximately 6-linear miles (mi) of ditch, two recharge basins totaling 20-acres (ac), and a turn-out structure on Deer Creek.

The area of potential effect (APE) for the project was defined as all ground-surface disturbance along with staging, lay-down and work areas. This included an approximately 6-mi long ditch corridor that was 100-ft wide; two alternative recharge basins totaling 20-acres in size, plus 100-ft buffers; and a proposed retrofit to a check-structure at Deer Creek, within an APE measuring 100 by 100-ft. The horizontal APE is approximately 94-acres (ac) in total size. The vertical APE, defined as the maximum depth of excavation, was 10-ft.

A records search of site files and maps was conducted on 19 March 2019, at the Southern San Joaquin Valley Archaeological Information Center (IC), California State University, Bakersfield. A search of the Native American Heritage Commission (NAHC) *Sacred Lands File* was completed on 19 March 2019. The IC investigations determined that the study area had not been previously surveyed in its entirety and that no cultural resources were known or had been recorded within it. Based on the NAHC records, no sacred sites or traditional cultural places had been identified within or adjacent to the study area. Outreach letters were sent and follow-up calls to tribal organizations on the NAHC contact list were made. One reponse was received. This expressed concern over the potential for buried cultural resources.

The Class III inventory/Phase I survey fieldwork was conducted in May 2019. Parallel transects spaced at 15-meter intervals were walked along the approximately 6-mi ditch route, covering a 100-ft wide corridor, as well as across the recharge basins and check-structure APEs.

One historical cultural resource was identified and documented during the survey: a segment of previously recorded Deer Creek with an existing check-structure built in 1976. In concurrence with a previous evaluation, Deer Creek and this check-structure are recommended as not NRHP/CRHR eligible or significant. Based on these findings, the construction of the ditch, recharge basins and the check structure retrofit do not have the potential to result in adverse impacts to significant historical resources or properties, and no additional cultural resource studies are recommended.

1. INTRODUCTION AND REGULATORY CONTEXT

ASM Affiliates was retained by Provost and Pritchard Consulting to conduct an intensive Class III Inventory/Phase I cultural resources survey for the PIXID Lateral 4 Project (Project), near Pixley, Tulare County, California. The purpose of this investigation was to assist with compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (54 USC § 300101 et seq.; 36 CFR Part 800), and the California Environmental Quality Act (CEQA). The investigation was undertaken, specifically, to ensure that no significant adverse effects or impacts to historical resources or historic properties occur as a result of the construction of this project.

This current study included:

- A background records search and literature review to determine if any known archaeological sites were present in the project zone and/or whether the area had been previously and systematically studied by archaeologists;
- A search of the NAHC *Sacred Lands File* to determine if any traditional cultural places or cultural landscapes have been identified within the area with outreach letters sent and follow-up calls made to the NAHC tribal contact list;
- An on-foot, intensive inventory of the Project APE to identify and record previously undiscovered cultural resources and to examine known sites; and
- A preliminary assessment of any such resources found within the subject property.

This study was conducted by ASM Affiliates, Inc., of Tehachapi, California, in March – May 2019. David S. Whitley, Ph.D., RPA, served as principal investigator. ASM Associate Archaeologist/Crew Chief Robert Azpitarte, B.A. conducted the fieldwork with the aid of ASM Assistant Archaeologists Stacey Escamilla, B.A., Timothy Polkinghorne, B.A., and Jennifer Heffler, B.A.

This manuscript constitutes a report on the Class III Inventory/Phase I survey. Subsequent chapters provide background to the investigation, including historic context studies; the findings of the archival records search; a summary of the field surveying techniques employed; and the results of the fieldwork. We conclude with management recommendations for the project area.

1.1 PROJECT LOCATION

The proposed Project includes two phases and locations. The Phase 1 APE, involving an approximately 6-mi long ditch and two alternative recharge basins, is located approximately midway between Pixley, to the south, and Earlimart, to the north, west of Highway 99 in Tulare County, California. It extends from the existing West Main Canal due north to Avenue 116. It then heads west along Avenue 116, terminating either on the south side of Avenue 116 at Road 84 or, slightly further west, on the north side of this avenue at about Road 76. The Phase 2 APE is located on Deer Creek immediately west side of Highway 99, approximately 1-mi north of Pixley.

The Project is located on open flats of the San Joaquin Valley, a large interior and relatively low-lying valley that drains northwards to the San Francisco Bay. While the study area is a significant distance from the Pacific Ocean, elevation ranges from only about 230 to 262 feet (ft) above mean sea level (amsl) for the Phase 1 ditch, with elevation increasing gradually from west to east towards the Sierra Nevada foothills. The elevation at Phase 2, the Deer Creek check-structure, is 265-ft. Deer Creek, a seasonal drainage, is the primary hydrological feature in this area, running northeast to southwest.

The proposed project spans multiple sections in three townships: Township 22 South, Range 24 East (T22S/R24E); T22S/R25E; and T23S/R25E (Figures 1.1a – 1.1e).

1.2 PROJECT DESCRIPTION AND APE

The PIXID recently performed a feasibility study for developing surface water delivery system alternatives for the northwestern portion of the District. This area of the District does not have access to surface water and therefore is entirely reliant on groundwater pumping. PIXID is pursuing development of a surface water delivery system in phases. The first phase is to develop an open channel, gravity conveyance system ("ditch," including sections of buried pipeline) beginning from the end of the existing West Main Canal and terminating in a basin. The facility will primarily run along the Avenue 116 alignment starting at Road 116 and end between Road 84 and Road 76, with two basin alternatives. Alternative one is the Road 84 basin, and alternative two is the Road 76 basin. Additionally, as a second phase, the District is pursuing options to retrofit the Deer Creek check-structure with automated bladder gates for better managing flows in Deer Creek for beneficial use within the District.

The area of potential effect (APE) for the project was defined as all ground-surface disturbance along with staging, lay-down and work areas. This included an approximately 6-mi long ditch corridor that was 100-ft wide; two recharge basins totaling 20-acres in size, plus 100-ft buffers; and a check-structure at Deer Creek, measuring 100 by 100-ft. The horizontal APE is approximately 94-acres (ac) in total size. The vertical APE, defined as the maximum depth of excavation, was 10-feet (ft).

1.3 REGULATORY CONTEXT

1.3.1 NHPA

The NHPA of 1966, as amended (54 United States Code § *et seq*.), is the primary federal legislation that outlines the federal government's responsibility to consider the effects of its actions on historic properties and affords the Advisory Council on Historic Preservation a reasonable opportunity to comment. Section 106 of the NHPA and its implementing regulations at 36 CFR Part 800 describes the process that the federal agency shall take to identify cultural resources and assess the level of effect that the proposed undertaking will have on historic properties. An undertaking is defined as a "…project, activity or program funded in whole or in part, under the direct or indirect jurisdiction of a federal agency." This includes projects that are carried out by, or on behalf of, the agency; those carried out with federal assistance; those requiring a federal permit, license, or approval; and those subject to state or local regulation administered pursuant to a delegation, or approval by, a federal agency.

A cultural resource is a broad term that includes prehistoric, historic, architectural, and traditional cultural properties. Those cultural resources that are listed on, or are eligible for inclusion in, the National Register of Historic Places (NRHP) are referred to as historic properties. The criteria for NRHP eligibility are outlined at 36 CFR Part 60. Other applicable federal cultural resources laws and regulations that could apply include, but are not limited to, the Native American Graves Protection and Repatriation Act (NAGPRA), and the Archaeological Resources Protection Act (ARPA).

Compliance with Section 106 of the NHPA (36 CFR Part 800) follows a series of steps that are designed to identify and consult with interested parties, determine the area of potential effects (APE), determine if historic properties are present within the APE, and assess the effects the undertaking will have on historic properties. Section 106 requires consultation with Indian Tribes concerning the identification of sites of religious or cultural significance and with individuals or groups who are entitled, or requested, to be consulting parties. The regulations at 36 CFR Part 800.5 require federal agencies to apply the criteria of adverse effect to the historic properties identified within the APE. The criteria of adverse effect, defined at 36 CFR Part 800.5(a)(1), states that:

> "An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association."

The 36 CFR Part 800 regulations include consultation with the State Historic Preservation Officer (SHPO) to provide an opportunity to comment on, and concur with, a federal agency's determinations. If the undertaking would result in adverse effects to historic properties, these adverse effects must be resolved in consultation with the SHPO and other parties identified during the Section 106 process before the undertaking can proceed to implementation.

1.3.2 National Register Criteria for Evaluation

The criteria for evaluation of NRHP eligibility are outlined at 36 CFR Part 60.4. A district, site, building, structure, or object must generally be at least 50 years old to be eligible for consideration as a historic property. That district, site, building, structure, or object must retain integrity of location, design, setting, materials, workmanship, feelings, and association as well as meet one of the following criteria to demonstrate its significance in American history, architecture, archeology, engineering, and culture. A district, site, building, structure, or object must:

(A) be associated with events that have made a significant contribution to the broad patterns of history; or

(B) be associated with the lives of people significant in our past; or

(C) embody the distinct characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction; or

(D) have yielded, or may be likely to yield, information important in prehistory or history.

A site must have integrity and meet one of the four criteria of eligibility to demonstrate its historic associations in order to convey its significance. A property must be associated with one or more events important in the history or prehistory in order to be considered for listing under Criterion A. Additionally, the specific association of the property, itself, must also be considered significant. Criterion B applies to properties associated with individuals whose specific contributions to the history can be identified and documented. Properties significant for their physical design or construction under Criterion C must have features with characteristics that exemplify such elements as architecture, landscape architecture, engineering, and artwork. Criterion D most commonly applies to properties that have the potential to answer, in whole or in part, important research questions about human history that can only be answered by the actual physical materials of cultural resources. A property eligible under Criterion D must demonstrate the potential to contain information relevant to the prehistory and history (*National Register Bulletin* 15).

A district, site, building, structure, or object may also be eligible for consideration as a historic property if that property meets the criteria considerations for properties generally less than 50 years old, in addition to possessing integrity and meeting the criteria for evaluation.

1.3.3 CEQA

CEQA is applicable to discretionary actions by state or local lead agencies. Under CEQA, lead agencies must analyze impacts to cultural resources. Significant impacts under CEQA occur when "historically significant" or "unique" cultural resources are adversely impacted, which occurs when such resources could be altered or destroyed through project implementation. Historically significant cultural resources are defined by eligibility for or by listing in the California Register of Historical Resources (CRHR). In practice, the federal NRHP criteria for significance applied under Section 106 are generally (although not entirely) consistent with CRHR criteria (see PRC § 5024.1, Title 14 CCR, Sections § 4852 and § 15064.5(a)(3)).

Significant cultural resources are those archaeological resources and historical properties that:

(A) Are associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

(B) Are associated with the lives of persons important in our past;

(C) Embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important creative individual, or possess high artistic values; or

(D) Have yielded, or may be likely to yield, information important in prehistory or history.

Unique resources under CEQA, in slight contrast, are those that represent:

> an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:
>
> (1) Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
>
> (2) Has a special and particular quality such as being the oldest of its type or the best available example of its type.
>
> (3) Is directly associated with a scientifically recognized important prehistoric or historic event or person (PRC § 21083.2(g)).

Preservation in place is the preferred approach under CEQA to mitigating adverse impacts to significant or unique cultural resources.

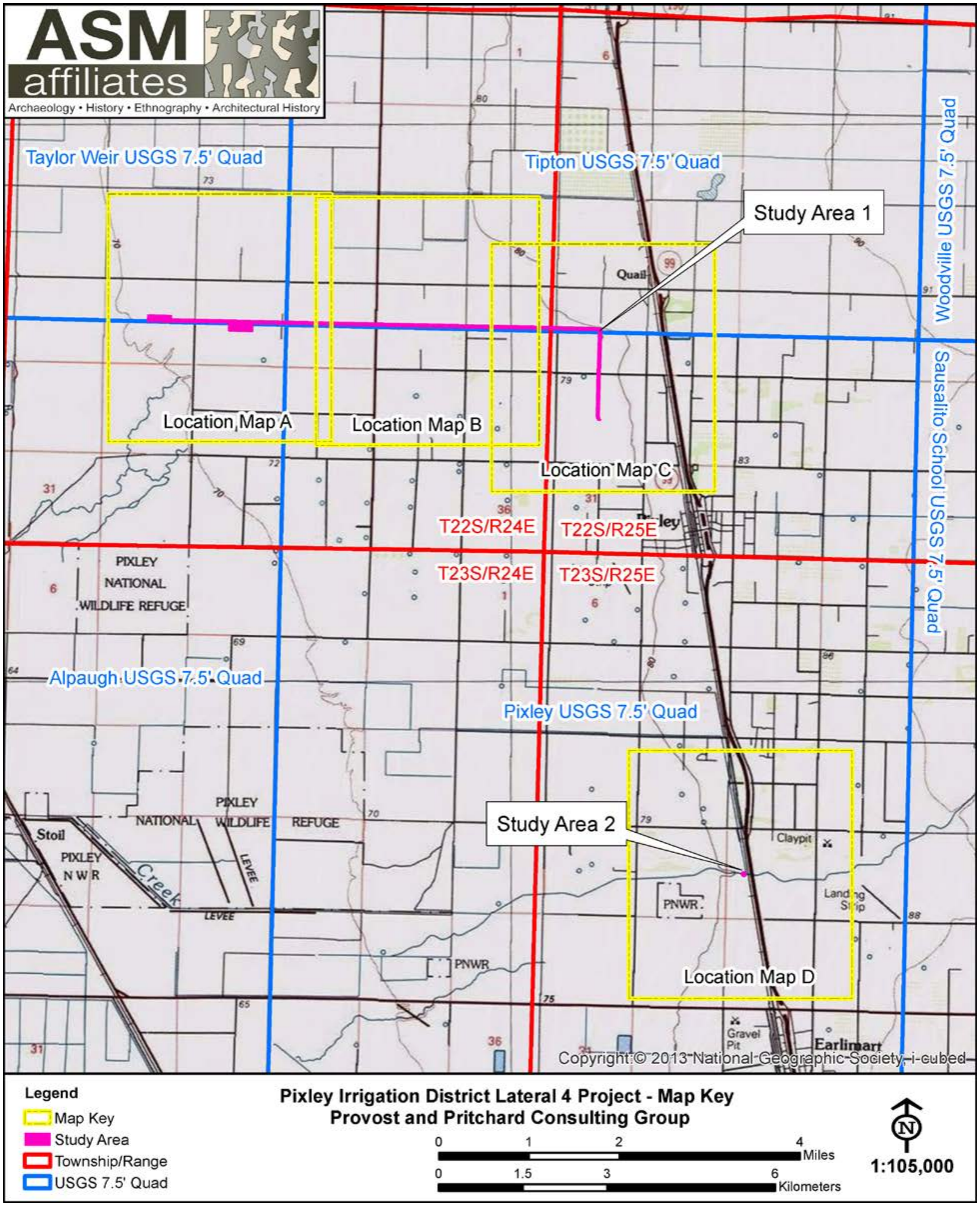

Figure 1.1a. Location of the PIXID Lateral 4 Project study areas, Tulare County, California. Map key.

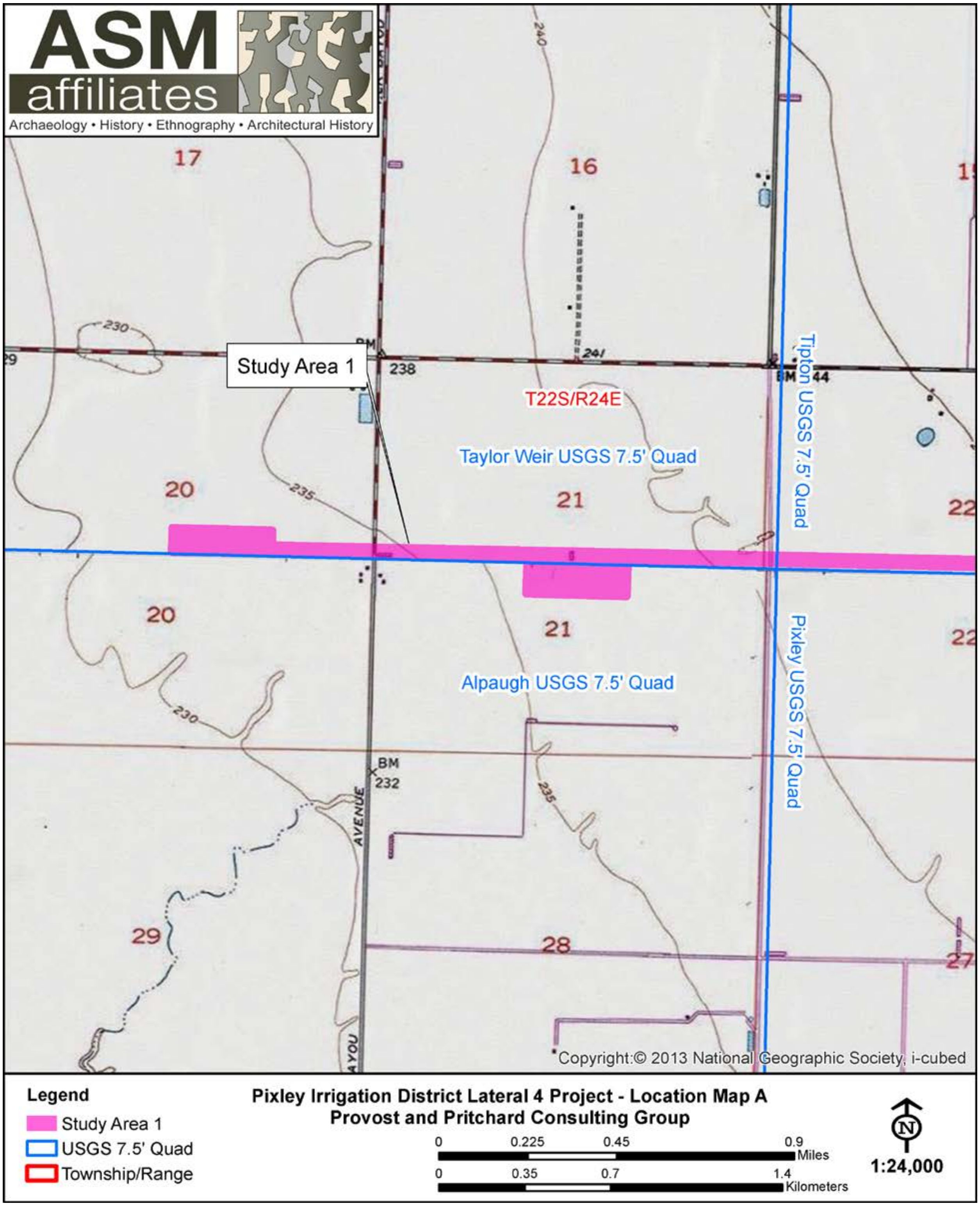

Figure 1.1b. Location of the PIXID Lateral 4 Project study areas, Tulare County, California. Map A.

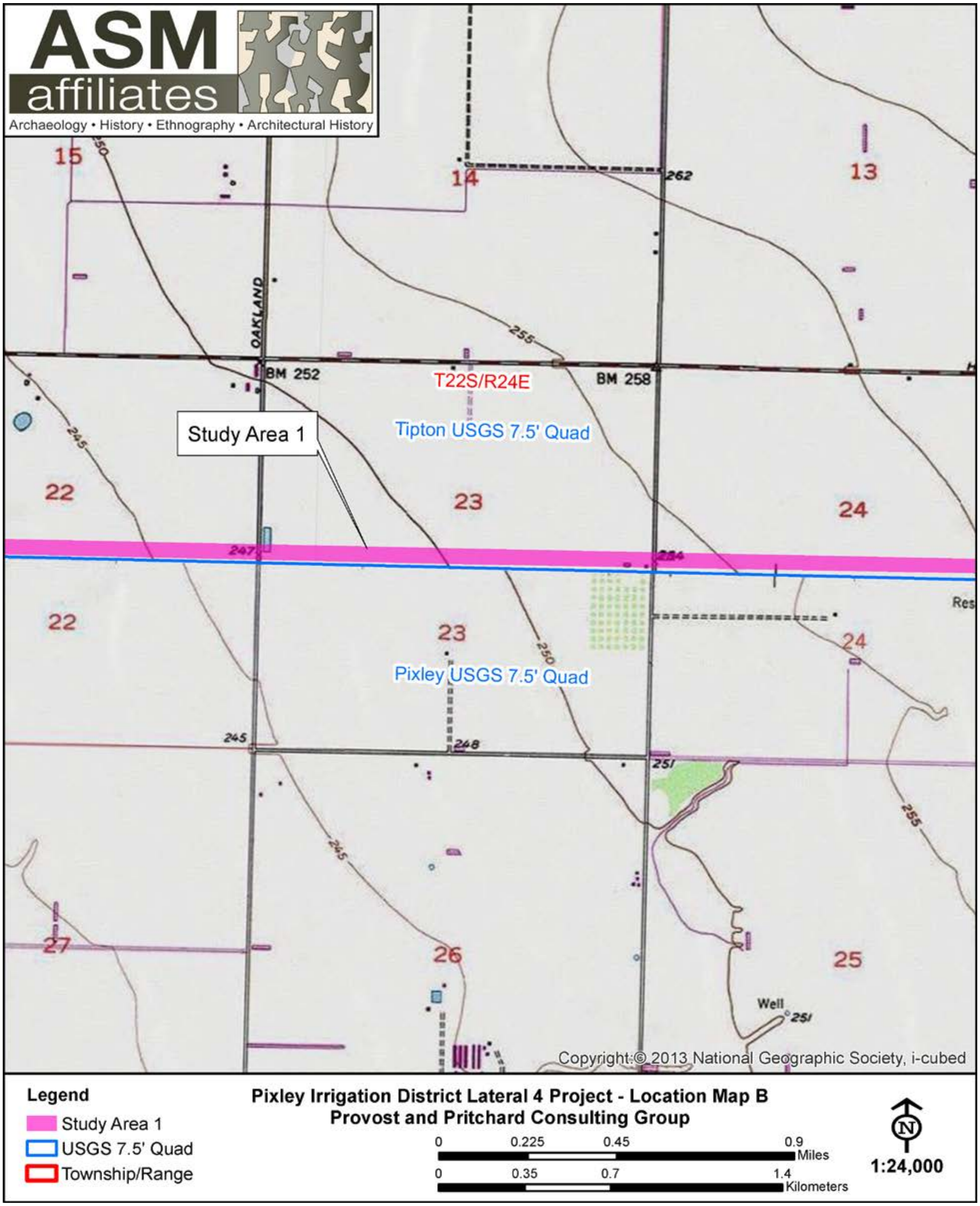

Figure 1.1c. Location of the PIXID Lateral 4 Project study areas, Tulare County, California. Map B.

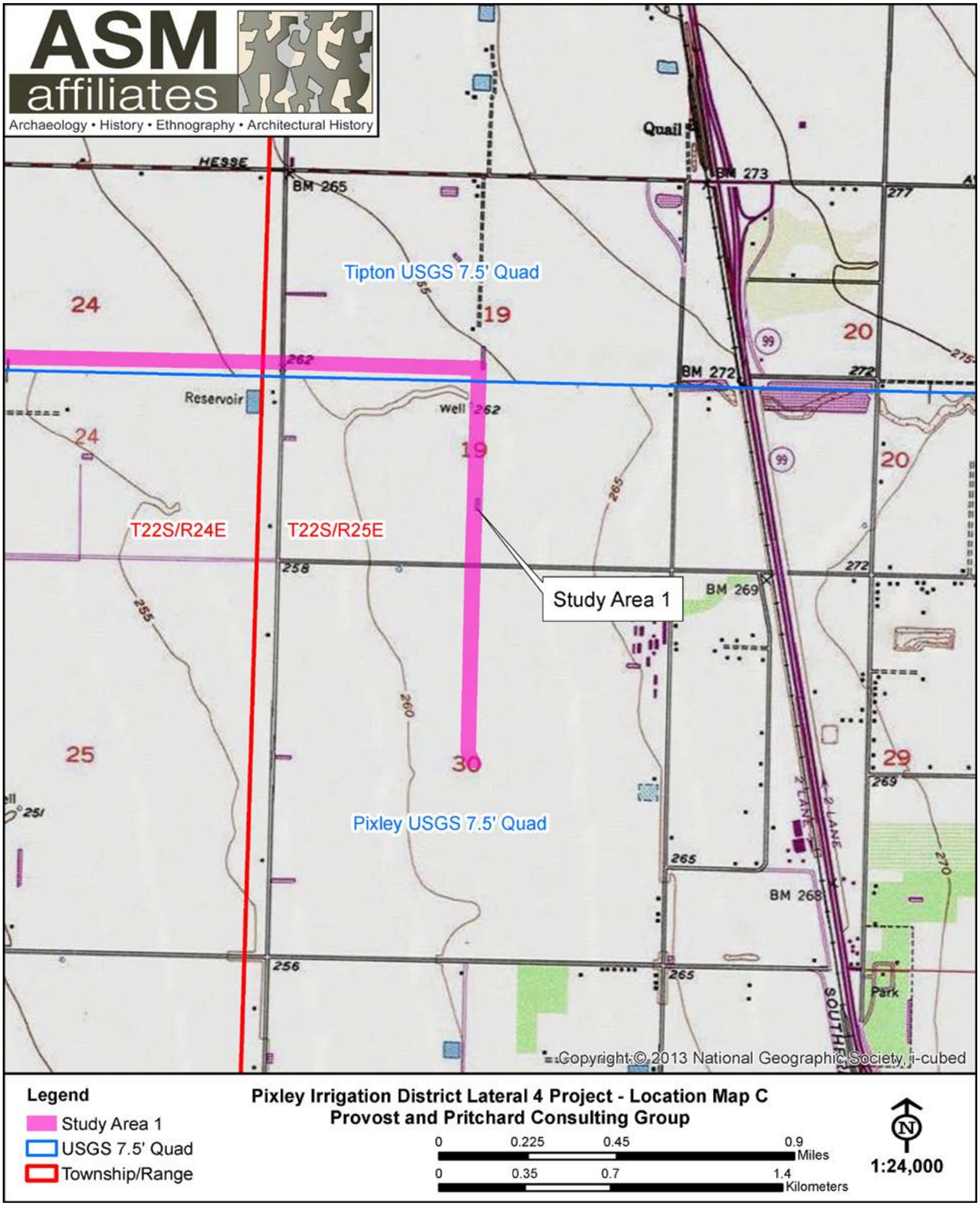

Figure 1.1d. Location of the PIXID Lateral 4 Project study areas, Tulare County, California. Map C.

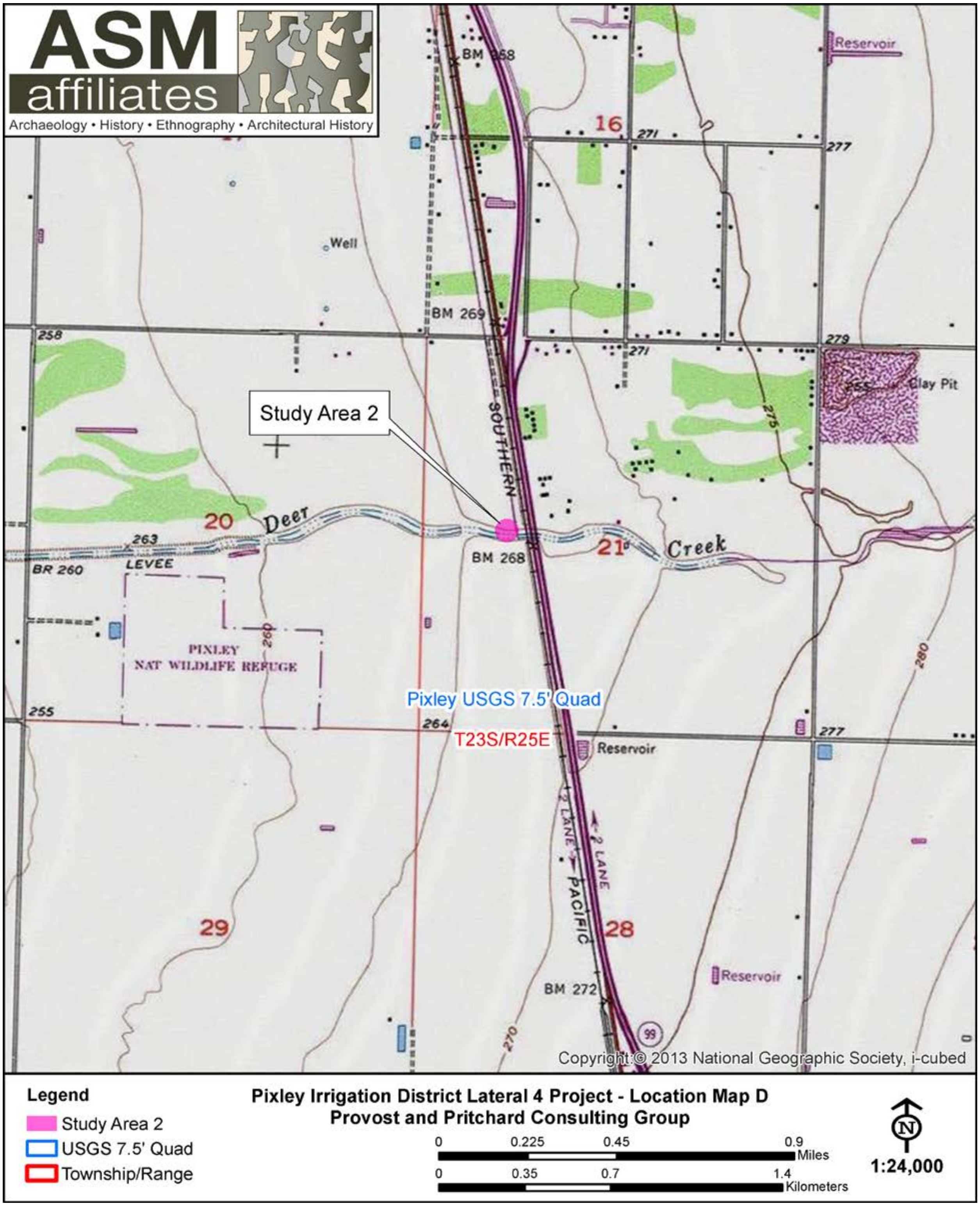

Figure 1.1e. Location of the PIXID Lateral 4 Project study areas, Tulare County, California. Map D.

2. ENVIRONMENTAL AND CULTUAL BACKGROUND

2.1 ENVIRONMENTAL BACKGROUND

At the time of the Class III Inventory/ Phase I survey, the study area consisted of active farm fields (Figure 2.1a and 2.1b). Although this location currently may be characterized as a dry open valley bottom, historically it may have been swampy, lying roughly 12-mi east of the historical Tule Lake shoreline. Prior to changes resulting from the agricultural development of the area, Deer Creek was an effective divide between mesic environments to the north and more xeric environments to the south (Preston 1981:80). Lying to the north of Deer Creek, the Project APE would have been on the wetter side of the Deer Creek alluvial fan. While Deer Creek may have been occasionally inundated by floodwaters during heavy spring snowmelt, in most years the drainage would have been perennial in its upper reaches and intermittent lower on its course (Preston 1981:17), near the APE.

Historical and recent land-use has thus changed the vegetation that was once present within and near the project area. Prior to development, oak groves and Tule marshlands would have dominated (Preston 1981:70). However, it is likely that Riparian Woodlands were once found along local drainages, including along Deer Creek. Although the project area may have included the Valley Grassland community, depending upon drainage and seasonal storm systems, freshwater marshes may have also been present (see Schoenherr 1992).

2.2 GEOARCHAEOLOGICAL CONTEXT

The project is located on the San Joaquin Valley flats, a deep basin that has been filled primarily with sediment originating in the Sierra Nevada to the east. More accurately, the project is located on the Deer Creek alluvial fan, which itself is broad and, in the immediate project area, gentle in slope. Preston (1981:17) describes the geomorphological and hydrological setting as follows:

> The lower distributaries and sloughs are barely deep enough to contain ordinary spring run-off, and localized flooding occurs annually. White River and Deer Creek are smaller still. Like the Tule [River], both are downcutting in their upper reaches, and both are barely perennial even in the foothills. White River and Deer Creek ordinarily disappear underground within ten to twelve miles of their entry into the basin, even during springtime, but occasional floods have carried their waters to Tulare Lake. The fans deposited by these streams are steeper than the Tule River fan.

The implications are, first, that the project area historically and prehistorically was a dynamic geomorphological environment, at least periodically, due to seasonal flooding. No records are known that allow us to estimate the impact this flooding may have had on the landscape but, due to changing climatic conditions prehistorically, this is likely to have varied over time, with greater dynamism occurring during wetter periods. The existing topography in the general region, however, provides some indication of how the landscape has been changed by seasonal flooding events. The 1892 “Thompson Map of Tulare County” shows the “Old Channel” of Deer Creek heading north from the current stream channel, creating what appears to have been an oxbow, to the east of the project area. The “Old Channel” is still shown on current USGS topographical quadrangles, and it apparently has not carried water for over a century. At some point in the past the stream straightened its course and eliminated this earlier, meandering course, suggesting that relatively recent hydrological events have been of sufficient magnitude to move the channel southwards to its current location. The course of the river, in other words, has been historically unstable, indicating that the current land-surface is youthful in age.

Second, this occasional flooding has sporadically inundated the area, depositing alluvial soils. Storie et al. (1942) characterize the Deer Creek region, in fact, as an outwash plain and describe the deposited soils as recent (and pedologically-undeveloped) sandy loam or fine sandy loam with permeable subsoils.

Third, while occasional flooding along Deer Creek has blanketed the area with alluvium, surface water was only present sporadically—during floods. As noted by Storie et al (1942:3), normal surface flows along Deer Creek effectively ended at Terra Bella, east of the study area.

Fourth, due to the limitations the lack of surface water had on prehistoric and historic human settlement, it is unlikely that the project area experienced more than sporadic human use prior to the Euro-American period. Earlier use most likely consisted of occasional hunting and gathering but not inhabitation. This supposition is supported by the distribution of known ethnographic villages, the closest of which was the Koyete Yokuts hamlet of *Chetetik Nowsuh* (Latta 1977:196). This is located on Deer Creek miles east of the project, near where the creek exits the foothills. Other ethnographic villages likewise are located primarily on streams near the foothills, or along the shores of Tulare Lake.

A Caltrans geoarchaeological study that included the PIXID Lateral 4 Project area classified this location as having Very Low to Medium sensitivity for subsurface sites, with the majority of the Project area rated Very Low (Meyer et al. 2010). This study involved first determining the location and ages of late Pleistocene (>25,000 years old) landforms in the southern San Joaquin Valley. These were identified by combining a synthesis of 2,400 published paleontological, soils and archaeological chronometric dates with geoarchaeological field testing. The ages of surface landforms were then mapped to provide an assessment for the potential for buried archaeological deposits. These ages were derived primarily from the Soil Survey Geographic Database (SSURGO) and the State Soils Geographic (STATSGO) database. A series of maps were created from this information that ranked locations in 7 ordinal classes for sensitivity for buried soils, from Very Low to Very High. Given its low to moderate sensitivity for buried deposits according to this analysis, and its distance from know centers of prehistoric occupation, it is unlikely that the Lateral 4 Project APE would contain subsurface archaeological deposits.

Based on these factors and conditions, the project area is considered to have a low to moderate archaeological sensitivity, with limited potential for subsurface archaeological remains.

Figure 2.1a. Project area overview, looking north.

Figure 2.1b. Project area overview, looking south.

2.3 ETHNOGRAPHIC CONTEXT

Penutian-speaking Yokuts tribal groups occupied the southern San Joaquin Valley region and much of the nearby Sierra Nevada. Ethnographic information about the Yokuts was collected primarily by Powers (1971, 1976 [originally 1877]), Kroeber (1925), Gayton (1930, 1948), Driver (1937), Latta (1977) and Harrington (n.d.). For a variety of historical reasons, existing research information emphasizes the central Yokuts tribes who occupied both the valley and particularly the foothills of the Sierra. The northernmost tribes suffered from the influx of Euro-Americans during the Gold Rush and their populations were in substantial decline by the time ethnographic studies began in the early twentieth century. In contrast, the southernmost tribes were partially removed by the Spanish to missions and eventually absorbed into multi-tribal communities on the Sebastian Indian Reservation (on Tejon Ranch), and later the Tule River Reservation and Santa Rosa Rancheria to the north. The result is an unfortunate scarcity of ethnographic detail on southern Valley tribes, especially in relation to the rich information collected from the central foothills tribes where native speakers of the Yokuts dialects are still found. Regardless, the general details of indigenous life-ways were similar across the broad expanse of Yokuts territory, particularly in terms of environmentally influenced subsistence and adaptation and with regard to religion and belief, which were similar everywhere.

This scarcity of specific detail is particularly apparent in terms of southern valley tribal group distribution. Kroeber (1925) places the Deer Creek area in Wowol territory, with the closest listed village at Porterville. Latta (1977:195-196) limits the Wowol on the eastern shore of Tulare Lake and on Atwell Island, with the Koyete on Deer Creek in the project area. As noted above, he identifies the closest Koyete village as *Chetetik Nowsuh*, near Terra Bella, east of the study area. Regardless of tribal affiliation, historical village distribution was similar across the region. Winter villages were typically located along lakeshores and major stream courses (as these existed circa AD 1800), with dispersal phase family camps located at elevated spots on the valley floor and near gathering areas in the foothills.

Most Yokuts groups, regardless of specific tribal affiliation, were organized as a recognized and distinct tribelet; a circumstance that almost certainly pertained to the tribal groups noted above. Tribelets were land-owning groups organized around a central village and linked by shared territory and descent from a common ancestor. The population of most tribelets ranged from about 150 to 500 peoples (Kroeber 1925).

Each tribelet was headed by a chief who was assisted by a variety of assistants, the most important of whom was the *winatum*, a herald or messenger and assistant chief. A shaman also served as religious officer. While shamans did not have any direct political authority, as Gayton (1930) has illustrated, they maintained substantial influence within their tribelet.

Shamanism is a religious system common to most Native American tribes. It involves a direct and personal relationship between the individual and the supernatural world enacted by entering a trance or hallucinatory state (usually based on the ingestion of psychotropic plants, such as jimsonweed or more typically native tobacco). Shamans were considered individuals with an unusual degree of supernatural power, serving as healers or curers, diviners, and controllers of natural phenomena (such as rain or thunder). Shamans also produced the rock art of this region, depicting the visions they experienced in vision quests believed to represent their spirit helpers and events in the supernatural realm (Whitley 1992, 2000).

The centrality of shamanism to the religious and spiritual life of the Yokuts was demonstrated by the role of shamans in the yearly ceremonial round. The ritual round, performed the same each year, started in the spring with the jimsonweed ceremony, followed by rattlesnake dance and (where appropriate) first salmon ceremony. After returning from seed camps, fall rituals began in the late summer with the mourning ceremony, followed by first seed and acorn rites and then bear dance (Gayton 1930:379). In each case, shamans served as ceremonial officials responsible for specific dances involving a display of their supernatural powers (Kroeber 1925).

Subsistence practices varied from tribelet to tribelet based on the environment of residence. Throughout Native California, and Yokuts territory in general, the acorn was a primary dietary component, along with a variety of gathered seeds. Valley tribes augmented this resource with lacustrine and riverine foods, especially fish and wildfowl. As with many Native California tribes, the settlement and subsistence rounds included the winter aggregation into a few large villages, where stored resources (like acorns) served as staples, followed by dispersal into smaller camps, often occupied by extended families, where seasonally available resources would be gathered and consumed.

Although population estimates vary and population size was greatly affected by the introduction of Euro-American diseases and social disruption, the Yokuts were one of the largest, most successful groups in Native California. Cook (1978) estimates that the Yokuts region contained 27 percent of the aboriginal population in the state at the time of contact; other estimates are even higher. Many Yokuts continue to live in Tulare, Fresno and Kings counties to this day.

2.3.1 Significant Themes

The ethnographic period in the southern San Joaquin Valley extended from first Euro-American contact, in AD 1772, to 1853, when tribal populations were first moved onto reservations. The major significant historic themes during this period of significance involve the related topics of Historic-Aboriginal Archaeology, and Native American Ethnic Heritage. More specifically, these concern the Adaptation of the Indigenous Population to Euro-American Encroachment and Settlement, and their Acculturation to Western Society. These processes included the impact of missionization on the San Joaquin Valley (circa 1800 to about 1845); the introduction of the horse and the development of a San Joaquin Valley “horse culture,” including raiding onto the coast and Los Angeles Basin (after about 1810); the use of the region as a refuge for mission neophyte escapees (after 1820); responses to epidemics from introduced diseases (especially in the 1830s); armed resistance to Euro-American encroachment (in the 1840s and early 1850s); and, ultimately, the adoption of the Euro-American society’s economic system and subsistence practices and acculturation into that society.

2.3.2 Associated Property Types

Site types that have been identified in the southern San Joaquin Valley in the general vicinity of the study area dating to the ethnographic period of significance primarily include villages and habitations, some of which contain cemeteries. The different social processes associated with this historical theme may be manifest in the material cultural record in terms of changing settlement patterns and village organization; the breakdown of traditional trading networks with their replacement by new economic relationships; changing subsistence practices, especially the introduction of agriculture initially via escaped mission neophytes; the use of Euro-American artifacts and materials rather than traditional tools and materials; and, possibly, changing mortuary practices.

Inasmuch as culture change is a primary intellectual interest in archaeology, ethnographic villages and habitations may be NRHP eligible under Criterion D, research potential. They may also be eligible under Criterion A, association with events contributing to broad patterns of history. Ethnographic sites, further, may be NRHP eligible as Traditional Cultural Properties due to potential continued connections to tribal descendants, and their resulting importance in traditional practices and beliefs, including their significance for historical memory, tribal- and self-identity formation, and tribal education. For Criteria A and D, eligibility requires site integrity (including the ability to convey historical association for Criterion A). These may include intact archaeological deposits for Criterion D, as well as setting and feel for Criterion A. Historical properties may lack physical integrity, as normally understood in heritage management, but still retain their significance to Native American tribes as Traditional Cultural Properties if they retain their tribal associations and uses.

2.4 PREHISTORIC BACKGROUND

The San Joaquin Valley region has received minimal archaeological attention compared to other areas of the state. In part, this is because the majority of California archaeological work has concentrated in the Sacramento Delta, Santa Barbara Channel and central Mojave Desert areas (see Moratto 1984). Although knowledge of the region's prehistory is limited, enough is known to determine that the archaeological record is broadly similar to south-central California as a whole (see Gifford and Schenk 1926; Hewes 1941; Wedel 1941; Fenenga 1952; Elsasser 1962; Fredrickson and Grossman 1977; Schiffman and Garfinkel 1981). Based on these sources, the general prehistory of the region can be outlined as follows.

Initial occupation of the region occurred at least as early as the *Paleoindian Period*, or prior to about 10,000 YBP (years before present). Evidence of early use of the region is indicated by characteristic fluted and stemmed points found around the margin of Tulare Lake, in the foothills of the Sierra, and in the Mojave Desert proper. (In each case, these are locations many miles distant from the study area.)

Both fluted and stemmed points are particularly common around the Tulare Lake margins, suggesting a terminal Pleistocene/early Holocene lakeshore adaptation similar to that found throughout the far west at the same time; little else is known about these earliest peoples. Over 250 fluted points have been recovered from the Witt Site (CA-KIN-32), located along the western shoreline of ancient Tulare Lake west of the Project APE, demonstrating the importance of this early occupation in the San Joaquin Valley specifically (see Fenenga 1993). Additional finds consist of a Clovis-like projectile point discovered in a flash-flood cut-bank near White Oak Lodge in 1953 on Tejon Ranch (Glennan 1987a, 1987b). More recently, a similar fluted point was found near Bakersfield (Zimmerman et al. 1989), and a number are known from the Edwards Air Force Base and Boron area of the western Mojave Desert. Although human occupation of the state is well-established during the Late Pleistocene, relatively little can be inferred about the nature and distribution of this occupation with a few exceptions. First, little evidence exists to support the idea that people at that time were big-game hunters, similar to those found on the Great Plains. Second, the western Mojave Desert evidence suggests small, very mobile populations that left a minimal archaeological signature. The evidence from the ancient Tulare Lake shore, in contrast, suggests a much more substantial population and settlements which, instead of relying on big game hunting, were tied to the lacustrine lake edge. Variability in subsistence and settlement patterns is thus apparent in California, in contrast to the Great Plains.

Substantial evidence for human occupation of California first occurs during the middle Holocene, roughly 7500 to 4000 YBP. This period is known as the *Early Horizon*, or alternatively as the Early Millingstone along the Santa Barbara Channel. In the south, populations concentrated along the coast with minimal visible use of inland areas. Adaptation emphasized hard seeds and nuts with tool-kits dominated by mullers and grindstones (manos and metates). Additionally, little evidence for Early Horizon occupation exists in most inland portions of the state, partly due to a severe cold and dry paleoclimatic period occurring at this time. Regardless of specifics, Early Horizon population density was low with a subsistence adaptation more likely tied to plant food gathering than hunting.

Environmental conditions improved dramatically after about 4000 YBP during the *Middle Horizon* (or Intermediate Period). This period known climatically as the Holocene Maximum (circa 3800 YBP) and was characterized by significantly warmer and wetter conditions than previously experienced. Archaeologically, it was marked by large population increase and radiation into new environments along coastal and interior south-central California and the Mojave Desert (Whitley 2000). In the Delta region to the north, this same period of favorable environmental conditions was characterized by the appearance of the Windmiller culture which exhibited a high degree of ritual elaboration (especially in burial practices) and perhaps even rudimentary mound-building tradition (Meighan, personal communication, 1985). Along with ritual elaboration, Middle Horizon times experienced increasing subsistence specialization, perhaps correlating with the appearance of acorn processing technology. Penutian speaking peoples (including the Yokuts) are also posited to have entered the state roughly at the beginning of this period and, perhaps to have brought this technology with them (cf. Moratto 1984). Likewise it appears the so-called "Shoshonean Wedge" in southern California or the Takic speaking groups that include the Gabrielino/Fernandeño, Tataviam and Kitanemuk, may have moved into the region at this time, rather than at about 1500 BP as first suggested by Kroeber (1925).

Evidence for Middle Horizon occupation of interior south-central California is substantial. For example, in northern Los Angeles County along the upper Santa Clara River, to the south of the San Joaquin Valley, the Agua Dulce village complex indicates occupation extending back to the Intermediate Period, when the population of the village may have been 50 or more people (King et al n.d.). Similarly, inhabitation of the Hathaway Ranch region near Lake Piru, and the Newhall Ranch near Valencia, appears to date to the Intermediate Period (W & S Consultants 1994). To the west, little or no evidence exists for pre-Middle Horizon occupation in the upper Sisquoc and Cuyama River drainages; populations first appear there at roughly 3500 YBP (Horne 1981). The

Carrizo Plain, the valley immediately west of the San Joaquin, experienced a major population expansion during the Middle Horizon (W & S Consultants 2004; Whitley et al. 2007), and recently collected data indicates the Tehachapi Mountains region was first significantly occupied during the Middle Horizon (W&S Consultants 2006). A parallel can be drawn to the inland Ventura County region where a similar pattern has been identified (Whitley and Beaudry 1991), as well as the western Mojave Desert (Sutton 1988a, 1988b), the southern Sierra Nevada (W & S Consultants 1999), and the Coso Range region (Whitley et al. 1988). In all of these areas a major expansion in settlement, the establishment of large site complexes and an increase in the range of environments exploited appear to have occurred sometime roughly around 4,000 years ago. Although most efforts to explain this expansion have focused on local circumstances and events, it is increasingly apparent this was a major southern California-wide occurrence and any explanation must be sought at a larger level of analysis (Whitley 2000). Additionally, evidence from the Carrizo Plain suggests the origins of the tribelet level of political organization developed during this period (W & S Consultants 2004; Whitley et al. 2007). Whether this same demographic process holds for the southern San Joaquin Valley, including the study area, is yet to be determined.

The beginning of the *Late Horizon* is set variously at 1500 and 800 YBP, with a consensus for the shorter chronology. Increasing evidence suggests the importance of the Middle-Late Horizons transition (AD 800 to 1200) in the understanding of south-central California. This corresponds to the so-called Medieval Climatic Anomaly, a period of climatic instability that included major droughts and resulted in demographic disturbances across much of the west (Jones et al. 1999). It is also believed to have resulted in major population decline and abandonments across south-central California, involving as much as 90 percent of the interior populations in some regions including the Carrizo Plain (Whitley et al. 2007). It is not clear whether site abandonment was accompanied by a true reduction in population or an agglomeration of the same numbers of peoples into fewer but larger villages. What is clear is that Middle Period villages and settlements were widely dispersed across the landscape; many at locations that lack contemporary evidence of fresh water sources. Late Horizon sites, in contrast, are typically located where fresh water was available during the historical period, if not currently.

One extensively studied site that shows evidence of intensive occupation during the Middle-Late Horizons transition (~1,500 – 500 YBP) is the Redtfeldt Mound (CA-KIN-66/H), located near the Santa Rosa Rancheria, northwest of the study area. There, Siefkin (1999) reported on human burials and a host of artifacts and ecofacts excavated from a modest-sized mound. He found that both Middle Horizon and Middle-Late Horizons transition occupations were more intensive than Late Horizon occupations, which were sporadic and less intensive (Siefkin 1999:110-111).

The subsequent Late Horizon can be best understood as a period of recovery from a major demographic collapse. One result is the development of regional archaeological cultures as the precursors to ethnographic Native California, suggesting that ethnographic life-ways recorded by anthropologists extend roughly 800 years into the past.

The position of San Joaquin Valley prehistory relative to patterns seen in surrounding areas is still somewhat unknown. The presence of large lake systems in the valley bottoms can be expected to have mediated some of the desiccation seen elsewhere. But, as the reconstruction of Soda Lake in the nearby Carrizo Plain demonstrates (see Whitley et al. 2007) environmental perturbations had serious impacts on lake systems too. Identifying certain of the prehistoric demographic trends for the southern San Joaquin Valley and determining how these trends (if present) correlate with those seen elsewhere, is a current important research objective.

2.4.1 Significant Themes

Previous research and the nature of the prehistoric archaeological record suggest two significant themes, both of which fall under the general *Prehistoric Archaeology* area of significance. These are the *Expansion of Prehistoric Populations and Their Adaptation to New Environments*; and *Adaptation to Changing Environmental Conditions*.

The *Expansion of Prehistoric Populations and Their Adaptation to New Environments* theme primarily concerns the Middle Horizon/Holocene Maximum. Its period of significance runs from about 4,000 to 1,500 YBP. It involves a period during which the prehistoric population appears to have expanded into a variety of new regions, developing new adaptive strategies in the process.

The *Adaptation to Changing Environmental Conditions* theme is partly related to the Holocene Maximum, but especially to the Medieval Climatic Anomaly. The period of significance for this theme, accordingly, extends from about 4,000 to 800 YBP. This theme involves the apparent collapse of many inland populations, presumably with population movements to better environments such as the coast. It is not yet known whether the southern San Joaquin Valley, with its system of lakes, sloughs and swamps, experienced population decline or, more likely, population increase due to the relatively favorable conditions of this region during this period of environmental stress.

2.4.2 Associated Property Types

Given the physiographic and hydrographic nature of the San Joaquin Valley (low-lying alluvial flats prehistorically containing streams, sloughs, swamps and lakes), two primary site types can be expected for both themes: villages and camps, and resource exploitation/special activity areas. Archaeological evidence potentially pertinent to these themes could include settlement locations and sizes, trade patterns, and especially subsistence evidence.

Prehistoric sites would be primarily eligible under NRHP Criterion D, research potential. Eligibility would require integrity in the form of intact archaeological deposits, including preserved stratigraphic relationships, internal site features, and artifact associations.

2.5 HISTORIC BACKGROUND

Spanish explorers first visited the southern end of the San Joaquin Valley in 1772, but its lengthy distance from the missions and presidios along the Pacific Coast delayed permanent settlement for many years, including during the Mexican period of control over the Californian region. In the 1840s, Mexican rancho owners along the Pacific Coast allowed their cattle to wander and graze in the San Joaquin Valley (JRP Historical Consulting 2009). The Mexican government granted the first ranchos in the southern part of the San Joaquin Valley in the early 1840s, but these did not result in permanent settlement. It was not until the annexation of California in 1848 that the exploitation of the southern San Joaquin Valley began (Pacific Legacy 2006).

The discovery of gold in northern California in 1848 resulted in a dramatic increase of population, consisting in good part of fortune seekers and gold miners, who began to scour other parts of the state. After 1851, when gold was discovered in the Sierra Nevada Mountains in eastern Kern County, the population of the area grew rapidly. Some new immigrants began ranching in the San Joaquin Valley to supply the miners and mining towns. Ranchers grazed cattle and sheep, and farmers dry-farmed or used limited irrigation to grow grain crops, leading to the creation of small agricultural communities throughout the valley (JRP Historical Consulting 2009).

After the American annexation of California, the southern San Joaquin Valley became significant as a center of food production for this new influx of people in California. The expansive unfenced and principally public foothill spaces were well suited for grazing both sheep and cattle (Boyd 1997). As the Sierra Nevada gold rush presented extensive financial opportunities, ranchers introduced new breeds of livestock, consisting of cattle, sheep and pig (Boyd 1997).

With the increase of ranching in the southern San Joaquin came the dramatic change in the landscape, as non-native grasses more beneficial for grazing and pasture replaced native flora (Preston 1981). After the passing of the Arkansas Act in 1850, efforts were made to reclaim small tracts of land in order to create more usable spaces for ranching. Eventually, as farming supplanted ranching as a more profitable enterprise, large tracts of land began to be reclaimed for agricultural use, aided in part by the extension of the railroad in the 1870s (Pacific Legacy 2006).

Following the passage of state wide ‘No-Fence’ laws in 1874, ranching practices began to decline, while farming expanded in the San Joaquin Valley in both large land holdings and smaller, subdivided properties. As the farming population grew, so did the demand for irrigation. Settlers began reclamation of swampland in 1866, and built small dams across the Kern River to divert water into the fields. By 1880, 86 different groups were taking water from the Kern River. Ten years later, 15 major canals provided water to thousands of acres in Kern County.

During the period of reclaiming unproductive land in the southern San Joaquin Valley, grants were given to individuals who had both the resources and the finances to undertake the operation alone. One small agricultural settlement, founded by Colonel Thomas Baker in 1861 after procuring one such grant, took advantage of reclaimed swampland along the Kern River. This settlement became the City of Bakersfield in 1869, and quickly became the center of activity in the southern San Joaquin Valley, and in the newly formed Kern County. Located on the main stage road through the San Joaquin Valley, the town became a primary market and transportation hub for stock and crops, as well as a popular stopping point for travelers on the Los Angeles and Stockton Road. The Southern Pacific Railroad reached the Bakersfield area in 1873, connecting it with important market towns elsewhere in the state, dramatically impacting both agriculture and oil production (Pacific Legacy 2006).

Three competing partnerships developed during this period which had a great impact on control of water, land reclamation and ultimately agricultural development in the San Joaquin Valley: Livermore and Chester, Haggin and Carr, and Miller and Lux, perhaps the most famous of the enterprises. Livermore and Chester were responsible, among other things, for developing the large Hollister plow (three feet wide by two feet deep), pulled by a 40 mule team, which was used for ditch digging. Haggin and Carr were largely responsible for reclaiming the beds of the Buena Vista and Kern lakes, and for creating the Calloway Canal, which drained through the Rosedale area in Bakersfield to Goose Lake (Morgan 1914). Miller and Lux ultimately became one of the biggest private property holders in the country, controlling the rights to over 22,000 square miles, and their impacts were widespread. They recognized early-on that control of water would have important economic implications, and they played a major role in the water development of the state. They controlled, for example, over 100 miles of the San Joaquin River with the San Joaquin and Kings River Canal and Irrigation System (http://en.wikipedia.org/wiki/Henry_Miller(rancher). They were also embroiled for many years in litigation against Haggin and Carr over control of the water rights to the Kern River. Descendants of Henry Miller continue to play a major role in California water rights, with his great grandson, George Nickel, Jr., the first to develop the concept of water banking, thus creating a system to buy and sell water (http://exiledonline.com/california-class-war-history-meet-the-oligarch-family-thats-been-scamming-taxpayers-for-150-years-and-counting/).

Numerous private irrigation systems were initially developed by individuals. The earliest such improvement in the general project area was the "Saucelito Ditch," which is shown on the 1892 "Thompson Map of Tulare County" running south of and parallel to Deer Creek. The Wright Act of 1887, however, allowed the creation of public irrigation districts, greatly facilitating the funding and construction of water conveyance systems. With increasing demand, the Central Valley Project (CVP) was developed to supply water to Fresno, Tulare and Kern counties. Friant Dam, which created Millerton Lake, was completed in 1942 and supplies water for the Friant-Kern and Madera Canals. The Friant-Kern Canal was constructed between 1945 and 1951 and is approximately 152 miles in length.

The Pixley Irrigation District was organized in 1958 to promote flood control on Deer Creek and to obtain supplemental water from the CVP for agricultural purposes using earth-lined canals and laterals to supply Friant-Kern Canal waters. Its East Main delivery system was created shortly after the formation of the district and the West Main delivery system was built in the mid-1970s (PID 2011). The current Project reflects an expansion of the West Main system to the northwest portion of the District.

2.5.1 Significant Themes

Theme 1: Development of Irrigated Agriculture in the San Joaquin Valley, 1852-1964

As identified by Caltrans in the *Water Conveyance Systems in California Historic Context Development and Evaluation Procedures*, the "Development of Irrigated Agriculture" is a historically significant theme or event in the history of California and the Central Valley region. In the years following California's statehood and the gold rush, increasing population created an increasing market for agricultural products. The total irrigated acreage in the state grew from 60,000 acres in 1860 to nearly 400,000 acres by 1880, an increase of more than 650 percent, and the San Joaquin Valley contained the highest percentage of that land (approximately 47 percent) (Caltrans 2000). Private water companies, land colonies, mutual water companies, and irrigation districts were established in the mid- to late nineteenth century to build irrigation systems to further develop the state's agriculture industry. Irrigation districts became the most influential of these organizations, especially after state legislation—the Wright Act of 1887—causing irrigation districts to grow in number, power, as well as the actual amount of irrigated land throughout the state. Forty-nine irrigation districts were organized between 1887 and 1896, most of them located between Stockton and Bakersfield. However, by the late 1920s, only seven of the original districts were still in existence, among them the Modesto, Turlock, and Tulare irrigation districts (Caltrans 2000). Under the impetus of increased demand during World War I, agricultural production reached a new peak in 1920. Companies like Pacific Gas & Electric and San Joaquin Valley Light and Power helped finance large irrigation reservoirs to feed district canals in return for the power generated. By 1930, there were 94 active districts in California, and the land watered by these agencies mushroomed to 1.6 million acres (Caltrans 2000). Irrigation districts provided more than 90 percent of the surface water used for irrigation in the San Joaquin Valley before the Central Valley Project came on line in the 1940s (Caltrans 2000). Most were located in the San Joaquin Valley, with the most successful in Modesto, Turlock, Merced, and Fresno.

The period of significance for this theme begins with the earliest developments of irrigated agriculture in the San Joaquin Valley, with the construction of the earliest earthen ditches in Visalia in 1852. Irrigated agriculture continues to be an important industry and influence in the Valley. The period of significance ends in 1964 following recommended guidance for closing a period of significance 50 years ago when activities continued to have importance, but no more specific date can be defined to end the historic period, and there is no justification for exceptional significance to extend the period of significance to an end date within the last 50 years (National Register of Historic Places 1997).

Associated Property Types:

Water Conveyance Systems

Following the framework established by Caltrans in *Water Conveyance Systems in California Historic Context Development and Evaluation Procedures*, the water conveyance system is the property type that has the potential to reflect this theme and period. Components and features of water conveyance systems include diversion structures, conduits, flow control devices, cleansing devices, and associated resources and settings. Water Conveyance Systems that are associated with Development of Irrigated Agriculture in the San Joaquin Valley, 1852-1964 will be eligible under NRHP Criterion A/CRHR Criterion 1 for their association with this significant theme if:

- the association with the theme is important--simply because a water conveyance existed during the period of significant is not enough for that system to be eligible;
- the resource retains high overall integrity because of the high number of comparable examples. The property should retain most of the seven aspects of integrity: location, design, setting, materials, workmanship, feeling, and association.
- Due to the nature of this type of resource, repairs and modifications are acceptable but not if those modifications substantially modified the resource.

Water Conveyance Systems that are associated with Development of Irrigated Agriculture in the San Joaquin Valley, 1852-1964 will be eligible under NRHP Criterion B/CRHR Criterion 2 for their association with this significant theme if they:

- associated with an important person's productive life ***and*** the property that is most closely associated with that person;
- the resource retains high overall integrity because of the high number of comparable examples. The property should retain most of the seven aspects of integrity: location, design, setting, materials, workmanship, feeling, and association.
- Due to the nature of this type of resource, repairs and modifications are acceptable but not if those modifications substantially modified the resource.

Water conveyance systems will rarely be found eligible under Criterion B. In California notable names for which there might be associations with water planning, construction, or engineering include: Anthony Chabot, George Chaffey, Frederick Eaton, William Mulholland, George Maxwell, Robert Marshall, Elwood Mead and C. E. Grunsky (Caltrans 2000).

Theme 2: Technological Innovation in Irrigated Agriculture in California, 1852-1964

Caltrans clearly defines the historic context for this theme in the "Legacy of Irrigation Canals" section of the context, while ASM has defined a period of significance based on the Caltrans context (Caltrans 2000). The below is a direct excerpt from the context:

The earliest irrigation water conveyances in California were roughly made, earthen ditches to divert water. Techniques used to construct irrigation canals have varied widely during the various periods of California's history, from the relatively short, hand-dug, early masonry and tile ditches, to horse-scraped and hand-dug earthen irrigation ditches, to the large concrete-lined, machine-formed irrigation canals of the middle decades of the twentieth century. Evidence of these changes in scale, methods of construction, and knowledge of engineering are reflected in the remaining physical resources found on the landscape today. Substantial regional variation exists with respect to the adoption and dissemination of the new technologies, such as where and when concrete replaced wood in the engineering works of major irrigation canals. These regional differences can be explained in part by cultural traditions with respect to water management, ownership of water rights, and environmental factors, but economics, politics, and the formation of particular types of irrigation institutions also played a significant role.

Older canals were often subject to substantial change over time. A common change was to expand the system in order to serve more acreage. Unless pumps are used, irrigation canals rely on gravity to move water, and they can provide service only to land lying below the canal's water level. As irrigated acreage expanded, water companies frequently consolidated smaller ditch systems, moved the point of diversion upstream, and built a high-line canal to service new acreage. In this manner, pioneer canals were often absorbed into larger systems, frequently by irrigation districts, to pull in more potentially irrigable lands. Segments of earlier irrigation systems might remain largely intact within the larger framework of a new irrigation system, or the changes could be such that the old separate irrigation system would become, in essence, a typical component of a new 1920s irrigation district canal.

Another important factor is that water is notoriously difficult to control; it can be, and frequently is, an engine of destruction. Flood waters, for example, repeatedly overwhelmed the flimsy wooden control structures built on nineteenth and early-twentieth century irrigation systems in the San Joaquin Valley. Canals required periodic maintenance and were also often altered as a result of improvements designed to counteract the normal erosion that occurs from water moving through earth-lined canals. Improvements to stabilize canals ranged from realigning segments of the channel, to lining ditches or putting them in pipe, to replacement of checks, drops, culverts, or other regulation structures. These improvements were sometimes carried out system-wide, sometimes on a piecemeal basis. In light of the proclivity for change and the wide diversity of canal materials and modes of construction, adequate documentary research is essential to understand the evolution of an important irrigation canal and to assess its integrity (Caltrans 2000).

The period of significance for this theme begins with the earliest developments of irrigated agriculture in the San Joaquin Valley, with the construction of the earliest earthen ditches in Visalia in 1852. Technological innovations in agricultural irrigation are ongoing, but the period of significance ends in 1964 following recommended guidance for closing a period of significance 50 years ago when activities continued to have importance, but no more specific date can be defined to end the historic period, and there is no justification for exceptional significance to extend the period of significance to an end date within the last 50 years (National Register of Historic Places 1997).

Associated Property Types:

Water Conveyance Systems

Following the framework established by Caltrans in *Water Conveyance Systems in California Historic Context Development and Evaluation Procedures*, the water conveyance system is the property type that has the potential to reflect this theme and period. Components and features of water conveyance systems include diversion structures, conduits, flow control devices, cleansing devices, and associated resources and settings. Water Conveyance Systems that are associated with Technological Innovation in Irrigated Agriculture in California, 1852-1964 will be eligible under NRHP Criterion C/CRHR Criterion 3 for their association with this significant theme if they are/have:

- unique values;
- the best or good example of the property type as one that possess distinctive characteristics of the type and through those characteristics clearly illustrates at least one of the following;
  - the pattern of features common to a particular class of resources
  - the individuality or variation of features that occurs within the class;
  - the evolution of that class; or
  - the transition between classes of resources
- the earliest, best preserved, largest, or sole surviving example of particular types of water conveyance systems;
- a design innovation of evolutionary trends in engineering
- designed by a figure of acknowledged greatness in the field or by someone unknown whose workmanship is distinguishable from others by its style and quality ***and*** be a good example of that designer's work;

- the resource retains high overall integrity because of the high number of comparable examples. The property should retain most of the seven aspects of integrity: location, design, setting, materials, workmanship, feeling, and association.

A large water conveyance system with multiple components will often be evaluated as a district rather than as a single property. An eligible historic district must possess a significant concentration or linkage of resources that are united historically or aesthetically by plan or physical development. It should be a significant and distinguishable entity, although its components need not possess individual distinction (Caltrans 2000).

3. ARCHIVAL RECORDS SEARCH

An archival records search was conducted at the California State University, Bakersfield, Southern San Joaquin Valley Archaeological Information Center (AIC), by AIC staff members to determine: (i) if prehistoric or historical archaeological sites had previously been recorded within the study area; (ii) if the project area had been systematically surveyed by archaeologists prior to the initiation of this field study; and/or (iii) whether the region of the field project was known to contain archaeological sites and to thereby be archaeologically sensitive. Additionally, a search of the NAHC *Sacred Lands File* was conducted in order to ascertain whether traditional cultural places or cultural landscapes had been identified within the APE. The results of this archival records search are summarized here.

According to the IC records, five previous surveys have been completed within the Project APE which had covered small portions of it (Table 3.1). These surveys did not result in the recording of cultural resources within the Project APE. An additional five previous archaeological surveys had been conducted within 0.5 mi of the APE (Table 3.2), resulting in the recording of four cultural resources within that radius (Table 3.3). A map of previous reports and recorded cultural resources in and around the study area is presented in Confidential Appendix A.

Table 3.1. Survey reports within the APE

Report No.	Year	Author (s)/Affiliation	Title
TU-00102	1995	B Hatoff et al/ Woodward-Clyde Consultants	Cultural Resources Inventory Report for the Proposed Mojave Northward Expansion Project
TU-00103	1997	B Wickstrom and e Anderson/ JKEA Environmental, Inc.	Cultural Resource Survey for the Selma to Bakersfield Fiberoptic Line, Southern San Joaquin Valley, California
TU-00249	1989	RJ Cantwell/ Individual Consultant	Archeological and Historical Survey Report: Road 96 From Avenue 88 to Avenue 120, Tulare County
TU-00551	1984	G Weinberger/ Porterville College	Archaeological Reconnaissance of Pixley Irrigation District
TU-01219	2004	R Baloain/ Applied EarthWorks, Inc.	Cultural Resources Survey of a Proposed School Site Near Porterville In Tulare County, California

Table 3.2. Survey reports within 0.5-mi the APE

Report No.	Year	Author (s)/Affiliation	Title
TU-00209	1978	RJ Cantwell/ Individual Consultant	Archaeological and Historical Survey Report for Sherwood Homes, Western Skies Subdivision, Porterville
TU-00753	1998	SS Flint/ Applied EarthWorks, Inc.	Phase-1 Archaeological Survey for the Lower Tule and Pixley Irrigation Districts Distribution Systems Project, Tulare County, California
TU-00754	1998	SS Flint/ Applied EarthWorks, Inc.	Sensitivity Analysis of Cultural Resources within the Lower Tule and Pixley Irrigation Districts, Lower Tule and Pixley Irrigation Districts Distribution Systems Project, Tulare County, California
TU-01009	1997	R Gerry and J Oglesby/ Peak & Associates, Inc.	Cultural Resources Assessment of the Proposed Water Supply Improvements for the Pixley and Kern National Wildlife Refuges, Kern and Tulare Counties, California
TU-01324	2006	C Arrington et al/ SWCA Environmental Consultants	Cultural Resources Final Report of Monitoring and Findings for the Qwest Network Construction Project, State of California

Table 3.3. Resources within 0.5-mi of the APE

Primary #	Type	Description
P-54-002191	Structure	Historic Bridge Crossing
P-54-002192	Structure	Historic Bridge Crossing
P-54-004626	Structure	Historic Southern Pacific Railroad
Bridge 46-147L	Non-Resource	Hwy 99 Bridge

(Note that the IC results letter [Confidential Appendix A] indicates that two cultural resources are within the Project APE. This statement is a clerical error; the mapped locations of these resources are outside of the 0.5-mi records search radius.)

A records search was also conducted at the Native American Heritage Commission (NAHC) Sacred Lands File (Confidential Appendix A). No sacred sites or tribal cultural resources were known in or in the vicinity of the study area. Outreach letters were then sent to the tribal contact list provided by the NAHC. One response, by phone call, was received from Mr. Kenneth Woodrow, Chair of the Wuksache Indian Tribe – Eshom Valley Band. He expressed concern for potential buried cultural resources, based on his experience with the High-Speed Rail project. Mr. Woodrow was directed to the Caltrans geoarchaeological study (Meyers et al. 2010) which identifies the buried sensitivity of the Project APE. Follow-up phone calls were also made to other groups on the contact list. No other responses were received from any of the contacts, presumably indicating that there are no additional tribal concerns over the Project.

4. METHODS AND RESULTS

The project consists of the construction of an approximately 6-mi long ditch (portions of which may involve buried pipelines; e.g., in road crossings); a recharge basin to be selected from two alternatives that, together, total 20-acres; and retrofitting an existing check-structure on Deer Creek with a bladder valve.

The study area was examined with the field crew walking parallel transects along the pipeline route and recharge basin area spaced at 15 meter intervals, in order to identify surface artifacts, archaeological indicators (e.g., shellfish or animal bone), and/or archaeological deposits (e.g., organically enriched midden soil); tabulation and recording of surface diagnostic artifacts; site sketch mapping; preliminary evaluation of site integrity; and site recording, following the California Office of Historic Preservation Instructions for Recording Historic Resources, using DPR 523 forms. A buffer 50 feet wide was included on each side of the pipeline route. Because the route primarily follows existing paved and unpaved roads, this resulted in survey on both sides of the roads.

Special attention was paid to rodent burrow back dirt piles, in the hope of identifying sub-surface soil conditions that might be indicative of archaeological features or remains. No cultural resources were collected during the survey.

The study area was surveyed by ASM Associate Archaeologist Rob Azpitarte, B.A., Crew Chief, with the help of ASM Assistant Archaeologists Stacey Escamilla, B.A., Tim Polkinghorne, B.A., and Jennifer Heffler, B.A. Fieldwork was conducted in April, 2019. Soils throughout the study area are sandy-silty alluvium with very few lithic clasts, reflecting a soils origin in deltaic processes. The study area consists of existing, previously disturbed paved and unpaved roads with agricultural land consisting primarily of field crops and orchards. Surface visibility was good to excellent throughout the Project APE.

ASM conducted limited archival research to assess the eligibility of any identified resources. ASM reviewed Caltrans's *Water Conveyance Systems in California Historic Context Development and Evaluation Procedures* (Caltrans 2000). Recommendations of eligibility were based on ASM's assessment of integrity and the eligibility framework established by Caltrans in that historic context document, as well as previous recommendations for identified resources, where available. Historic USGS topographic maps from historicaerials.com and other historic maps were reviewed as necessary to assess the historical alignment of any linear resources in the Project area.

4.1 INVENTORY RESULTS

The ditch route crossed four paved roads (Elk Bayou Road, Road 96, Road 104 and Road 112). The southern terminus of this route is at the West Main Canal which is a post-1970s addition to the PIXID water conveyance system (PIXID 2011) and was therefore not recorded as a cultural resource. No resources were identified in the two alternative recharge basins. One historical resource was identified during the Class III inventory/Phase I survey: a new segment of previously recorded Deer Creek and an existing check-structure within the segment. A retrofit is proposed for this check-structure as Phase 2 of the proposed Project. A site record form for this resource is included in Confidential Appendix B.

No additional cultural resources of any kind were identified during the Class III inventory/Phase I survey.

4.1.1 Deer Creek

Deer Creek is a natural stream that serves as a PIXID water conveyance system. It was channelized after 1958, when the PIXID was formed, most likely in the mid-1970s. A segment of this resource, including a check-structure, was recorded by ASM Affiliates in 2014 for the South Valley Water Banking Authority project (ASM Affiliates 2014). It was determined not eligible for the NRHP/CRHR at that time.

The segment recorded during the current study consists of the check-structure and a segment of the stream extending 150-ft east-west and 100-ft north-south. This segment and structure are located immediately west of a rail crossing and the Highway 99 crossing of Deer Creek, in Tulare County, California. A lateral of the West Main Canal enters Deer Creek between the recorded stream segment and the rail bridge. Elevation of this segment is approximately 248-ft asml.

The recorded segment of Deer Creek includes earthen levees and a check structure (Feature 1). Deer Creek was flowing at the time of the survey and its profile and depth could not be determined. It is however earthen-bottomed and -sided, with earthen levees serving as farm roads, on either side of the creek. These have likely increased in height over time with periodic stream maintenance. Concrete rubble/rip-rap was present on the southwest/downstream side of the stream bank, adjacent to the check-structure. The upstream side of the stream, from the check-structure, had an introduced-grasses cover. Riparian vegetation was present on the sides of the bank downstream of the structure. It was apparent, however, that periodic vegetation removal has occurred, altering the visual characteristics of the stream course.

The check-structure is a concrete, steel and wood construction and measures 100-ft (north-south) by 22-ft (east-west), with the wood consisting of a series of parallel boards providing a narrow vehicle-crossing over Deer Creek (Figure 3). The structure was in operation at the time of the survey. An inscription on the northwestern concrete wall of the structure reads “AG” and “76” below it, suggesting a construction date of 1976. Based on historic aerials, the Deer Creek bridge crossing was constructed after 1969 but before 1994, supporting the 1976 construction date.

Figure 4.1. Check-structure on recorded segment of Deer Creek showing farm crossing, looking southwest.

5. SUMMARY, NRHP ELIGIBILITY EVALUATION, AND RECOMMENDATIONS

An intensive Class III inventory/Phase I cultural resources survey was conducted for the Pixley Irrigation District Lateral 4 Project, near Pixley, Tulare County, California. The area of potential effect for the project was defined as all ground-surface disturbance along with staging, lay-down and work areas. This included an approximately 6-mi long ditch corridor that was 100-ft wide (portions of which may include underground pipelines); two alternative recharge basins totaling 20-acres in size, plus 100-ft buffers; and a proposed retrofit to a check-structure at Deer Creek, within an APE measuring 100 by 100-ft. The horizontal APE is approximately 94-acres (ac) in total size. The vertical APE, defined as the maximum depth of excavation, was 10-ft.

Records searches were also conducted at the CSUB CHRIS Information Center and the Native American Heritage Commission Sacred Land Files. No previously recorded cultural or tribal resources were known within or adjacent to the Project APE. Letters and follow-up calls were also made to tribal organizations on the NAHC contact list. No additional tribal cultural resources were identified by that effort.

One cultural resource, a segment of Deer Creek with a check-structure, was identified and documented during the study. A different segment of Deer Creek was first recorded in 2014 and was determined not NRHP or CRHR eligible.

5.1 EVALUATION OF DEER CREEK

The section of the Deer Creek documented within the PIXID Lateral 4 Project APE is recommended not eligible for the NRHP or CRHR either individually nor as a contributor to a potential historic district under all four NRHP/CRHR criteria. No eligible historic district was identified to which the creek would be a contributor. Under consideration of individual eligibility, the section of Deer Creek surveyed has the potential for association with events that have made a significant contribution to the broad patterns of history, specifically the Development of Irrigated Agriculture in the San Joaquin Valley, 1852-1964. This theme begins with the earliest developments of irrigated agriculture in the San Joaquin Valley and extends up to a period of 50 years ago. As a minor conduit, it does not have an important association with this significant theme. Deer Creek is recommended not eligible under NRHP/CRHR Criteria A/1.

No historically significant individuals were identified that were associated with Deer Creek. Deer Creek is recommended not eligible under NRHP/CRHR Criteria B/2.

The section of Deer Creek surveyed for this Project has the potential for eligibility under the theme of Technological Innovation in Irrigated Agriculture in California, 1852-1964. This theme begins with the earliest technological innovations in agricultural irrigation in California and extends up to a period of 50 years ago. However, Deer Creek does not appear to have unique values, is not a good example of the property type as a minor feature of a water conveyance, is not the earliest, best preserved, largest, or sole surviving example of the water conveyance property type; nor is it a design innovation of evolutionary trends in engineering. Furthermore, the creek has no known association with a figure of acknowledged greatness in the design field or by someone unknown whose workmanship is distinguishable from others by its style and quality. Deer Creek is recommended not eligible under NRHP/CRHR Criteria C/3.

Finally, Deer Creek is not recommended eligible under NRHP/CRHR Criteria D/4. It is a common property type that does not have the potential to provide information about history or prehistory that is not available through historic research.

Based on the above considerations, we concur with the previous determination that the segment of Deer Creek and its check-structure within the Lateral 4 Project APE is not NRHP/CRHR eligible.

5.2 RECOMMENDATIONS

An archival records search, background studies, and an intensive, on-foot surface survey of the PIXID Lateral 4 Project study area, Tulare County, California, were conducted as part of a Class III inventory/ Phase I archaeological survey. One cultural resource, a segment of Deer Creek including a check-structure proposed for retrofitting, was identified and documented during the survey. This resource is recommended as not NRHP/CRHR eligible.

The proposed Lateral 4 Project therefore does not have the potential to result in adverse effects to historical properties or resources, and no additional archaeological work is recommended for it. It is recommended that an archaeologist be contacted in the unlikely event that archaeological resources are discovered during the construction or use of the pipeline and other project facilities and features.

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CONFIDENTIAL APPENDICES