KAWEAH DELTA WATER CONSERVATION DISTRICT

RIVER/STREAM MAINTENANCE PROJECT

DRAFT INITIAL STUDY/MITIGATED NEGATIVE DECLARATION

TULARE AND KINGS COUNTY
MARCH 2025

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Kaweah Delta Water Conservation District

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APPENDICES

Appendix A- Biological Resources Evaluation
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ACRONYMS & ABBREVIATIONS

AB ---------- Assembly Bill
APE ---------- Area of Potential Effect
BMP ---------- Best Management Practices
CARB ---------- California Air Resources Board
CCAA ---------- California Clean Air Act
CDFW ---------- California Fish and Wildlife
CEQA ---------- California Environmental Quality Act
CH_4 ---------- Methane
CHRIS ---------- California Historical Resources Information System
CNDDB ---------- California Natural Diversity Database
CNPS ---------- California Native Plant Society
CO ---------- Carbone Monoxide
CO_2 ---------- Carbon dioxide
County ---------- Tulare/Kings County
District ---------- Kaweah Delta Water Conservation District
DOC ---------- Department of Conservation
DTSC ---------- Department of Toxic Substances Control
EIR ---------- Environmental Impact Report
EOP ---------- Emergency Operations Plan
FEMA ---------- Federal Emergency Management Agency
FMMP ---------- Farmland Mapping and Monitoring Program
GHG ---------- Greenhouse Gas
GWP ---------- Global Warming Potential
IPaC ---------- U.S. Fish and Wildlife Service's Information for Planning and Consultation system
IS ---------- Initial Study
IS/MND ---------- Initial Study/Mitigated Negative Declaration
KDWCD ---------- Kaweah Delta Water Conservation District
MMRP ---------- Mitigation Monitoring and Reporting Program
MND ---------- Mitigated Negative Declaration
NAAQS ---------- National Ambient Air Quality Standards
NAHC ---------- Native American Heritage Commission
ND ---------- Negative Declaration
NO_2 ---------- Nitrogen dioxide
NRCS ---------- Natural Resources Conservation Service
NRHP ---------- National Register of Historic Places
OES ---------- Office of Emergency Services
O_3 ---------- Ozone
Pb ---------- Lead
PM_{10} ---------- particulate matter 10 microns in size
$PM_{2.5}$ ---------- particulate matter 2.5 microns in size
ppb ---------- parts per billion
ppm ---------- parts per million
Project ---------- River/Stream Maintenance Project
RWQCB ---------- Regional Water Quality Control Board
SJVAB ---------- San Joaquin Valley Air Basin
SJVAPCD ---------- San Joaquin Valley Air Pollution Control District
SO_2 ---------- Sulfur Dioxide

SSJVIC---------- Southern San Joaquin Valley Information Center
SR---------- State Route
SWPPP---------- Storm Water Pollution Prevention Plan
SWRCB ---------- State Water Resources Control Board
USACE ---------- United States Army Corps of Engineers
USDA---------- United States Department of Agriculture
USEPA ----------United States Environmental Protection Agency
USFWS---------- United States Fish and Wildlife Service
USGS ----------United States Geological Survey
µg/m3 ---------- micrograms per cubic meter

CHAPTER 1 INTRODUCTION

Provost & Pritchard Consulting Group (Provost & Pritchard) has prepared this Initial Study/Mitigated Negative Declaration (IS/MND) on behalf of the Kaweah Delta Water Conservation District (District) to address the potential environmental effects of the River/Stream Maintenance Project (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 Project.

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

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 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 six chapters Chapter 1 Introduction, provides an overview of the Project and the CEQA process Chapter 2 Project Description, provides a detailed description of proposed Project components and objectives. Chapter 3 Determination, the Lead Agency's determination based upon this initial evaluation. Chapter 4 Environmental Impact Analysis presents the CEQA checklist and environmental analysis for all impact areas, mandatory findings of significance, and feasible mitigation measures. If the 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 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 5 Mitigation, Monitoring, and Reporting Program (MMRP), provides the proposed mitigation measures, implementation timelines, and the entity/agency responsible for ensuring implementation. Chapter 6 References details the documents and reports this document relies upon to provide its analysis.

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

CHAPTER 2 PROJECT DESCRIPTION

2.1 PROJECT BACKGROUND

2.1.1 PROJECT TITLE

River/Stream Maintenance Project

2.1.2 LEAD AGENCY NAME AND ADDRESS

Kaweah Delta Water Conservation District
2975 North Farmersville Boulevard
Farmersville, CA 93223

2.1.3 CONTACT PERSON AND PHONE NUMBER

Luis Verdugo
District Engineer
(559) 747-5601

2.1.4 CEQA CONSULTANT

Provost & Pritchard Consulting Group
Ryan McKelvey, Environmental Project Manager
(559) 636-1166

2.1.5 PROJECT LOCATION

The Project is located within District's boundary and sphere of influence, which encompass approximately 340,343 acres. See Figure 2-1. The Project includes maintenance of approximately 209 miles of rivers, streams, creek and sloughs that are tributaries or distributaries to the Kaweah River lying within both Tulare and Kings Counties at an average elevation of approximately 297 feet above mean sea level.

The District's jurisdiction spans the Kaweah River system and all tributaries and distributaries throughout western Tulare County and eastern Kings County. The District's northeastern boundary is further defined as commencing downstream of Lake Kaweah, just west of McKay Point in Tulare County. The specific Project location will include areas found within the channels of the Kaweah River system and within the District's boundaries. Most of the land within the District is utilized for agricultural production; the remainder is urbanized, including the cities of Visalia, Tulare, Woodlake, Hanford, Exeter, and Farmersville and unincorporated communities such as Goshen and Ivanhoe.

Flows within the Project area are primarily dependent upon irrigation and flood control releases from Terminus Dam at Lake Kaweah, which often leaves the rivers and streams completely dry during non-irrigation season. This dry period can extend from late summer through spring, except for controlled flood releases. During periods of extended drought, most of the river system is dry year-round. On the contrary, during record high-water years, the river system may flow perennially.

2.1.6 DESCRIPTION OF THE PROJECT

2.1.6.1 PROJECT BACKGROUND AND PURPOSE

For several decades, the District has been performing routine maintenance activities within the Kaweah River System as part of their ongoing operations of flood-control maintenance. The maintenance activities proposed by the Project do not involve new construction, expansion, or alteration of existing structures, but rather include longstanding and ongoing maintenance activities that protect downstream properties and allow the channels to serve the function of flood control. The Project area encompasses approximately 209 miles of rivers, streams, creeks, and sloughs that are tributaries or distributaries to the Kaweah River within Tulare and Kings Counties, California as illustrated in Table 2-1 and Figure 2-3. An Initial Study/Mitigated Negative Declaration was adopted by the District on February 5, 2019. Due to updates to biological resources sensitive species, a new Biological Resources evaluation was prepared for this Project, and therefore a new Initial Study/Mitigated Negative Declaration has been prepared.

2.1.6.2 PROJECT DESCRIPTION

The Project consists of routine channel maintenance within the Kaweah River system in Tulare and Kings Counties for the purpose of flood control. Living and dead vegetation, accumulations of sand and sediment, and debris will be removed from within the channel and along each bank. Over-hanging limbs, invasive vegetation, hazardous or dead trees, and other debris will be removed. Heavy equipment such as excavators, bulldozers, skidsteers, dump trucks, and loaders will be utilized. Chainsaws and other hand-held equipment will be used to trim and remove vegetation. Vegetation is then removed from the site or left to decompose naturally after being placed a safe distance from water features.

Herbicide will be applied via commercial-grade spray equipment to control weedy vegetation along the channel banks. Repairs and maintenance will be conducted to existing flow control, erosion control, and measurement structures. The Project does not propose de-watering of channels as most work will be completed during low-flow or while the streambed is dry.

The District is currently performing routine maintenance activities within the Kaweah River under provisions of an existing LSA Agreement with the California Department of Fish and Wildlife (CDFW). The term of the existing Agreement ends in June 2025. At this time, the District is seeking a new long-term LSA Agreement with CDFW in order to continue maintenance activities. No substantial changes or alterations in the provisions of the agreement are proposed.

2.1.6.3 DEFINITIONS

The following definitions shall govern wherever the defined terms appear within this report:

2.1.7a: Kaweah River System: The Kaweah River, commencing immediately downstream of the afterbay adjacent to the lower portion of Terminus Dam, Tulare County, California, and continuing downstream in said river and of its distributaries, to the District's western boundary, together with portions of certain tributaries to said river, encompassing approximately 209 miles of rivers, creeks, and sloughs, including associated banks, beds, channels, waterways, and areas associated therewith used by the District for routine maintenance activities, and as more particularly described in Table 2-1 below and Figure 2-3.

Table 2-1: Kaweah River System

Kaweah River System				
River/Creek	From	To	Miles	Type
Bates Slough	Road 66	Avenue 168	5.6	2
Cameron Creek	TID Canal	Mooney's Grove	7.8	2
Cottonwood Creek	Avenue 30	Cross Creek	5.2	2
Cross Creek	St. Johns River	Turner Weir	35.4	1

Kaweah River System				
River/Creek	From	To	Miles	Type
Davis Slough	Outside Creek	Inside Creek	5.5	2
Deep Creek	Lower Kaweah River	Avenue 168	4.2	1
Dry Creek		Kaweah River	1.0	1
Elbow Creek	Road 112	Road 132	4.4	2
Elk Bayou	Outside Creek	District Boundary	13.4	1
Inside Creek	Outside Creek	Elk Bayou	4.7	2
Johnson Slough	Road 180	Road 192	2.2	2
Kaweah River	Terminus Afterbay	McKay Point	2.8	1
Lewis Creek	Road 164	Outside Creek	3.2	2
Lower Deep Creek	Road 160	Road 130	5.1	2
Lower Kaweah River	McKay Point	Mill Creek	11.9	1&2
Mill Creek	Lower Kaweah River	Cross Creek	24.9	2
North Mill Creek	Mill Creek	Cross Creek	10.5	2
Outside Creek	Lower Kaweah River	Elk Bayou	17.4	1
Packwood Creek	Lower Kaweah River	Tagus Basin	14.8	2
St. Johns River	McKay Point	Cross Creek	27.2	1
Yokohl Creek	District Boundary	Outside Creek	1.7	1
		Total	208.9	

2.1.7b: Channel Banks, Channel Bottoms, and Other Appurtenant Features: Areas within the channel prism that are more particularly described in Figure 2-4 and Figure 2-5.

2.1.7c: Debris: Trash, tires, downed trees, logs, and branches.

2.1.7d: Diameter at Breast Height (DBH): Diameter of a tree trunk at a point measured 4.5-feet from the base of the trunk at ground level.

2.1.7e: Emergency: As defined in the Public Resources Code Section 21060.3: a sudden, unexpected occurrence, involving a clear and imminent danger, demanding immediate action to prevent or mitigate loss of, or damage to, life, health, property, or essential public services.

2.1.7f: Low-flow: Flow in the channel that meets either of the following criteria:

a. Any flow of water with a depth of 1-foot or less, measured from the bottom of the channel.
b. Any flow of water less than 15-cubic feet per second (cfs) with a depth of greater than 1-foot, measured from the bottom of the channel.

2.1.7g: Maintenance Activities: Routine activities performed by the District's maintenance crews, contractors, or agents, which are more particularly described in the Project Description.

2.1.7h: Routine Maintenance: Activities performed by the District's maintenance crews, contractors, or agents which are defined in the Project Description, which includes work that is performed regularly (i.e. every 1 to 5 years) in the Stream Channels as identified in Figure 2-4 and Figure 2-5. The District performs Routine Maintenance to maintain the functional and structural integrity of its facilities for the purpose of flood control. Routine Maintenance includes, but is not limited to the following activities:

- Removal of debris, sediment, vegetation, downed trees, and other materials that could obstruct the natural flow of a drainage; controlling weeds, grasses, emergent vegetation, and woody vegetation; repairing gates, barricades, culverts, and small structures; bank stabilization; and erosion control.

2.1.7i: Special Status Species: Any species defined in California Code of Regulations Section 15380; species that are fully protected pursuant to the FGC; species protected pursuant to the Migratory Bird Treaty Act; and/or species identified by CDFW or other State or federal resource agencies as a species of special concern.

2.1.7j: Stream: The channel, seep, pond, waterway, or are associated with the operation of water where the District shall perform routine maintenance projects, all of which are identified in Figure 2-3. "Stream" includes perennial, intermittent, ephemeral, and permanent bodies of flowing water within a natural streambed.

2.1.7k: Stream Channel: The portion of the stream through which water and sediment flow, have flowed, or are capable of flowing, delineated by the top of the bank or the outer edge of any riparian vegetation. Levee slopes, channel banks, channel bottoms, and other Stream Channel features are illustrated in Figure 2-4 and Figure 2-5.

2.1.7l: Type 1 Channel: Natural waterways as illustrated in Figure 2-4. Typical conditions within the channel cross-section consist of the absence of vegetation on the lower half and the potential presence of vegetation on the upper half.

2.1.7m: Type 2 Channel: Natural waterways as illustrated in Figure 2-5. Typical conditions within the channel cross-section consist of absence of vegetation.

2.1.7 SITE AND SURROUNDING LAND USES AND SETTINGS

The river/stream channel maintenance area occurs in the lower San Joaquin Valley within Tulare and Kings Counties. Lands surrounding the maintenance area are primarily agricultural lands which have been leveled and developed for irrigated row, vineyard, and orchard crops. Other lands consist of lands that have been urbanized by cities and towns. Small, narrow corridors of riparian vegetation exist along the banks of the river system. Vegetation consists mainly of native trees and brush in combination with large patches of invasive non-native weedy plants.

2.1.8 OTHER PUBLIC AGENCIES WHOSE APPROVAL MAY BE REQUIRED

- California Department of Fish and Wildlife – Section 1602 Programmatic Stream Maintenance Agreement
- State Water Resources Control Board – National Pollutant Discharge Elimination System (NPDES) Construction General Permit
- NPDES permits (Sections 401 and 404 of the Clean Water Act) from the California Environmental Protection Agency, United States Army Corps of Engineers (USACE), and Regional Water Quality Control Board (RWQCB)
- Nationwide Permit 3 and/or 13, as applicable, from the USACE
- Section 10 Permit the USACE as applicable, in accordance with Section 10 of the Rivers and Harbors Act
- Encroachment Permits, as applicable
- Lease or authorization from the California State Lands Commission, as applicable, for continued use of State land, in accordance with California Government Code Section 65940

2.1.9 CONSULTATION WITH CALIFORNIA NATIVE AMERICAN TRIBES

Public Resources Code Section 21080.3.1, *et seq. [codification of Assembly Bill (AB) 52, 2013-14]* 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 not received any written correspondence from a Tribe pursuant to Public Resources Code Section 21080.3.1 requesting notification of proposed project.

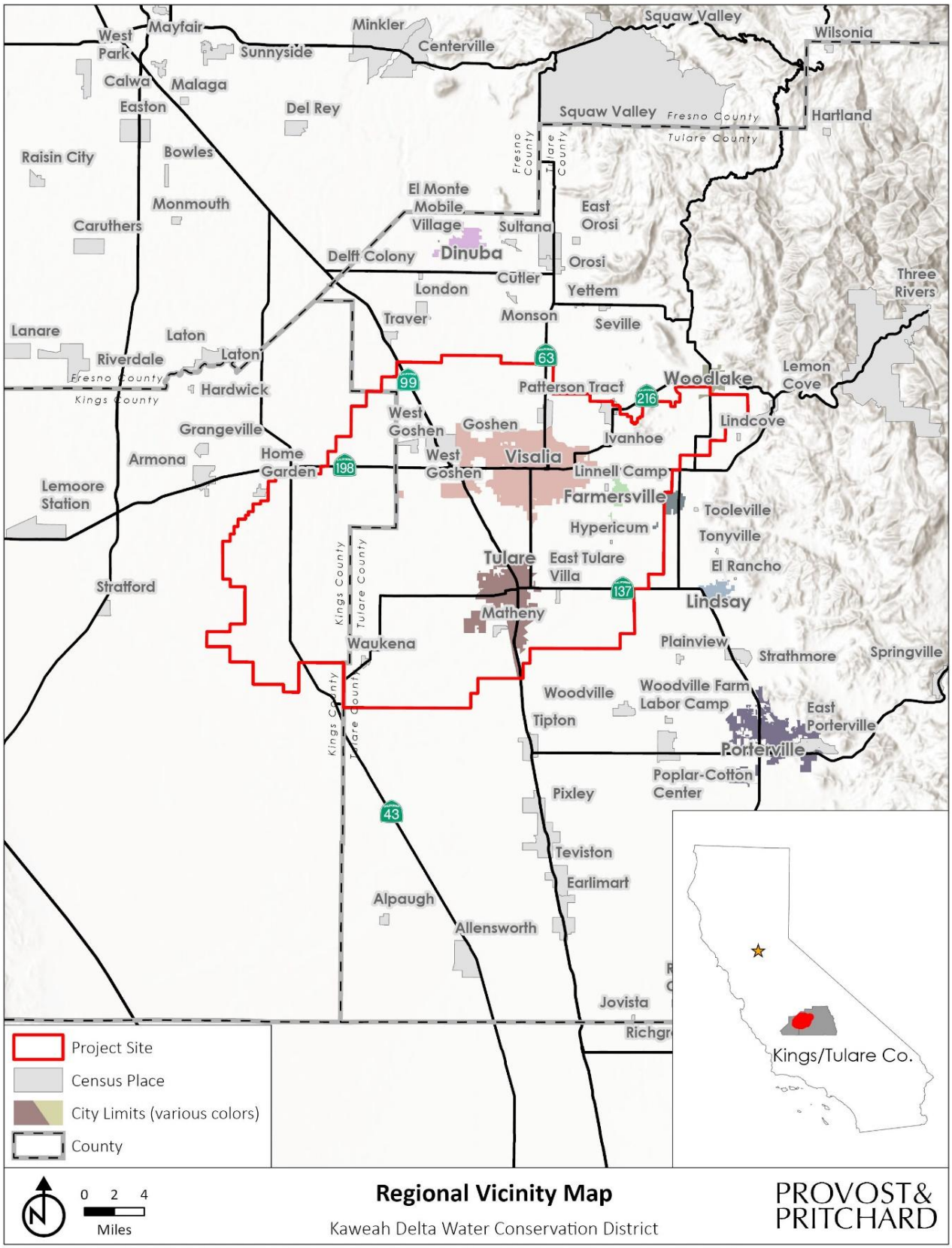

Figure 2-1: Regional Location Map

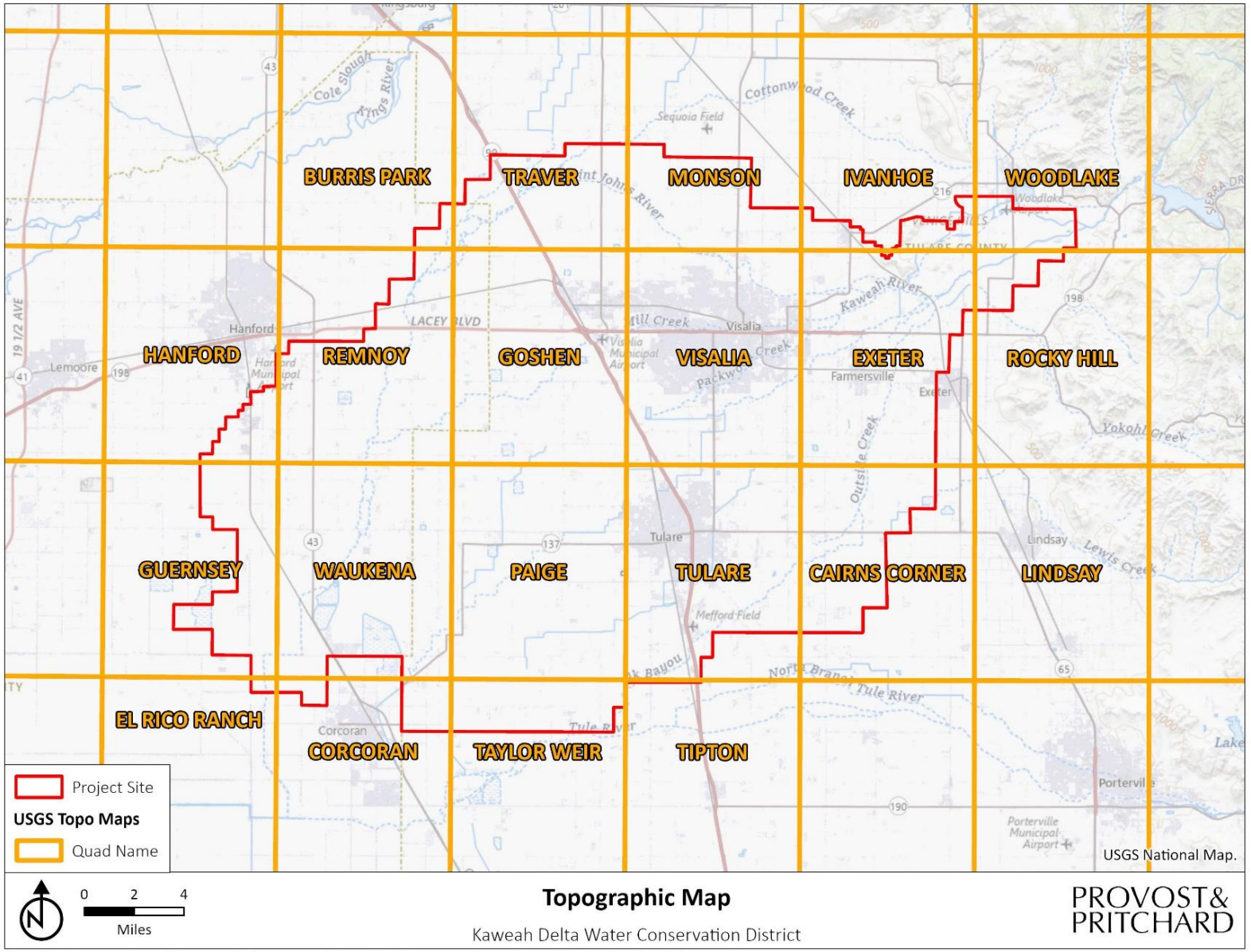

Figure 2-2: Topographical Quadrangle Map

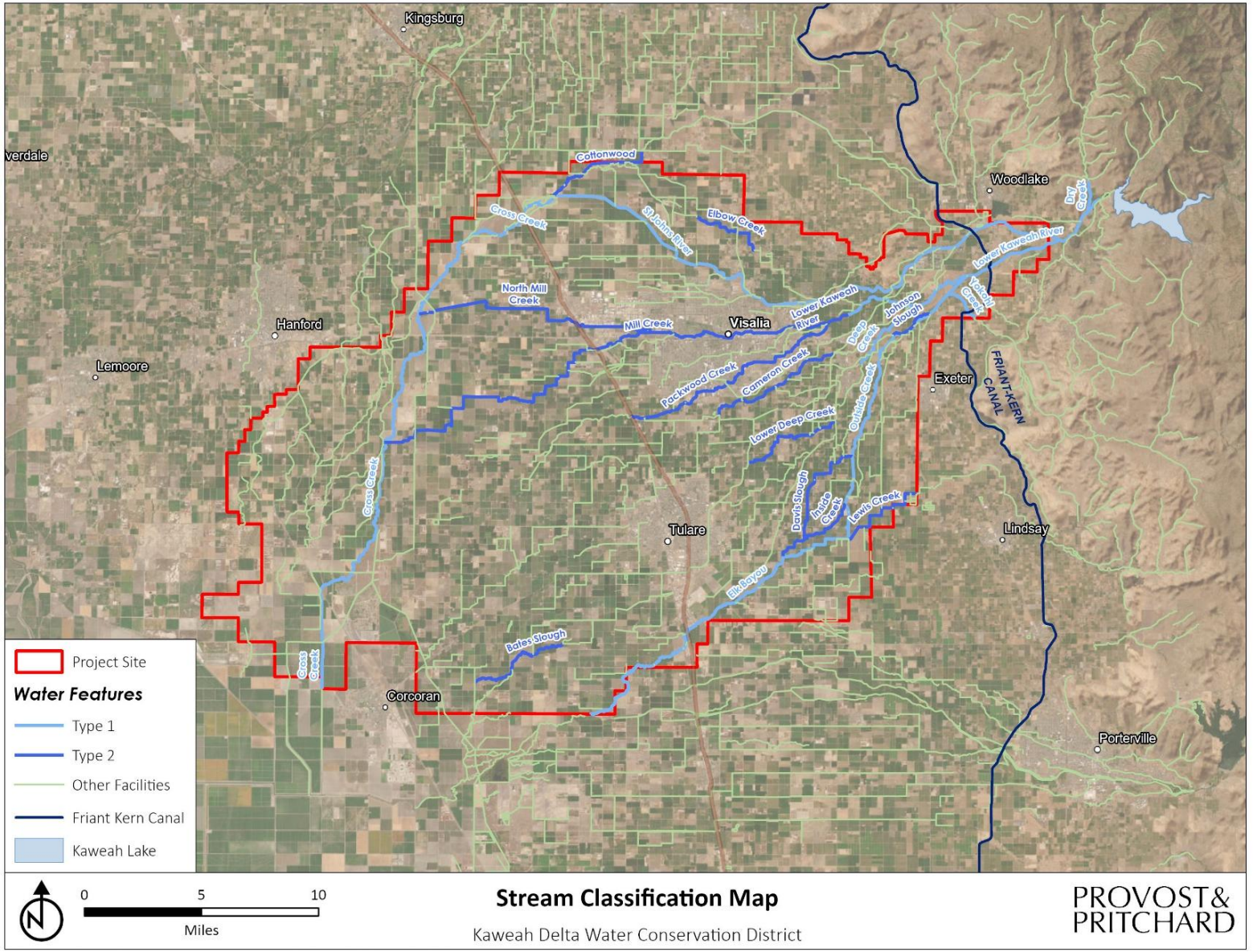

Figure 2-3: Kaweah Delta Water Conservation District Stream Classification Map

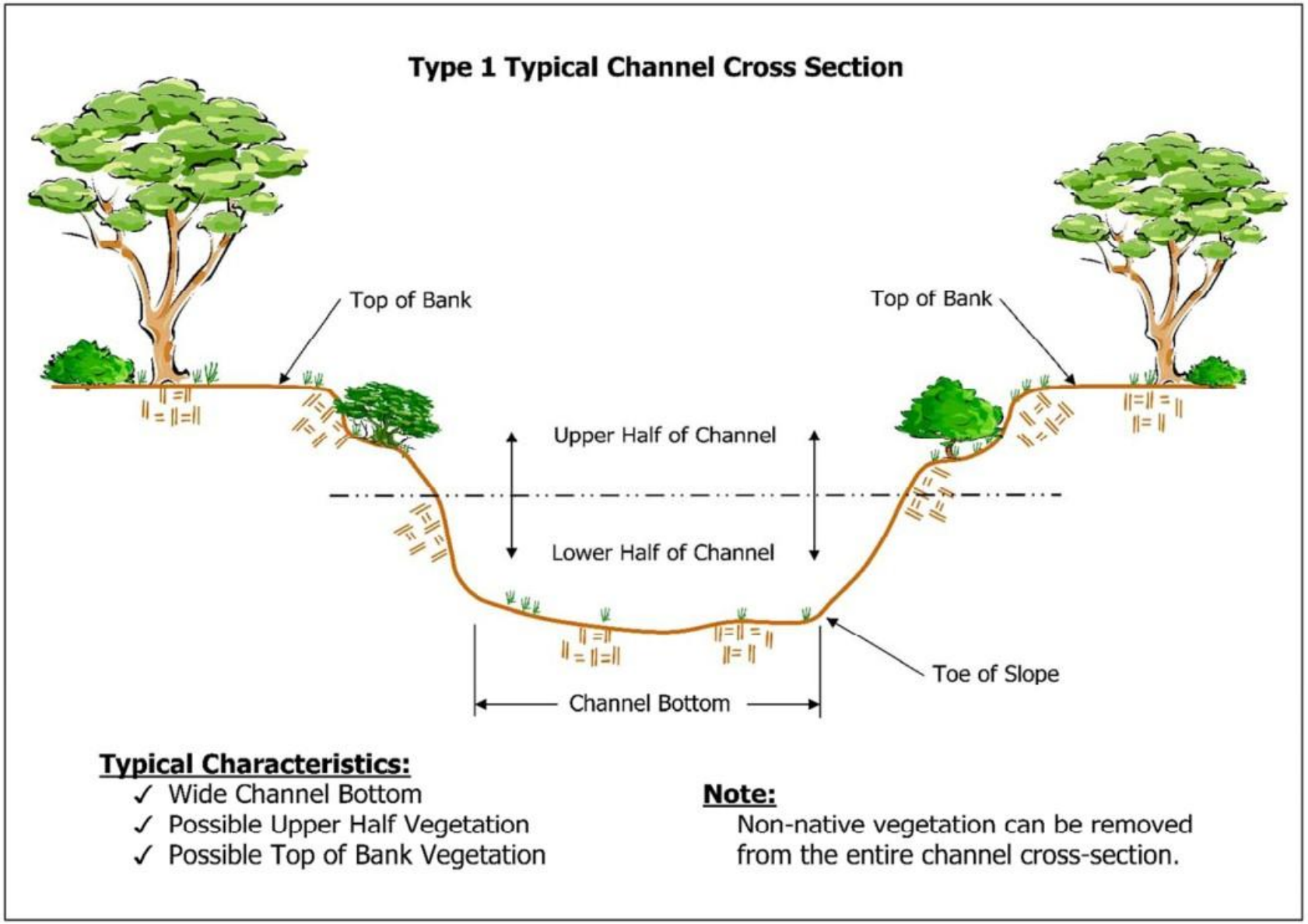

Figure 2-4: Type 1 Typical Channel Cross Section Map

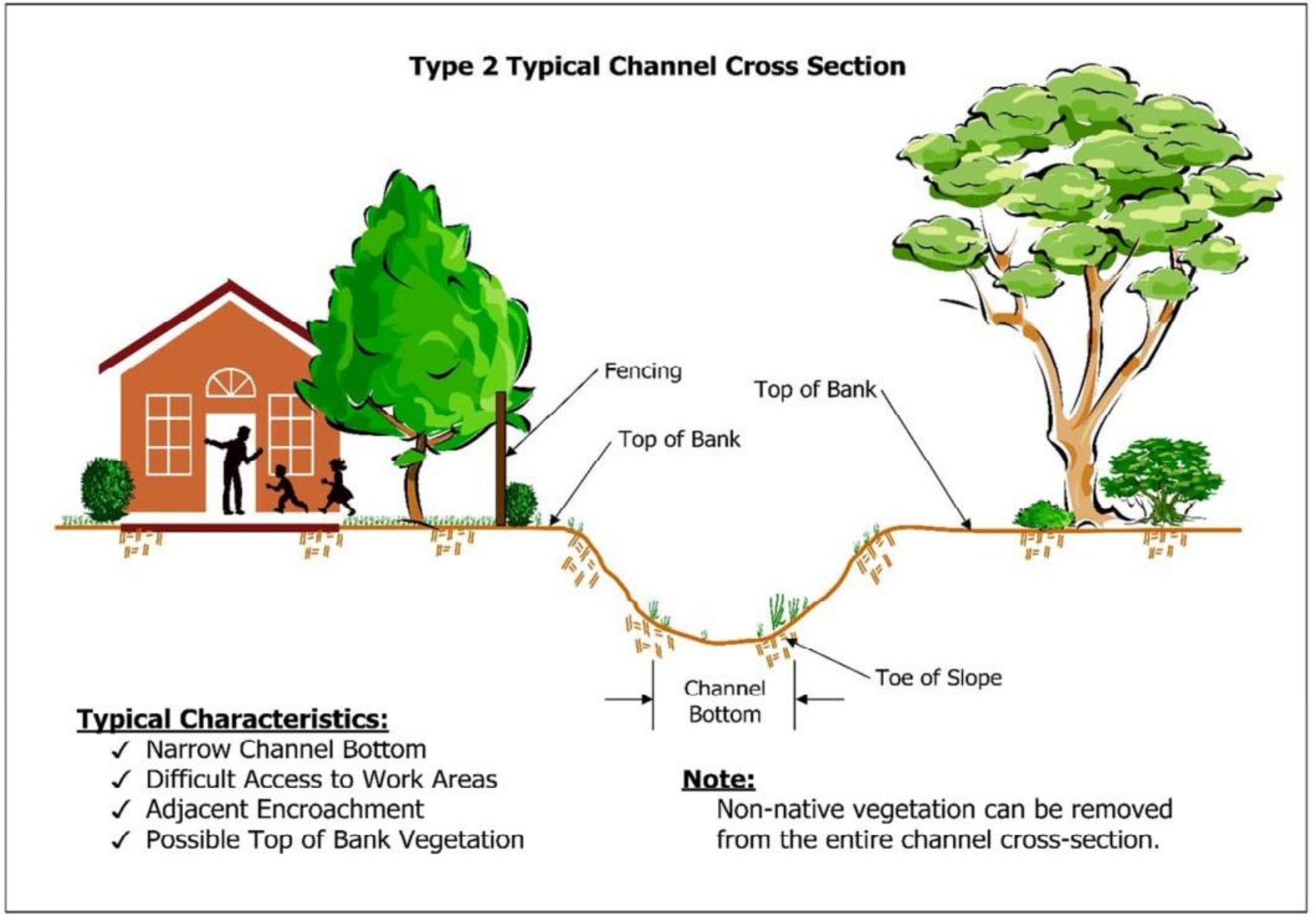

Figure 2-5: Type 2 Typical Channel Cross Section Map

CHAPTER 3 DETERMINATION

3.1 POTENTIAL ENVIRONMENTAL IMPACTS

As indicated by the discussions of existing and baseline conditions, and impact analyses that follow in this Chapter, environmental factors not checked below would have no impacts or less than significant impacts resulting from the project. Environmental factors that are. checked below would have potentially significant impacts resulting from the project. Mitigation measures are recommended for each of the potentially significant impacts that would reduce the impact to less than significant.

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

The analyses of environmental impacts in Chapter 4 Impact Analysis result in an impact statement, which shall have the following meanings.

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).

3.2 DETERMINATION

On the basis of this initial evaluation (to be completed by the Lead Agency):

☐ 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

03/19/2025
Date

LUIS VERDUGO / ENGINEER
Printed Name/Position

CHAPTER 4 ENVIRONMENTAL IMPACT ANALYSIS

4.1 AESTHETICS

Table 4-1: Aesthetics Impacts

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 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?	☐	☐	☐	☒

4.1.1 BASELINE CONDITIONS

The Project is located in the southwestern part of Tulare County in the central San Joaquin Valley. Lands in the area consist of relatively flat irrigated farmland and retired farmland. Agricultural practices in the vicinity consist of row crop, field crop, and orchard cultivation in the form of vineyards, citrus, and nut crops. There are no State Scenic Highways in Kings County.[1] In Tulare County, approximately 4.5 miles of State Route (SR) 180 have been officially identified by Caltrans as a "designated State Scenic Highway;" however, that segment is approximately 40 miles northeast of the Project area. Rural roadways, local water distribution canals, water retention basins, and other infrastructure typical of rural agricultural areas in the San Joaquin Valley in addition to dairies and are also in the vicinity.

4.1.2 IMPACT ANALYSIS

a) Have substantial adverse effect on a scenic vista?

No Impact. Scenic features in the area may include waterways, canals and even the vast expanse of agricultural uses. The Project area is not within the viewshed of any scenic vista and Project area does not stand out from its surroundings in any remarkable fashion. There would be no impact.

[1] (California Department of Transportation, 2023)

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

No Impact. An approximately 24-mile segment of SR 180 located in southeastern Fresno County and north-central Tulare County is designated as a State Scenic Highway. A 4.5-mile portion of that segment crosses into Tulare County and is the only Officially Designated State Scenic Highway in Tulare County. Project activities would occur approximately 40 miles southwest and do not have the potential to affect the highway. There are no scenic resources or scenic vistas located on or in the vicinity of the Project site. Therefore, there would be no impact.

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?

No Impact. The Project would allow for maintenance of existing streams and rivers for flood control purposes. The Project area contains the Kaweah River System and agriculture and rural infrastructure, and is zoned agriculture uses. The Project would not degrade the visual character of the area. There would be no impact.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

No Impact. The Project area contains primarily agriculture lands and other rural uses. No artificial lighting is proposed. Vehicular traffic to the site would be limited to maintenance trips by District staff. Therefore, the Project would 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. There would be no impact.

4.2 AGRICULTURE AND FORESTRY RESOURCES

Table 4-2: Agriculture and Forest Impacts

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?	☐	☐	☐	☒

4.2.1 BASELINE CONDITIONS

The Project is located in California's San Joaquin Valley in both Tulare County and Kings County. Tulare County's total gross production value for 2023 was $7.9 billion while Kings County was $2.2 billion. Tulare County's top five commodities consisted of milk, grapes, cattle and calves, oranges (navels and valencias), and pistachios. Kings County's top five commodities consisted of milk, pistachios, cotton, cattle and calves, and processed tomatoes.

As part of the Farmland Mapping and Monitoring Program (FMMP), the California Department of Conservation (DOC) applies the Natural Resources Conservation Service (NRCS) soil classifications to identify agricultural lands, and these agricultural designations are used in planning for the present and future of California's agricultural land resources. These designated agricultural lands are included in the Important Farmland Maps. The FMMP was established in 1982 to assess the location, quality, and quantity of agricultural lands and the conversion of these lands. The FMMP provides analysis of agricultural land use and land use changes throughout California. The DOC has a minimum mapping unit of 10 acres, with parcels that are smaller than 10 acres being absorbed into the surrounding classifications.

The list below provides a comprehensive description of all the categories mapped by the DOC.

- Prime Farmland. 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. 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.
- Unique Farmland. 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.
- Farmland of Local Importance. Land of importance to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee. In some counties, Confined Animal Agriculture facilities are part of Farmland of Local Importance, but they are shown separately.
- Grazing Land. Land on which the existing vegetation is suited to the grazing of livestock. This category was developed in cooperation with the California Cattlemen's Association, University of California Cooperative Extension, and other groups interested in the extent of grazing activities.
- Urban and Built-up Land. Land occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately 6 structures to a 10-acre parcel. This land is used for residential, industrial, commercial, construction, institutional, public administration, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes.
- Other Land. Land not included in any other mapping category. Common examples include low density rural developments; brush, timber, wetland, and riparian areas not suitable for livestock grazing; confined livestock, poultry or aquaculture facilities; strip mines, borrow pits; and water bodies smaller than forty acres. Vacant and non-agricultural land surrounded on all sides by urban development and greater than 40 acres is mapped as Other Land.
- Water. Perennial water bodies with an extent of at least 40 acres.

See Figure 4-1 for an overview illustration of the FMMP designations for the Project area.

4.2.2 IMPACT ANALYSIS

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?

No Impact. The Project area is designated all types of land as seen on Figure 4-1. The Project would allow for flood maintenance of rivers and streams within the District. The Project does not involve development or conversion of land. There would be no impact to farmland.

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

No Impact. The Project does not propose development or conversion of land. There would be no impact to zoning or Williamson Act.

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))?

No Impact. There are no forests or timberland in the region, and the site is not zoned to support forest land or timberland. The Project does not propose any rezoning or land conversion. There would be no impact.

d) Result in the loss of forest land or conversion of forest land to non-forest use?

No Impact. There are no forests within the District or the surrounding area; therefore, the Project would not result in the loss of or conversion of forest land to non-forest use. There would be no impact.

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

No Impact. There is no forest or timberland located on or near the Project area, nor is the site zoned for forest land or timberland. The Project involves routine river and stream maintenance activities and would not convert forest land to non-forest use. There would be no impact.

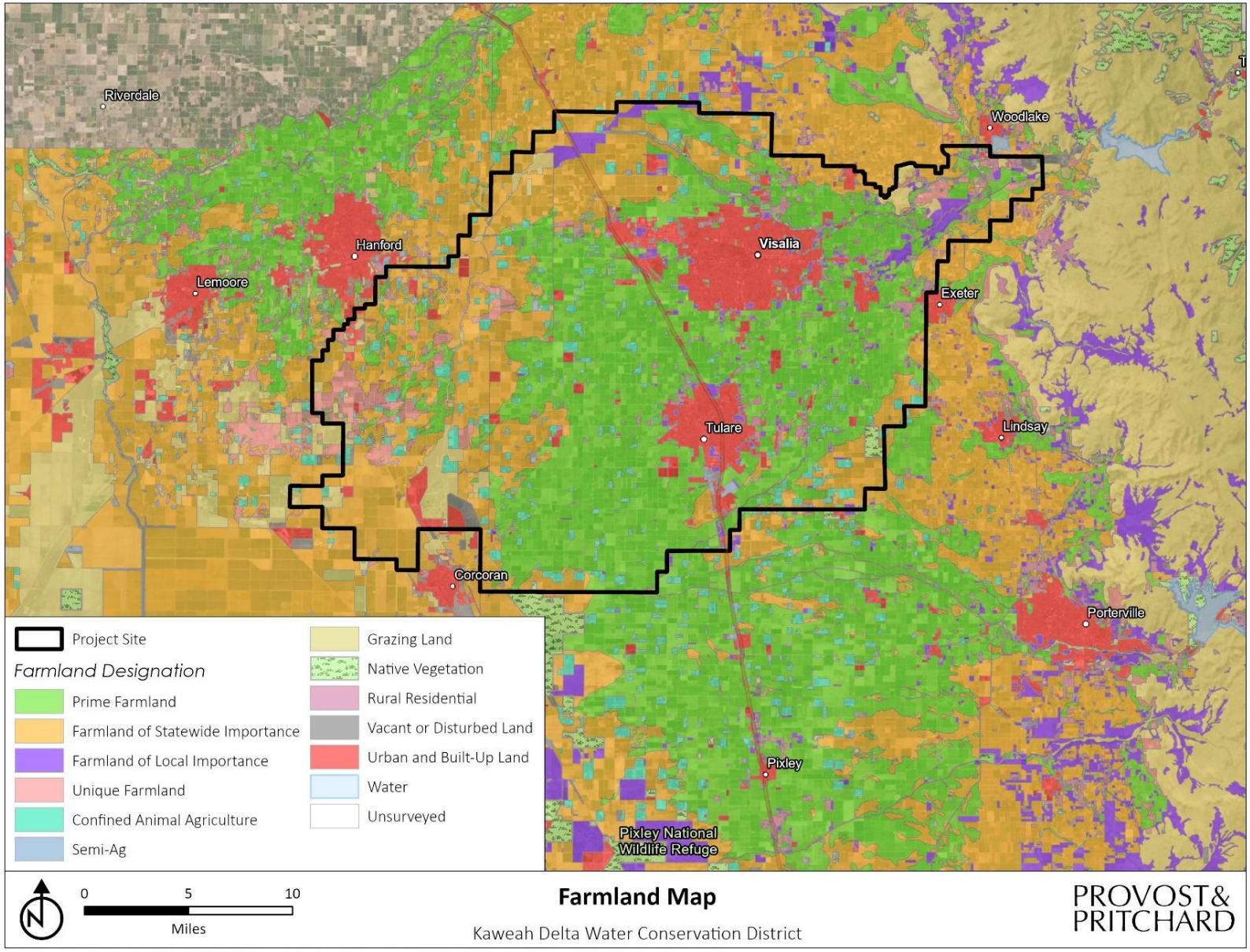

Figure 4-1: Farmland Designation Map

4.3 AIR QUALITY

Table 4-3: Air Quality Impacts

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?	☐	☐	☒	☐

4.3.1 BASELINE CONDITIONS

The Project is located in the County of Tulare, within the boundaries of the San Joaquin Valley Air Pollution Control District (SJVAPCD) and the San Joaquin Valley Air Basin (SJVAB). The SJVAB is positioned within the San Joaquin Valley of California. The San Joaquin Valley is bounded by the Sierra Nevada Mountain Range to the east and the Coastal Mountain Range to the west. Wind within the SJVAB typically channels south-southwest during the summer months, while wind flows to the north-northwest during the winter months. Wind velocity for the region is considered low for an area of such size.[2] Due to a lack of strong wind and the natural confinement of the mountain ranges surrounding the SJVAB, the region experiences some of the worst air quality in the world.

4.3.2 APPLICABLE REGULATIONS

Under the California Clean Air Act (CCAA), the California Air Resources Board (CARB) is required to designate areas of the State as attainment, nonattainment, or unclassified with respect to applicable standards. An "attainment" designation for an area signifies that pollutant concentrations did not violate the applicable standard in that area. A "nonattainment" designation indicates that a pollutant concentration violated the applicable standard at least once, excluding those occasions when a violation was caused by an exceptional event, as defined in the criteria. Depending on the frequency and severity of pollutants exceeding applicable standards, the nonattainment designation can be further classified as serious nonattainment, severe nonattainment, or extreme nonattainment, with extreme nonattainment being the most severe of the classifications. An "unclassified" designation signifies that the data does not support either an attainment or nonattainment designation. The CCAA divides districts into moderate, serious, and severe air pollution categories, with increasingly stringent control requirements mandated for each category. The United States Environmental Protection Agency (USEPA) designates areas for ozone (O_3), carbon monoxide (CO), and nitrogen dioxide (NO_2) as "does not meet the primary standards," "cannot be classified," or "better than national standards." For SO_2, areas are designated as "does not meet the primary standards," "does not meet the secondary standards," "cannot be classified," or "better than national standards." However, the CARB terminology of attainment, nonattainment, and unclassified is more frequently used.

[2] (San Joaquin Valley Air Pollution Control District, 2022)

The USEPA uses the same sub-categories for nonattainment status: serious, severe, and extreme. In 1991, USEPA assigned new nonattainment designations to areas that had previously been classified as Group I, II, or III for particulate matter 10 microns in size (PM_{10}) based on the likelihood that they would violate national PM_{10} standards. All other areas are designated as "unclassified."

The SJVAB is currently designated as a nonattainment area with respect to the State PM_{10} standard, ozone, and particulate matter 2.5 microns in size ($PM_{2.5}$) standards. The SJVAB is designated nonattainment for the National Ambient Air Quality Standard (NAAQS) eight-hour ozone and $PM_{2.5}$ standards. On September 25, 2008, the USEPA re-designated the San Joaquin Valley to attainment status for the PM_{10} NAAQS and approved the PM_{10} Maintenance Plan.[3]

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

Pollutant	Averaging Time	California Standards*		National Standards*	
		Concentration*	Attainment Status	Primary	Attainment Status
OZONE (O_3)	1-hour	0.09 parts per million (ppm)	Nonattainment/ Severe	–	No Federal Standard
	8-hour	0.070 ppm	Nonattainment	0.075 ppm	Nonattainment (Extreme)**
PARTICULATE MATTER (PM_{10})	AAM	20 micrograms per cubic meter ($\mu g/m^3$)	Nonattainment	–	Attainment
	24-hour	50 $\mu g/m^3$		150 $\mu g/m^3$	
FINE PARTICULATE MATTER ($PM_{2.5}$)	AAM	9 $\mu g/m^3$	Nonattainment	9 $\mu g/m^3$	Nonattainment
	24-hour	No Standard		35 $\mu g/m^3$	
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 parts per billion (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 $\mu g/m^3$	Attainment	–	No Designation/ Classification
	Calendar Quarter	–		--	
	Rolling 3-Month Average	–		0.15 $\mu g/m^3$	
SULFATES (SO_4)	24-hour	25 $\mu g/m^3$	Attainment	No Federal Standards	
HYDROGEN SULFIDE (H_2S)	1-hour	0.03 ppm (42 $\mu g/m^3$)	Unclassified		
VINYL CHLORIDE (C_2H_3CL)	24-hour	0.01 ppm (26 $\mu g/m^3$)	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		

[3] (San Joaquin Valley Air Pollution Control District, 2022)

** For more information on standards visit: https://ww3.arb.ca.gov/research/aaqs/aaqs2.pdf*
*** No Federal 1-hour standard. Reclassified extreme nonattainment for the Federal 8-hour standard [January 27, 2025].*
****Secondary Standard*
Source: http://www.valleyair.org/aqinfo/attainment.htm. Accessed January 2025

4.3.3 IMPACT ANALYSIS

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

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?

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

Less than Significant Impact. The District has been performing maintenance activities within the Kaweah River system for over 50 years. The Project does not propose an increase in trips or maintenance activities from current baseline conditions. The District routinely complies with applicable SJVAPCD rules and regulations designed to reduce air quality impacts.

Maintenance activities require the use of vehicles for purposes of transporting personnel and equipment to work sites. Project-related activities include use of fuel-powered equipment such as chainsaws, mowers, excavators, skidsteers, and loaders. Short-term vehicle and equipment emissions would be generated during maintenance activities; however, they would be minor and only utilized on an as-needed basis. As a standard practice, equipment is properly tuned and muffled, and unnecessary idling is minimized to reduce potential impacts to air quality.

The Project lies within the SJVAB, which is managed by the SJVAPCD. 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. As illustrated in Table 4-4, the San Joaquin Valley is designated as a State and Federal nonattainment area for O_3, a State and Federal nonattainment area for $PM_{2.5}$, and a State nonattainment area for PM_{10}.

Project-related maintenance activities may result in the temporary generation of emissions associated with site grading and excavation, motor vehicle exhaust associated with construction equipment and worker trips, as well as the movement of construction equipment on unpaved surfaces. 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 potential 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.

The nature of the Project is long-term routine maintenance of the Kaweah River system. The River/Stream Maintenance Project proposes to continue performing maintenance on existing channels and facilities. No new construction activities are proposed, and there is no proposed change in frequency of maintenance activities. Project-related activities producing pollutant emissions would be sporadic, short in duration, and spatially distributed throughout the District's boundaries within Tulare and Kings counties. Even when considered cumulatively, the Project is not expected to contribute significantly to the output of criteria air pollutants. Furthermore, conducting maintenance on existing flood control facilities and channels within the Kaweah River system should be considered existing baseline conditions. For all of the aforementioned reasons, it can be concluded that no change in existing emissions would occur. Therefore, any impacts to air quality would be less than significant.

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

Less than Significant Impact. The River/Stream Maintenance Project does not involve wastewater treatment or other processes that may be associated with objectionable odors. However, maintenance activities may 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. However, the Project is located within an area dominated by agricultural production, which includes the use of diesel-powered equipment and various odorous chemicals on a regular basis. Furthermore, as stated above in Impact Analysis "a"-"c", no new activities are proposed. Conditions created by Project-related construction activities would not vary from the existing baseline conditions. Any impact would be less than significant.

4.4 BIOLOGICAL RESOURCES

Table 4-5: Biological Resources Impacts

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 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?	☐	☒	☐	☐
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?	☐	☐	☐	☒

4.4.1 BASELINE CONDITIONS

4.4.1.1 GENERAL

The Project is located in the south-central portion of the San Joaquin Valley within portions of both Tulare and Kings Counties. The total area of the District is about 340,000 acres with approximately 255,000 acres located in the western portion of Tulare County and 85,000 acres, in the northeastern portion of the Kings County. The Project area encompasses approximately 209 miles of rivers, streams, creeks, and sloughs that are tributaries or distributaries to the Kaweah River within Tulare and Kings Counties. The site is limited to these waters and includes the bed and banks of each of these waterways with the outer limits between the top of bank or edge of riparian vegetation, whichever is greater.

4.4.1.2 TOPOGRAPHY

The District's boundaries and Project site are located within the *Burris Park, Cairns Corner, Corcoran, El Rico Ranch, Exeter, Goshen, Guernsey, Hanford, Ivanhoe, Monson, Paige, Remnoy, Rocky Hill, Taylor Weir, Tipton, Traver, Tulare, Visalia, Waukena, and Woodlake,* U.S. Geological Survey (USGS) 7.5-minute quadrangles. The topography within the District's boundaries is relatively flat within the valley with small hills in the foothills leading to mountains on the east side of the site. Elevations within the District's boundaries range from approximately 160 to 1,680 feet above mean sea level.

4.4.1.3 CLIMATE

Like most of California, the site experiences a Mediterranean climate. Warm, dry summers are followed by cool, moist winters. In the summer, average high temperatures range between 85- and 95-degrees Fahrenheit (°F), but often exceed 90 °F, and the humidity is generally low. Winter temperatures are often below 60 °F during the day and rarely exceed 70 °F. On average, the City of Visalia receives approximately 12 inches of precipitation in the form of rain yearly, most of which occurs between October and March (WeatherSpark, 2024), and a majority of the site would be expected to receive similar amounts of precipitation, with higher amounts expected in the foothills.

4.4.1.4 HYDROLOGY

Numerous public and private entities within the District's boundaries divert water from the Kaweah River and its distributaries through 21 different waterways (see Table 2-1). Nearly all of the lands served with Kaweah River water are also served irrigation water from groundwater, primarily due to the erratic and relatively undependable nature of flow on the Kaweah River. All municipal and industrial water uses within the District are supplied from groundwater.

4.4.1.5 SOILS

Sixty-two soil mapping units representing forty-six soil types were identified within the District's boundaries (see Appendix D of Appendix A).

4.4.1.6 BIOTIC HABITATS

While the District's lands contain various habitats, the Project's maintenance activities would only occur within the waterways which are composed of riverine habitat. This habitat and its constituent plant and animal species are described in more detail in the following section.

4.4.1.7 RIVERINE

The channels of the Kaweah River system represent riverine habitat, including rivers, streams, creeks, and sloughs. The majority of the Kaweah River system receives water flows during releases from Terminus Dam for irrigation or flood control. The river system water sources originate from both regulated and unregulated watersheds, such that three different flow conditions can occur. The first and most common being regulated flows, the second being the combination of regulated and unregulated flows and the last and least occurring being only unregulated flows. Channels are commonly dry throughout late summer through spring. Of the channels surveyed in October 2024, the majority were dry. Riverine habitat often occurs in association with a variety of terrestrial vegetation, such as riparian vegetation, which often abuts rivers and streams. Riparian vegetation is located within some of the Project site areas and is included with riverine habitat. Riverine habitat provides food, shelter, and spawning and rearing habitat for a variety of native fish and introduced warmwater game fish species. Within the Kaweah River system, common native fish species include Sacramento sucker (*Catostomus occidentalis*) and Sacramento pikeminnow (*Ptychocheilus grandis*); frequently observed non-native species include common carp (*Cyprinus carpio*), mosquitofish (*Gambusia affinis*), largemouth bass (*Micropterus salmoides*), white catfish (*Ameiurus catus*), and bluegill (*Lepomismacrochirus*). Riverine and adjacent riparian vegetation provides suitable nesting habitat for waterfowl, migratory birds, and shorebirds. Waterfowl tracks were observed within the channels, which suggests that avian species use the channels for feeding, year-round. In addition to avian

sign, the following mammal tracks were observed: coyote (*Canis latrans*), opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), and striped skunk (*Mephitis mephitis*). Along the banks of the Kaweah River system, the following species were observed: western fence lizard (*Sceloporus occidentalis*) and California ground squirrel (*Otospermophilus beecheyi*).

4.4.1.8 NATURAL COMMUNITIES OF SPECIAL CONCERN AND RIPARIAN HABITAT

Natural communities of special concern are those that are of limited distribution, distinguished by significant biological diversity, or home to special status species. CDFW has classified and mapped all natural communities in California. Just as the special status plant and animal species, these natural communities of special concern can be found within the California Natural Diversity Database (CNDDB). According to the CNDDB, there are five recorded observations of natural communities of special concern with potential to occur within the District's boundaries or vicinity: Great Valley Valley Oak Riparian Forest, Northern Claypan Vernal Pool, Northern Hardpan Vernal Pool, Sycamore Alluvial Woodland, and Valley Sacaton Grassland. Only one of these communities would be expected to occur within the Project site. Great Valley Valley Oak Riparian Woodland could occur within the Project site as it is present within the boundaries of Kaweah Oaks Preserve in Tulare County.

Riparian habitat is composed of plant communities that occur along the banks, and sometimes over the banks, of most waterways and is an important habitat for numerous wildlife species. CDFW has jurisdiction over most riparian habitat in California. Riparian vegetation was observed within the Project site, and it would be expected to be present in other portions of the Project site.

4.4.1.9 DESIGNATED CRITICAL HABITAT

The United States Fish and Wildlife Service (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, which may require special management and protection. According to the USFWS Information for Planning and Consultation (iPaC) system, designated critical habitat for California tiger salamander, Hoover's spurge, San Joaquin Valley Orcutt grass, vernal pool fairy shrimp, and vernal pool tadpole shrimp occurs near the District's northern boundary near Cottonwood Creek and Cross Creek, however the Project site would not be expected to have any of the Primary Constituent Elements required by these critical habitats.

4.4.1.10 WILDLIFE MOVEMENT CORRIDORS AND NATIVE WILDLIFE NURSERY SITES

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 water features and drainages of the site could provide potential wildlife movement corridors for a variety of wildlife. The Project site is located in a fragmented region often disturbed by intensive agricultural cultivation practices and these water features could be used as corridors through this region.

Native wildlife nursery sites are areas where a species or group of similar species raise their young in a concentrated place, such as maternity bat roosts. Areas where maternity bat roosts could occur, such as bridges or buildings, were located within the Project.

4.4.1.11 SPECIAL STATUS PLANT AND ANIMALS

A query of the CNDDB for occurrences of special status plant and animal species was conducted for the *Burris Park, Cairns Corner, Corcoran, El Rico Ranch, Exeter, Goshen, Guernsey, Hanford, Ivanhoe, Monson, Paige, Remnoy, Rocky Hill, Taylor Weir, Tipton, Traver, Tulare, Visalia, Waukena, and Woodlake,* USGS 7.5-minute quadrangles that contain the site. A query of the IPaC was also completed for the site. These species, and their potential to occur within the site, are listed in Table 4-6 and Table 4-7, below. Other special status species that did not show up in the CNDDB query, but have the potential to occur in the vicinity, are also

included in Table 4-7. Species lists obtained from CNDDB and IPaC are available in Appendix B and Appendix C of Appendix A, respectively. All relevant sources of information, as discussed in the Study Methodology section of this report, as well as field observations.

Table 4-6: List of Special Status Plants with Potential to Occur on the Site and/or in the Vicinity

Species	Status*	Habitat	Occurrence within the Site
Alkali-sink goldfields (*Lasthenia chrysantha*)	California Native Plant Society (CNPS) 1B	Found in vernal pool and wet saline flat habitats in the San Joaquin Valley region at elevations below 700 feet. Blooms February – April.	**Unlikely.** While suitable habitats for this species occur within the District's boundaries, they do not occur within the project site.
Brittlescale (*Atriplex depressa*)	CNPS 1B	Found in the Central Valley in alkaline or clay soils, typically in meadow or annual grassland habitats at elevations below 1,100 feet. Sometimes associated with vernal pools. Blooms June – October.	**Unlikely.** While suitable habitats for this species occur within the District's boundaries, they do not occur within the project site.
Calico monkeyflower (*Diplacus pictus*)	CNPS 1B	Found in the Sierra Nevada foothills and the Tehachapi mountains in bare, sunny, shrubby areas, around granite outcrops within foothill woodland communities at elevations between 450 and 4,100 feet. Blooms March – May.	**Absent.** Habitats required by this species were absent within the project site.
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 3,000 feet. Blooms March – May.	**Unlikely.** While suitable habitats for this species occur within the District's boundaries, they do not occur within the project site.
California jewelflower (*Caulanthus californicus*)	FE, CE, CNPS 1B	Found in the San Joaquin Valley and western Transverse Ranges in sandy soils. Occurs on flats and slopes, generally in non-alkaline grassland at elevations between 200 and 6,100 feet. Blooms February – April.	**Absent.** All known populations of this plant within Tulare and Kings Counties have been extirpated.
California satintail (*Imperata brevifolia*)	CNPS 2B	Often found in wet springs, meadows, streambanks, and floodplains, and can also be found in coastal scrub, riparian scrub, Mojavean desert scrub, chaparral, and alkali seeps at elevations below 1,600 feet. Blooms September – May.	**Unlikely.** While suitable habitats for this species occur within the District's boundaries, they do not occur within the project site.
Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*)	CNPS 1B	Found on alkaline and saline soils in vernal pool and playas in grassland habitats at elevations below 4,500 feet. Blooms April – May.	**Unlikely.** While suitable habitats for this species occur within the District's boundaries, they do not occur within the project site.
Earlimart orache (*Atriplex cordulata* var. *erecticaulis*)	CNPS 1B	Found in the San Joaquin Valley in saline and alkaline soils, typically within valley grasslands at elevations below 400 feet. Blooms August – September.	**Unlikely.** While suitable habitat occurs within the District's boundaries, this habitat does not occur within the project site.
Greene's tuctoria (*Tuctoria greenei*)	FE, CNPS 1B	Found in the San Joaquin Valley and other parts of California in vernal pools within valley grassland, wetland, and riparian communities	**Unlikely.** While suitable habitats for this species occur within the District's boundaries, they do not occur within the project site.

Species	Status*	Habitat	Occurrence within the Site
		at elevations below 3,500 feet. Blooms May – September.	
Heartscale (*Atriplex cordulata* var. *cordulata*)	CNPS 1B	Found in the Central Valley in saline or alkaline soils within shadscale scrub, valley grassland, and wetland-riparian communities at elevations below 250 feet. Blooms June – July.	**Unlikely.** While suitable habitats for this species occur within the District's boundaries, they do not occur within the project site.
Hoover's spurge (*Euphorbia hooveri*)	FT, CNPS 1B	Found in vernal pools within valley grassland, freshwater wetland, and riparian communities at elevations below 800 feet. Blooms July – September.	**Unlikely.** While suitable habitats for this species occur within the District's boundaries, they do not occur within the project site.
Kaweah brodiaea (*Brodiaea insignis*)	CE, CNPS 1B	Found in the Sierra Nevada foothills in foothill woodland and valley grassland communities at elevations between 650 and 1,700 feet. Blooms May – June.	**Absent.** The project site is outside of the elevational range for this species and habitats required by this species were absent from the project site.
Lesser saltscale (*Atriplex minuscula*)	CNPS 1B	Found in the San Joaquin Valley in sandy, alkaline soils in alkali scrub, valley and foothill grassland, and alkali sink communities at elevations below 750 feet. Blooms April – October.	**Unlikely.** While suitable habitats for this species occur within the District's boundaries, they do not occur within the project site.
Mud nama (*Nama stenocarpa*)	CNPS 2B	Found in the San Joaquin Valley as well as coastal and inland southern California. This facultative wetland species grows in marshy habitats including lake shores and riverbanks below 2,660 feet. Blooms March – October.	**Unlikely**. While the Kaweah River System potentially provides suitable habitat for this species, most of these waterways have been channelized and do not contain water year-round. There has only been one recorded observation of this species in 1999 near the District's southwestern boundary.
Recurved larkspur (*Delphinium recurvatum*)	CNPS 1B	Occurs in chenopod scrub, cismontane woodland, and grassland habitats on poorly drained, fine, alkaline soils; often in valley saltbush or valley chenopod scrub communities at elevations between 100 and 2,600 feet. Blooms March – June.	**Unlikely.** While suitable habitats for this species occur within the District's boundaries, they do not occur within the project site.
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 soils in valley and foothill grassland and cismontane woodland communities at elevations between 300 and 3,000 feet. Blooms March – May.	**Unlikely.** While suitable habitats for this species occur within the District's boundaries, they do not occur within the project site.
San Joaquin Valley Orcutt grass (*Orcuttia inaequalis*)	FT, CE, CNPS 1B	Found in the eastern San Joaquin Valley and the Sierra Nevada foothills in vernal pools within valley grassland, freshwater wetland, and wetland-riparian communities at elevations below 2,600 feet. Blooms April – September.	**Unlikely.** While suitable habitats for this species occur within the District's boundaries, they do not occur within the project site.
Sanford's arrowhead (*Sagittaria sanfordii*)	CNPS 1B	This species is an aquatic plant and is found in the San Joaquin Valley and other parts of California in freshwater marshes, ponds, canals, and ditches at elevations below 1,000 feet. Blooms May – October.	**Possible.** Some of the ponds and ditches within the District's boundaries potentially provide suitable habitat for this species.

Species	Status*	Habitat	Occurrence within the Site
Spiny-sepaled button-celery (*Eryngium spinosepalum*)	CNPS 1B	Found in the Sierra Nevada foothills and the San Joaquin Valley in vernal pools, swales, and roadside ditches. Often associated with clay soils in vernal pools within grassland communities. Occurs at elevations between 50 and 4,200 feet. Blooms April – July.	**Unlikely.** While suitable habitats for this species occur within the District's boundaries, they do not occur within the project site.
Striped adobe-lily (*Fritillaria striata*)	CT, CNPS 1B	Found in the Sierra Nevada foothills in adobe soil within valley grassland and foothill woodland communities at elevations below 3,300 feet. Blooms February – April.	**Absent.** Habitats required by this species were absent from the project site.
Subtle orache (*Atriplex subtilis*)	CNPS 1B	Found in the San Joaquin Valley in saline depressions in alkaline soils within valley and foothill grassland communities at elevations below 300 feet. Blooms June – October.	**Unlikely.** While suitable habitats for this species occur within the District's boundaries, they do not occur within the project site.
Vernal pool smallscale (*Atriplex persistens*)	CNPS 1B	Occurs in the Central Valley in alkaline vernal pools at elevations below 400 feet. Blooms June – September.	**Unlikely.** While suitable habitat occurs within the District's boundaries, this habitat does not occur within the project site.
Winter's sunflower (*Helianthus winteri*)	CNPS 1B	Found in the Sierra Nevada foothills on steep, south-facing grassy slopes, rock outcrops, and road-cuts at elevations ranging from 600 to 1,500 feet. Blooms year-round.	**Absent.** The site is below the elevational range for this species and habitats required by this species were absent from the project site.

Table 4-7: List of Special Status Animals with Potential to Occur on the Site and/or in the Vicinity

Species	Status*	Habitat	Occurrence within the Site
American badger (*Taxidea taxus*)	CSSC	Prefers drier open stages of shrub, forest, and herbaceous habitats with friable soils to burrow, but can be found within numerous habitats throughout California, including the margins of agricultural lands. Needs a sufficient prey base of burrowing rodents.	**Unlikely.** While suitable habitats occur within the District's boundaries, this species would not occur within the project site.
Blunt-nosed leopard lizard (*Gambelia sila*)	FE, CE, CFP	Occurs in the San Joaquin Valley region in expansive, arid areas with scattered vegetation. Today they inhabit non-native grassland and alkali sink scrub communities of the valley floor marked by poorly drained, alkaline, and saline soils. They can be found at elevations ranging from approx. 100 to 2,600 feet. They are absent from areas with steep slopes and dense vegetation, and areas subject to seasonal flooding. Adults may excavate shallow burrows but rely on deeper pre-existing rodent burrows for hibernation and reproduction.	**Unlikely.** There is only one recorded observation of this species within the District boundaries, and the observation was reported in 1974. In addition, suitable habitats for this species were absent from the project site.
Buena Vista Lake ornate shrew	FE, CSSC	Prefers moist soils, inhabiting marshes, swamps, and riparian shrublands in the Tulare Basin. Uses	**Unlikely.** While suitable habitat potentially occurs within the District's boundaries, there are no species observations in the District, and it is

Species	Status*	Habitat	Occurrence within the Site
(*Sorex ornatus relictus*)		stumps, logs, and leaf litter for cover.	unlikely this species would occur within the site.
Burrowing owl (*Athene cunicularia*)	CSSC	Resides in open, dry grasslands, deserts, scrublands, and other areas with low growing vegetation. Nests and roosts underground in existing burrows created by mammals, most often by ground squirrels, and human-made structures.	**Possible.** The banks along the waterways are suitable for burrowing owl.
California condor (*Gymnogyps californianus*)	FE, CE, CFP	Typically nests in cavities in canyon or cliff faces but has also been recorded nesting in giant sequoias in Tulare County. Requires vast expanses of open savannah, grassland, and/or foothill chaparral in mountain ranges of moderate altitude. Forages for carrion up to 100 miles from their roost/nest sites.	**Unlikely.** The site lacked suitable nesting habitat. While this species may fly over the site or forage within the site, it would not be expected to nest within the site. There are no recorded observations of this species on CNDDB within the regional vicinity of the project.
California tiger salamander – central California DPS (*Ambystoma californiense*)	FT, CT	Requires vernal pools or seasonal ponds for breeding and small mammal burrows for aestivation. Generally found in grassland and oak savannah plant communities in central California from sea level to 1,500 feet in elevation. Can migrate up to 1.3 miles to breed.	**Unlikely.** While suitable habitats occur within the District's boundaries, they are absent from the project site.
Conservancy fairy shrimp (*Branchinecta conservatio*)	FE	Found in large, turbid freshwater vernal pools in the Central Valley, from Tehama County in the north to Merced County in the south, with one outlying population in Ventura County's Interior Coast Ranges.	**Unlikely.** Suitable vernal pool habitat exists for this species within the District's boundaries, but this species has never been documented in the region and the nearest known population is over 70 miles away.
Crotch's bumble bee (*Bombus crotchii*)	CCE	Occurs throughout coastal California, as well as east to the Sierra Nevada-Cascade crest, and south into Mexico. Food plant genera include snapdragons, scorpionweeds, primroses, poppies, and buckwheats. Nests are often located underground in abandoned rodent nests, or above ground in tufts of grass, old bird nests, rock piles, or cavities in dead trees. This species overwinters under leaf litter or soft soil.	**Possible.** Riparian and other vegetation and portions of the project site likely provide suitable foraging and nesting habitats for this species.
Foothill yellow-legged frog – south Sierra Distinct Population Segment (*Rana boylii*)	FC, CE	Frequents rocky streams and rivers with rocky substrate and open, sunny banks in forests, chaparral, and woodlands. Occasionally found in isolated pools, vegetated backwaters, and deep, shaded, spring-fed pools.	**Unlikely.** Habitats of the project site were marginal for this species. Most of the project site is near or below the lower elevational range for this species. The only occurrence within the District's boundaries is from over 80 years old and is listed as extirpated.
Fisher- Southern Sierra Nevada-ESU (*Pekania pannanti*)	FE, CT	Can be found in intermediate to large-tree stages of coniferous forests with high percent canopy closure, generally within the low-	**Absent.** Suitable habitats for this species were absent within the District's boundaries and project site.

Species	Status*	Habitat	Occurrence within the Site
		medium elevational areas of the southern Sierra Nevada.	
Fresno kangaroo rat (*Dipodomys nitratoides exilis*)	FE, CE	An inhabitant of alkali sinks and open grassland habitats in Merced, Kings, Fresno, and Madera counties. Prefers bare, alkaline, clay-based soils subject to seasonal inundation with more friable soil mounds around shrubs and grasses. The most recent recorded observation of this species in California was in 1992 in Fresno County.	**Unlikely.** The annual grassland and alkali desert scrub habitat within the District may provide suitable habitat for this species, however this species has not been observed in California in over 30 years and suitable habitats for this species were absent from the project site.
Giant kangaroo rat (*Dipodomys ingens*)	FE, CE	Inhabits annual grassland communities with few or no shrubs and well-drained, sandy-loam soils on gentle slopes on the western side of the San Joaquin Valley.	**Unlikely.** The annual grassland and alkali desert scrub habitat within the District provided suitable habitat for this species, however these habitats were absent from the project site.
Loggerhead shrike (*Lanius ludovicianus*)	CSSC	Frequents open habitats with sparse shrubs and trees, other suitable perches, bare ground, and low herbaceous cover. In the Central Valley, this species nests in riparian areas, desert scrub, and agricultural hedgerows.	**Possible.** Suitable breeding and foraging habitats were present in the form of riparian trees and shrubs within the site and fallow fields, grazed grasslands, and agricultural crops in the surrounding areas.
Monarch butterfly (*Danaus plexippus*)	FC	Roosts in wind-protected tree groves (eucalyptus, Monterey pine, cypress), with nectar and water sources nearby. Larval host plants consist of milkweeds. Winter roost sites extend along the Pacific Coast from northern Mendocino to Baja California, Mexico.	**Possible.** The site contained suitable foraging habitat and this species could travel through the site during the breeding season. While it could travel through the site, roosting habitat was absent.
Mountain plover - nesting (*Charadrius montanus*)	CSSC	Breeds on open plains at moderate elevations outside of California. Winters in short-grass plains and fields, plowed or fallow fields, and sandy deserts within California. Prefers flat, bare ground with burrowing rodents.	**Unlikely.** Although, this species is known to winter in parts of California, habitats of the project site are marginal for this species and it would not be expected to nest within the site.
Northern California legless lizard (*Anniella pulchra*)	CSSC	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.	**Unlikely.** While suitable habitat occurs within the District's boundaries, this species would not occur within the project site.
Northern leopard frog (*Lithobates pipiens*)	CSSC	Inhabits grassland, wet meadows, potholes, forests, woodland, brushlands, springs, canals, bogs, marshes, and reservoirs in scattered locations in California. Generally, prefers permanent water with abundant riparian vegetation.	**Absent.** The site is not located within the historic range of any native or introduced populations and there have been no recorded observations of this species within the District boundaries and project site.
Northwestern pond turtle (*Actinemys marmorata*)	FPT, CSSC	An aquatic turtle of ponds, marshes, slow-moving rivers, streams, and irrigation ditches with riparian vegetation. Requires adequate basking sites and sandy banks or grassy open fields to deposit eggs.	**Possible.** This species is known to occur in parts of the Kaweah River, and it could occur within the riverine habitat throughout the site.

Species	Status*	Habitat	Occurrence within the Site
Pallid bat (*Antrozous pallidus*)	CSSC	Found in grasslands, chaparral, and woodlands, where it feeds on ground- and vegetation-dwelling arthropods, and occasionally takes insects in flight. Prefers to roost in rock crevices, but may also use tree cavities, caves, bridges, and other human-made structures.	**Possible.** Suitable foraging and roosting habitats were present within the project site. This species could forage over the riparian habitats and could roost in bridges and buildings within and adjacent to the site.
San Joaquin kit fox (*Vulpes macrotis mutica*)	FE, CT	Opportunistically forages in a variety of habitats. Dens in burrows within alkali sink, valley grassland, and woodland habitats in valleys and adjacent foothills and in human-made structures in cities, rangeland, and agricultural areas.	**Unlikely.** While suitable habitat occurs within the District's boundaries, this species would not occur within the project site.
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.	**Possible.** There is the potential for this species to nest in trees within and adjacent to the site. There are several known previously used nest trees within the District's boundaries and some trees along portions of the project site.
Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*)	FE, CE	Inhabits saltbush scrub and sink scrub communities in the Tulare Lake Basin of the southern San Joaquin Valley. This species needs soft friable soils to burrow.	**Unlikely.** The annual grassland and alkali desert scrub habitats within the District may provide suitable habitat for this species, however these habitats are absent from the project site.
Tricolored blackbird (*Agelaius tricolor*)	CT, CSSC	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 foraging in dairy farm feed fields.	**Possible.** Some of the riverine habitat within the site could provide suitable habitat for this species. The abundance of agricultural fields present within the District's boundaries provide suitable foraging grounds.
Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)	FT	Lives in mature elderberry shrubs in the Central Valley and adjacent foothills from Tehama County south through Merced and Mariposa Counties with two scattered populations in Madera and Fresno Counties. Adults are active from March to June.	**Absent.** The project site is located outside of the current range of this species.
Vernal pool fairy shrimp (*Branchinecta lynchi*)	FT	Occupies vernal and seasonal pools, with clear to tea-colored water, in grass or mud-bottomed swales, and basalt depression pools.	**Unlikely.** There are several recorded observations of this species within the District's northern boundary, along Cottonwood Creek and Cross Creek of the project site. This area contains undeveloped grassland and vernal pools, which provides suitable habitat for this species, however these habitats are absent from the project site.
Vernal pool tadpole shrimp (*Lepidurus packardi*)	FE	Occurs in vernal pools, clear to tea-colored water, in grass or mud-bottomed swales, and basalt depression pools.	**Unlikely.** There are several recorded observations of this species within the District's northern boundary, along Cottonwood Creek and Cross Creek of the project site. This area contains undeveloped grassland and vernal pools, which provides suitable habitat for this species, however these habitats are absent from the project site.

Species	Status*	Habitat	Occurrence within the Site
Western mastiff bat (*Eumops perotis californicus*)	CSSC	Found in open, arid to semi-arid habitats, including dry desert washes, flood plains, chaparral, oak woodland, open ponderosa pine forest, grassland, and agricultural areas, where it feeds on insects in flight. Roosts most commonly in crevices in cliff faces but may also use high buildings and tunnels.	**Unlikely.** Suitable foraging and roosting habitats were present within the District's boundaries. This species could forage over the riverine habitat within the site, but it would not be expected to roost in the project site.
Western spadefoot (*Spea hammondii*)	FPT, CSSC	The majority of the time this species is terrestrial and occurs in small mammal burrows and soil cracks, sometimes in the bottom of dried pools. 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 or seasonal pools, that hold water for a minimum of three weeks, are necessary for breeding.	**Unlikely.** While there have been several recorded observations of this species within the District's northern boundary, they would not be expected to breed or aestivate within the site.
Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)	FT, CE	Suitable nesting habitat in California includes dense riparian willow-cottonwood and mesquite habitats along a perennial river. Once common in the California Central Valley, as well as coastal valleys and riparian habitats east of the Sierra Nevada, habitat loss now constrains the California breeding population to small numbers of birds.	**Absent.** While riparian vegetation is present within portions of the site, there is only one recorded observation in 1919 of this species within the District's boundaries which is listed as extirpated. Furthermore, this species is believed to no longer occur within Tulare or Kings Counties.

***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	CCE	California Endangered (Candidate)
FPT	Federally Threatened (Proposed)	CT	California Threatened
FC	Federal Candidate	CFP	California Fully Protected
		CSSC	California Species of Special Concern

CNPS LISTING

1B	Plants rare, threatened, or endangered in California and elsewhere.
2B	Plants rare, threatened, or endangered in California, but more common elsewhere.

4.4.2 IMPACT ANALYSIS

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?

Less than Significant Impact with Mitigation Incorporated.

General Project-Related Impacts

The Project has the potential to impact a number of sensitive resources, as described in more detail in the following sections. Impacts to these resources would be considered a potentially significant impact under CEQA and may be a violation of state and federal laws. Implementation of mitigation measures BIO-1 through BIO-10 will help reduce potential impacts to these resources to a less than significant level under CEQA and will help with complying with state and federal laws protecting these resources. Said mitigation measures can be found in Section 4.4.3 below.

Project-Related Impacts to Special Status Plant Species

Of the 23 regionally occurring special status plant species, 22 are considered absent from or unlikely to occur within the site due to past or ongoing disturbance and/or the absence of suitable habitat. These species include: alkali-sink goldfields, brittlescale, Calico monkeyflower, California alkali grass, California jewelflower, California satintail, Coulter's goldfields, Earlimart orache, Greene's tuctoria, heartscale, Hoover's spurge, Kaweah brodiaea, lesser saltscale, mud nama, recurved larkspur, San Joaquin adobe sunburst, San Joaquin Valley Orcutt grass, spiny-sepaled button-celery, striped adobe-lily, subtle orache, vernal pool smallscale, and Winter's sunflower. Since it is unlikely that these species would occur onsite, implementation of the Project should have no impact on these 22 special status species through construction mortality, disturbance, or loss of habitat. Mitigation measures are not warranted.

Sanford's arrowhead has the potential to occur within the Project site. Projects that adversely affect Sanford's arrowhead or result in the mortality of this species, would be considered a significant impact under CEQA.

Implementation of mitigation measures BIO-11 through BIO-13 will reduce potential impacts to Sanford's arrowhead to a less than significant level under CEQA. Said mitigation measures can be found in Section 4.4.3 below.

Project-Related Mortality and/or Nest Abandonment of Migratory Birds, Raptors, and Special Status Birds, Including Loggerhead Shrike, Swainson's Hawk, and Tricolored Blackbird

Of the 29 regionally occurring special status animal species, 21 are considered absent from or unlikely to occur within the site due to past or ongoing disturbance and/or the absence of suitable habitat. These species include: American badger, blunt-nosed leopard lizard, Buena Vista Lake ornate shrew, California condor, California tiger salamander, conservancy fairy shrimp, foothill yellow-legged frog, fisher, Fresno kangaroo rat, giant kangaroo rat, mountain plover, northern California legless lizard, northern leopard frog, San Joaquin kit fox, Tipton kangaroo rat, valley elderberry longhorn beetle, vernal pool fairy shrimp, vernal pool tadpole shrimp, western mastiff bat, western spadefoot, and western yellow-billed cuckoo.

Since it is unlikely that these species would occur onsite, implementation of the Project should have no impact on these 21 special status species through construction mortality, disturbance, or loss of habitat. Mitigation measures are not warranted. The remaining regionally occurring special status animal species and potential impacts to them are discussed below.

Project-Related Mortality and/or Nest Abandonment of Migratory Birds, Raptors, and Special Status Birds, Including Loggerhead Shrike, Swainson's Hawk, and Tricolored Blackbird

The Project area contains suitable nesting and foraging habitat for a variety of protected bird species, such as migratory birds, raptors, and special status birds, including loggerhead shrike, Swainson's hawk, and tricolored blackbird. It is anticipated that during the nesting bird season, protected birds including loggerhead shrike, Swainson's hawk, and tricolored blackbird could nest on the ground or in shrubs, trees within the site and forage within the site. Burrowing owl (BUOW) could also nest, roost, or forage within the site, however potential impacts to this species and mitigation measures are described in the following subsection. Protected birds located within or adjacent to the site during construction activities have the potential to be injured or killed. In addition to the direct "take" of protected birds within the site or adjacent areas, these birds nesting in these areas could be disturbed by project-related activities resulting in nest abandonment. Projects that adversely affect the nesting success of protected birds or result in the mortality of these birds would be a violation of state and federal laws and considered a significant impact under CEQA.

While foraging habitat for protected birds is present on the Project site, suitable foraging habitat is located adjacent to the site and within the vicinity of the site. In addition, birds would be able to continue to forage within the site following project activities. Loss of the foraging habitat from implementation of the Project is not considered a significant impact. Implementation of mitigation measures BIO-14 through BIO-16 will reduce potential impacts to protected nesting birds to a less than significant level under CEQA and will help the Project comply with State and federal laws protecting these bird species. Said mitigation measures can be found in Section 4.4.3 below. Mitigation measures specific to BUOW are presented in the following subsection (i.e., BIO-17 through BIO-19).

Project-Related Mortality and/or Disturbance to Burrowing Owl

As discussed in the previous subsection, portions of the Project site contained suitable nesting, roosting, and foraging habitat for BUOW. If suitable habitat or burrows are observed within the work area during the general pre-construction surveys, a biologist will conduct the following mitigation measures. Construction activities that adversely affect the nesting success of BUOWs or result in the mortality of individuals constitute a violation of State and federal laws and would be considered a significant impact under CEQA. While the project site may impact some potential nesting/roosting and foraging habitat for BUOW, there is abundant habitat adjacent to the site that could be used, and implementation of the Project would not reduce potential nesting, roosting, and foraging habitat for this species. Therefore, no mitigation measures are warranted for loss of BUOW nesting/roosting and foraging habitat.

Implementation of mitigation measures BIO-17 through BIO-19 will reduce potential impacts to nesting and roosting BUOW to a less than significant level under CEQA and help the project comply with State and federal laws protecting this avian species. Said mitigation measures can be found in Section 4.4.3 below.

Project-Related Mortality and/or Disturbance to Crotch's Bumble Bee

Habitats within portions of the site are likely to be suitable for foraging, nesting, and overwintering Crotch's bumble bee. Queens are actively flying for only two months from March until May and reach maximum flying activity in April. Males are generally present and flying from May to September with peak flying activity occurring in July. Workers of this species are present and flying from April to August, with peak flying activity occurring between May and June. There is likely abundant foraging habitat adjacent to the site that could be used, and implementation of the Project is unlikely to significantly reduce potential foraging habitat for this species. Therefore, no mitigation measures are warranted for loss of foraging habitat. Construction activities occurring within nesting or overwintering habitat could result in

injury, mortality, displacement, disturbance, or inhibit the movement of this species, and would be considered a significant impact under CEQA and a violation of CESA.

Implementation of mitigation measures BIO-20 and BIO-21 will reduce potential impacts to nesting and overwintering Crotch's bumble bee to a less than significant level under CEQA will help the Project comply with State laws protecting this species. Said mitigation measures can be found in Section 4.4.3 below.

Project-Related Mortality and/or Disturbance to Monarch Butterfly

Habitats within portions of the Project site are likely to be suitable for foraging Monarch butterflies. Monarchs could travel through the site during the breeding season and lay eggs on milkweeds. While it could travel through the site, roosting habitat was absent. There is likely abundant foraging habitat adjacent to the site that could be used, and implementation of the project is unlikely to significantly reduce potential foraging habitat for this species. Therefore, no mitigation measures are warranted for loss of foraging habitat. Construction activities during the breeding season could result in injury, mortality, displacement, or disturbance and would be considered a significant impact under CEQA.

Implementation of mitigation measures BIO-22 through BIO-24 will reduce potential impacts to Monarch eggs and larvae to a less than significant level under CEQA will help the Project comply with federal laws protecting this species. Said mitigation measures can be found in Section 4.4.3 below.

Project-Related Mortality and/or Disturbance of Pallid bats and Maternity Roosting Bats

Trees with natural cavities within the Project site may support tree-roosting species of bats such as pallid bats, and bridges within the site could support maternity roosting bats. Minor maintenance activities typically have no impact on bats. However, more substantial maintenance operations, including replacement or strengthening of structures above water level, could result in a significant impact. Sealing cracks and crevices could entomb bats or cause abandonment of young; vibrations from noise disturbances could cause awakening from hibernation; and maintenance activities involving the replacement of bridge components or the removal of trees could result in mortality or roost abandonment. Roosting habitat becomes especially sensitive to bat populations during the maternity season (March 1 to September 30) when pups are maturing and during the overwintering season (December 1 through February 28). Projects that impact maternity roosting bats or roosting pallid bats would be considered a significant impact under CEQA.

Implementation of general mitigation measures BIO-1 through BIO-10 discussed previously and mitigation measures BIO-25 through BIO-28 will reduce potential impacts to roosting maternity bats and roosting special status bats to a less than significant level under CEQA. Said mitigation measures can be found in Section 4.4.3 below.

Project-Related Mortality and/or Disturbance to Northwestern Pond Turtle

Northwestern pond turtles are known to occur within the Project site. Individuals may enter the work area during construction and be vulnerable to mortality should they seek cover in or under parked equipment or move through the site while equipment is being operated. Furthermore, if a northwestern pond turtle were to nest or overwinter in or along any banks within the site, the individual could be killed or disturbed by use of equipment or destruction of substrate.

Projects that result in the mortality of northwestern pond turtle would be considered a potentially significant impact under CEQA. General mitigation measures BIO-1 through BIO-10 limit construction activities within the active channel, require daily inspection of site and equipment, require a pre-construction survey by a qualified biologist, and other measures that would help the project avoid and minimize impacts to northwestern pond turtle. These measures will adequately reduce potential impacts

to northwestern pond turtle to a less than significant level under CEQA. No additional mitigation measures are required.

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?

Less than Significant Impact with Mitigation Incorporated. Riparian habitat is likely present along portions of the Project site and Great Valley Valley Oak Riparian Woodland could occur within the Project site. These resources could be impacted during maintenance activities. Project-related impacts to riparian habitat and natural communities of special concern would be considered a significant impact under CEQA. A Lake or Streambed Alteration Agreement will be obtained for work within these waterways.

Implementation of the general mitigation measures (BIO-1 through BIO-10) will avoid and minimize impacts to these resources to a less than significant level under CEQA. No additional mitigation measures are required.

c) Would the project 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?

Less than Significant Impact with Mitigation Incorporated. The Project involves ongoing maintenance activities within the rivers, streams, creeks, and sloughs of the Kaweah River System. The USFWS National Wetlands Inventory Map was consulted for known wetlands in the area and riverine, freshwater pond, lake, freshwater emergent wetland, and freshwater forested/shrub wetland was classified to be within the boundaries of site. Project-related impacts to some or all of these waters would be considered a potentially significant impact under CEQA. Impacts to waters of the U.S. are also subject to the permit requirements of Sections 401 and 404 of the Clean Water Act and impacts to waters of the State are subject to the permit requirements of Section 401 of the Clean Water Act and California Fish and Game Code. The placement of fill within any wetlands or other jurisdictional features may require a 401 Water Quality Certification from the RWQCB, 404 permit from the USACE, and a Lake or Streambed Alteration Agreement from CDFW. Some of the waterways may be considered a designated floodway or regulated stream under the Central Valley Flood Protection Board (CVFPB). If maintenance is required within any designated floodways or regulated streams, an encroachment permit may be required.

If construction involves ground disturbance over an area greater than one acre, the project would need to obtain a Construction General Permit under the Construction Storm Water Program administered by the RWQCB. A prerequisite for this permit is the development of a Storm Water Pollution Prevention Plan to ensure construction activities do not adversely affect water quality. This plan will need to be prepared in support of the Construction General Permit application.

Implementation of mitigation measure BIO-29 will reduce potential impacts to waters to a less than significant level under CEQA and will comply with State and federal laws protecting these waters.

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?

Less than Significant Impact with Mitigation Incorporated. The water features of the Project site could provide potential wildlife movement corridors for a variety of wildlife. The Project site is located in a

fragmented region often disturbed by intensive agricultural cultivation practices and these water features could be used as corridors through this region.

The site has suitable features that could be used as native wildlife nursery sites. Trees with natural cavities within the site may support tree-roosting species of bats such as pallid bats and bridges may be used by other bats for wildlife nursery sites. Project-related impacts to any native wildlife nursery sites would be considered a significant impact under CEQA.

Implementation of the general mitigation measures (BIO-1 through BIO-10) will prevent impacts to wildlife movement corridors and mitigation measures BIO-25 through BIO-28 will avoid and minimize impacts to native wildlife nursery sites. Impacts would be temporary, and wildlife may be able to continue using the site at night while construction is occurring and would be able to continue utilizing it after construction activities are completed. These mitigation measures will minimize impacts to these resources to a less than significant level under CEQA. Said mitigation measures can be found in Section 4.4.3 below.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

No Impact. The Project appears to be consistent with the goals and policies of the Kings County General Plan and the Tulare County General Plan. There are no known Habitat Conservation Plans (HCPs) or Natural Communities Conservation Plan (NCCPs) in the Project vicinity. There would be no impact.

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

No Impact. The Project is not located within the boundaries of an adopted HCP, NCCP, or other approved local, regional, or State habitat conservation plan. There would be no impact.

4.4.3 MITIGATION

BIO-1 (*WEAP Training*): Prior to initiating construction activities (including staging and mobilization), all personnel associated with project construction will attend a 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 work area. The specifics of this program will 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. This training will discuss special status species, describe the laws and regulations in place to provide protection of these species, identify the penalties for violation of applicable environmental laws and regulations, and include a list of required protective measures to avoid "take." A fact sheet summarizing this information, along with photographs or illustrations of sensitive species with potential to occur on the site, will also be prepared for distribution to all contractors, their employees, and all other personnel involved with construction of the project. All trainees will sign a form documenting that they have attended WEAP training and understand the information presented to them.

BIO-2 (*Operational Hours*): Construction activities will be limited to a half hour after sunrise through a half hour before sunset, when possible, to reduce potential impacts to wildlife movement corridors.

BIO-3 *(Access Routes*): In order to reduce disturbance to wildlife species and habitat occurring adjacent to work areas, equipment access into work areas will be limited to ingress/egress corridors from existing roads. If new access through streams or wetlands is necessary, the vehicle route will be constructed in an appropriate location chosen by a qualified biologist based on minimal disturbance to the riparian corridor.

BIO-4 (Avoid Removal of Native Trees): Maintenance projects will minimize the trimming or removal of living native trees (DBH 4" or greater) within the upper half of Type 1 channels. The trimming or removal will be based upon one or more of the following criteria:

a) Be in clear danger of falling into the channel;
b) Significantly reduce channel capacity;
c) Would result in accelerated erosion; and
d) Obstruct or impede access routes.

BIO-5 (*Daily Inspection of Site and Equipment*): The construction crew will inspect the work area each day prior to the start of work. If any special status species are observed, they will be avoided and allowed to passively leave the site prior to the initiation of construction. Construction crews will inspect areas beneath equipment at the beginning and end of each workday to prevent mortality or injury to special status species by vehicle strike. Furthermore, equipment will be inspected for leaks prior to the start of work each day to prevent contamination of water within the channel.

BIO-6 (*Avoid Impacts to Active Channel*): When feasible, maintenance projects involving the removal of sand or operation of heavy equipment within the streambed will occur when the channel is dry.

BIO-7 (*General Pre-Construction Surveys and Avoidance Buffers*): Pre-construction surveys for special status plants, animals, and Natural Communities of Special Concern will be conducted by a qualified biologist within 30 days prior to the beginning of construction activities. Pre-construction surveys within Natural Communities of Special Concern will include photographs documenting existing site conditions. If sensitive biological resources are present onsite, the biologist will establish an appropriate avoidance buffer zone and label sensitive resources or areas of avoidance with flagging, fencing, or other easily visible means.

BIO-8 (*Post-Construction Survey and Photographs*): For all construction activities within Natural Communities of Special Concern, a qualified biologist will perform a post-construction survey within 30 days of completion and capture representative pictures of the work areas. Pre- and post-construction photographs documenting site conditions will be compiled and sent to CDFW for review yearly. If unforeseen impacts have occurred within Natural Communities of Special Concern, CDFW will be consulted immediately.

BIO-9 (*Avoidance of Special Status Species*): If a special status animal is observed onsite, they will be avoided and allowed to passively leave the site prior to the start of construction activities. On discovery of active nests, dens, burrows, roosts of a special status or

otherwise protected species (i.e., migratory bird, USFWS- or CDFW-listed species, California special status species, or rare plant) near work areas, the biologist will determine avoidance buffers based on applicable CDFW guidelines and/or the biology of the species in question. Avoidance buffers will be identified with flagging, fencing, or other easily visible means. If an active nest, den, burrow, or roost of a special status or otherwise protected species is present within the work area and avoidance is not feasible, CDFW and/or USFWS will be consulted to determine the best course of action.

BIO-10 (*BMPs*): The project proponent will require that all workers employ the following best management practices (BMPs) in order to avoid and minimize potential impacts to special status species:

- Vehicles will observe a 15-mph speed limit while on unpaved access routes.
- The presence of any special status species will be reported to the project's qualified biologist, who will submit the occurrence to the CNDDB. If necessary, the biologist will report the occurrence to CDFW and/or USFWS.

BIO-11 (*Focused Survey*): Since this species is perennial and can be identified throughout the year a qualified botanist/biologist (someone able to identify Sanford's arrowhead) will conduct focused botanical surveys prior to the start of construction if suitable habitat for Sanford's arrowhead occurs within the work area according to CDFW's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (2018) for areas where ground disturbance will occur.

BIO-12 (*Avoidance*): If any special status plants are identified during a survey an avoidance buffer and exclusion fencing, if necessary, will be placed around the area to avoid the plants and their root system.

BIO-13 (*Formal Consultation*): If rare plant individuals or populations are detected within project work areas during the focused botanical surveys, and the plants cannot be avoided, the project proponent will initiate consultation with CNPS to determine next steps for relocation.

BIO-14 (*Avoidance*): The project's construction activities will occur, if feasible, between September 16 and January 31 (outside of the nesting bird season) to avoid impacts to nesting birds.

BIO-15 (*Pre-construction Surveys*): If activities must occur within the nesting bird season (February 1 to September 15), a qualified biologist will conduct a single take avoidance survey for Swainson's hawk nests onsite and within a 0.5-mile radius within seven calendar days prior to the start of construction. This survey will be conducted in accordance with the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (Swainson's Hawk Technical Advisory Committee, 2000), or current guidance. The Swainson's hawk survey will not be completed between April 21 to June 10 due to the difficulty of identifying nests during this time of year. A qualified biologist will conduct a single take avoidance survey for tricolored blackbird nests onsite and within a 300-foot radius within seven calendar days prior to the start of construction. This survey will be conducted in accordance with CDFWs *Staff Guidance Regarding Avoidance of Impacts to Tricolored Blackbird Breeding Colonies on Agricultural Fields* (California Department of Fish and Wildlife, 2015), or

current guidance. The surveys would also include inspecting for nesting migratory birds within and up to 100 feet outside of the site and for loggerhead shrike and other nesting raptors within and up to 500 feet outside of the site. All raptor nests would be considered "active" upon the nest-building stage. If no active nests are observed, no further mitigation is required.

BIO-16 (*Avoidance Buffers*): On discovery of any active nests or breeding colonies near work areas, a qualified biologist will determine appropriate avoidance buffer distances based on applicable CDFW and/or USFWS guidelines, the biology of the species, conditions of the nest(s), and the level of project disturbance. If necessary, avoidance buffers will be identified with flagging, fencing, or other easily visible means, and will be maintained until the biologist has determined that the nestlings have fledged.

BIO-17 (*Pre-construction Take Avoidance Survey*): A qualified biologist (someone familiar with the identification and sign of this species) will conduct a pre-construction take avoidance survey for BUOW and suitable burrows, in accordance with CDFW's *Staff Report on Burrowing Owl Mitigation* (2012), within seven (7) days prior to the start of construction activities if suitable habitat or burrows are observed during the general pre-construction survey (BIO-7). The survey shall include the proposed work area and surrounding lands up to 500 feet. If no BUOW individuals or active burrows are observed, no further mitigation is required.

BIO-18 (*Avoidance*): If an active BUOW burrow is detected, avoidance buffers will be implemented. A qualified biologist will determine appropriate avoidance buffer distances based on CDFW's 2012 *Staff Report on Burrowing Owl Mitigation*, the biology of BUOW, conditions of the burrow(s), and the level of project disturbance, which can be found in the table below. If necessary, avoidance buffers will be identified with flagging, fencing, visual screens, or other easily visible means, and will be maintained until the biologist has determined that nestlings have fledged and all BUOW have left the site.

Level of Disturbance				
Location	Time of Year	Low	Med	High
Nesting sites	April 1-Aug 15	200 meters	500 meters	500 meters
Nesting sites	Aug 16-Oct 15	200 meters	200 meters	500 meters
Nesting sites	Oct 16-Mar 31	50 meters	100 meters	500 meters

BIO-19 (*ITP* and *Passive Relocation*): If an active BUOW burrow is detected within the proposed work area and cannot be avoided, it is recommended the project obtain an Incidental Take Permit (ITP) in order to implement a passive relocation plan and protect the project from "take" of this species.

BIO-20 (*Flying Bumble Bee and Nest Surveys*): If suitable nesting or overwintering habitat (i.e. burrows, old bird nests, rock piles, cavities in dead trees, or significant leaf litter) is observed within the work area during the general pre-construction surveys, a qualified biologist (someone who is familiar with and can identify bumble bees) will conduct three flying bumble bee and nest surveys during the peak flying periods (April, May to June, and July) prior to initial ground disturbing activities. The biologist will walk throughout the site and up to 100 feet outside of the site during the optimal time of the day to inspect for bumble bees and any nests. If an individual is observed, it will be followed

until it can be determined if a nest is present within the survey boundary. If no nests are observed, no further mitigation is required.

BIO-21 (*Identification and Protection Plan*): Bumble bee individuals need to be captured to be identified. If a bumble bee nest is observed, no project activities will occur within 50 feet of the nest until a plan to identify the species using the nest and protect nesting and overwintering Crotch's bumble bee has been submitted to CDFW and approved in writing by CDFW.

BIO-22 (*Pre-construction Surveys*): A survey of the project site will be conducted by a qualified biologist (someone who can identify the species and is familiar with the species' host plants) within 15 days prior to construction activities to determine if milkweeds plants are located within the site during the breeding season (February 1 to August 31). If no milkweed plants are observed, no further mitigation is required.

BIO-23 (*Avoidance*): If milkweeds are observed within the site during the breeding season (February 1 to August 31), an avoidance buffer will be placed around the area as to not to disturb the plant or its root system. The buffer will be left in place until a qualified biologist has determined the buffers are no longer warranted.

BIO-24 (*Consultation with USFWS if Listed*): In the event a milkweed plant is detected during the pre-construction survey and cannot be avoided and this species is listed under the ESA prior to this observation, consultation with USFWS will be completed to avoid take.

BIO-25 (*Pre-Construction Survey*): If suitable habitat is observed within the work area during the general pre-construction surveys (BIO-7) and construction activities fall between March 1 and September 30 (bat maternity season) and December 1 through February 28 (overwintering season) a qualified biologist (someone who is familiar with and can identify bat roosts) will conduct a pre-construction survey to identify active bat roosting locations in trees or bridges near the work area. A qualified biologist will conduct the survey 7 days or less prior to construction.

BIO-26 (*Disturbance to Trees and Bridges*): If any trees must be removed or any bridges must be disturbed, a qualified biologist will inspect these features prior to these activities to verify that there are no active bat roosts. Once the feature is deemed clear of bats, these activities will be initiated within two days.

BIO-27 (*Avoidance Buffers*): On discovery of any sensitive bat roosts near work areas, a qualified biologist will determine appropriate avoidance buffers based on the biology of the species, conditions of the roost(s), and the level of project disturbance, if appropriate. If necessary, avoidance buffers will be identified with flagging, fencing, or other easily visible means, and will be maintained until the biologist has determined that the roost will no longer be impacted by construction.

BIO-28 (*Maternity and Overwintering Roost Avoidance*): During the maternity roosting season (March 1 through September 30) project activities will not occur within 100 feet of any identified maternity bat roost between sunset and sunrise. During the pallid bat overwintering roosting season (December 1 through February 28) project activities will not occur within 100 feet of any identified overwintering bat roost. Lighting is not to be used near roosts where it would shine on or into the roost entrance. Combustion

equipment, such as generators, pumps, and vehicles are not to be parked, operated, under or adjacent to the roost.

BIO-29 (***Permits***)**:** If necessary, permits with USACE, RWQCB, CDFW, and CVFPB will be obtained for work within the rivers, streams, creeks, and sloughs of the project site. These permits, certifications, and agreements would ensure there are no indirect downstream effects to jurisdictional waters.

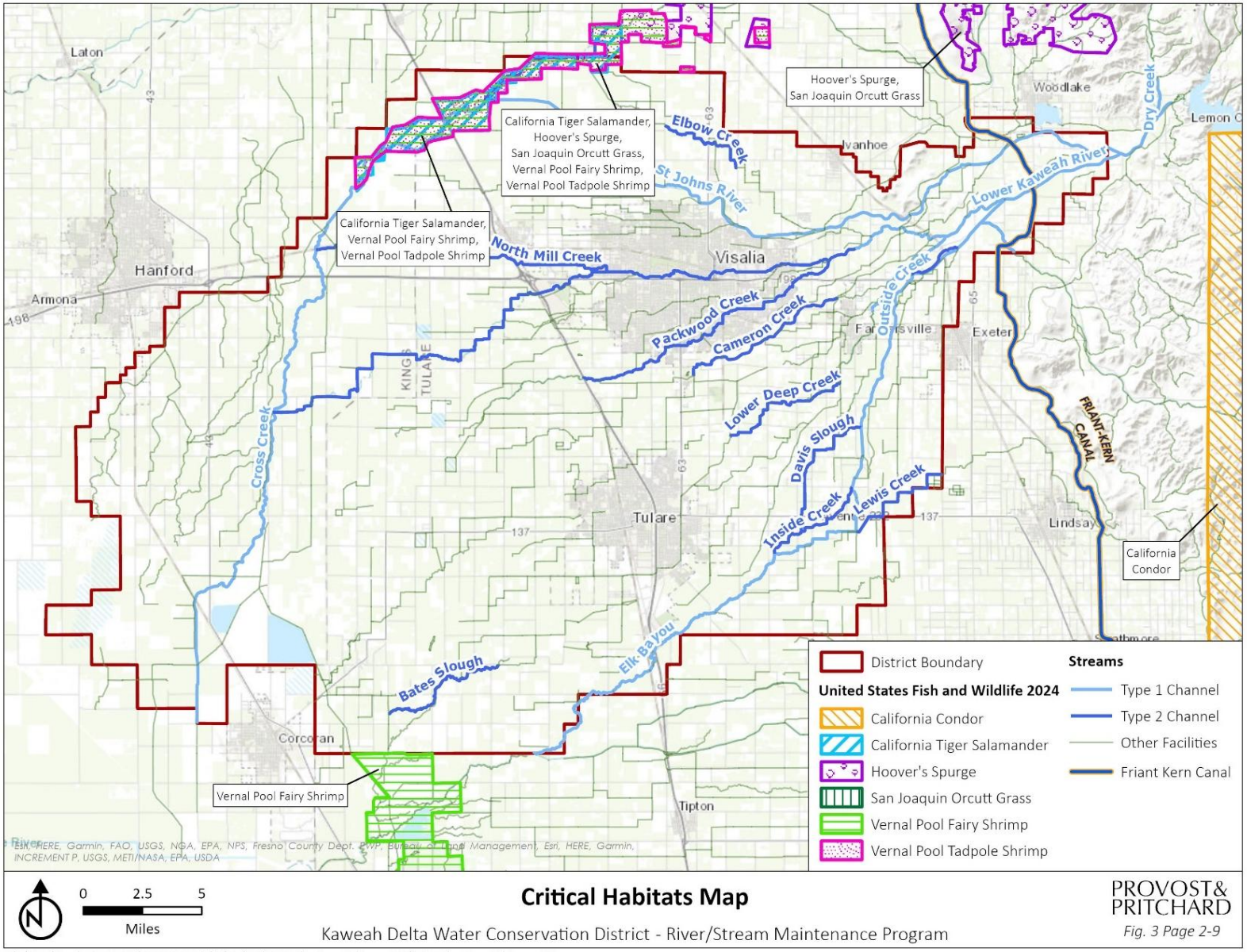

Figure 4-2: Habitat Map

4.5 CULTURAL RESOURCES

Table 4-8: Cultural Resources Impacts

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?	☐	☒	☐	☐

4.5.1 BASELINE CONDITIONS

The Project site lies within Tulare and Kings Counties, which occupy an archeologically and historically rich part of the San Joaquin Valley.

4.5.1.1 RECORDS SEARCH

On January 20, 2025, a cultural resource records search was requested from the South San Joaquin Valley Information Center (SSJVIC) of the California Historical Resources Information System (CHRIS) at California State University in Bakersfield, California. The purpose of this request was to identify and review prior cultural resource studies and previously recorded cultural resources on or near the APE. The records search included prior cultural resources investigation reports conducted, previously recorded resources within the Area of Potential Effects (APE) and the 1.0- mile radius around the APE. Also included in research were cultural resource records as well as the Historic Properties Directory of the Office of Historic Preservation list, General Land Office Maps, Archaeological Determinations of Eligibility list, and the California Inventory of Historic Resources list. On February 3, 2025, the SSJVIC provided the results of the CHRIS cultural records search. The search confirmed there have been 448 previous cultural resource studies conducted within the Project APE. The search also identified 781 cultural resources and 20 known but unrecorded resources within the Project APE. There are 31 recorded resources within the Project APE that are listed in the National Register of Historic Places (NRHP). There are 40 recorded resources within the Project APE listed in the California Register of Historical Resources. Additionally, there are three California State Historic Landmark resources within the Project APE.

4.5.1.2 NATIVE AMERICAN OUTREACH

A Sacred Lands File (SLF) search was requested from the Native American Heritage Commission (NAHC) on January 20, 2025. The objective of the SLF search was to identify any known places of spiritual, sacred activity or traditional use or other resources of importance. The results were positive. The NAHC also included contact information of local Native American representatives who may have knowledge or interest in sharing information of resources of sacred significance present in or near the APE. Each individual listed was sent a nongovernmental outreach letter and a map notifying them of the Project and asking if they had any knowledge of the Project area or surrounding vicinity. As of the date of this report, two responses were received by the Native American representatives. On January 30, 2025, David Alvarez, Tribal Chairman for the Traditional Choinumni Tribe responded by stating that the Project is out of their historical land use and would be unable to comment. On February 12, 2025, Samantha McCarty, Cultural Specialist II with the Santa Rosa Rancheria Tachi Yokut Tribe requested to schedule a meeting with the District and P&P staff to

discuss the Project in more detail. On March 3, 2025, a meeting was held to discuss the Project in more detail. Participants included one member of the Santa Rosa Rancheria Tachi Yokut Tribe, one member of the District, and three staff members of P&P. During this meeting, the Santa Rosa Rancheria Tachi Yokut Tribe addressed their concerns regarding potential project disturbance to places of spiritual, sacred activity or traditional use or other resources of importance. Due to the large Project APE and the fact that no cultural resources have been identified during prior and existing maintenance activities, the District will implement appropriate measures to satisfy and protect cultural and tribal cultural resources. The District will include standard mitigation measures, as seen in more detail below. Said mitigation measures are required under State law to protect cultural and tribal cultural resources.

4.5.2 IMPACT ANALYSIS

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

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

Less than Significant Impact with Mitigation Incorporated. As mentioned above, the CHRIS results determined that there were 781 cultural resources and 20 known but unrecorded resources within the Project APE. Furthermore, the NAHC SLF records search were positive. The high number of resources and positive results is due to the fact that the Project APE covers as much land as it does. While the Project APE covers so much land, the actual maintenance activities would only take place within the channels of Kaweah Basin waterways, which does not account for the majority of land in the Project APE. However, indigenous populations are known to have inhabited along natural waterways such as rivers and streams as they were a source for food, water, and other resources. Thus, there is a possibility of encountering buried cultural resources during Project activities. Therefore, mitigation measure CUL-1 outlined below will be implemented in order to reduce impacts to less than significant.

c) Would the project disturb any human remains, including those interred outside of dedicated cemeteries?

Less than Significant Impact with Mitigation Incorporated. Based upon the CHRIS and NAHC results and the fact that the Project area was dominated by natural watercourses and likely contained a rich supply of natural resources for indigenous populations, there is a possibility of encountering buried cultural resources during Project ground disturbing activities. Therefore, mitigation measure CUL-2 outlined below will be implemented in order to reduce impacts to less than significant.

4.5.3 MITIGATION

CUL-1 (Archaeological Remains) Should archeological remains or artifacts be unearthed during any stage of project activities, work in the area of the discovery shall cease until the area is evaluated by a qualified archaeologist. If mitigation is warranted, the project proponent shall abide by recommendations of the archaeologist.

CUL-2 (Human Remains) In the event that human remains are discovered on the Project site, the Tulare or Kings County Coroner must be notified of that discovery (Health and Safety Code Section 7050.5) and all activities in the immediate area if the find or in any nearby area reasonably suspected of overlie adjacent human remains must cease until appropriate and lawful measures have been implemented. If the Coroner determines that the remains are not recent, but rather of Native American origin, the Coroner shall

notify the Native American Heritage Commission (NAHC) in Sacramento within 24 hours to permit the NAHC to determine the most likely descendent of the deceased Native American.

4.6 ENERGY

Table 4-9: Energy Impacts

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?	☐	☐	☐	☒

4.6.1 BASELINE CONDITIONS

The Project is located in Tulare and Kings County. The Project area covers a large span of land, which is either served by PG&E for gas and electric, or Southern California Edison for electric, and Southern California Gas for gas services.

4.6.2 IMPACT ANALYSIS

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?

Less than Significant Impact. As discussed in Section 4.3 the Project would not exceed any air emission thresholds. The Project would also be required to comply with California Code of Regulations Title 13, Motor Vehicles, Section 2449 (d)(2)-Idling, which limits idling times of any necessary construction vehicles to no more than five minutes, thereby precluding unnecessary and wasteful consumption of fuel because of unproductive idling of construction equipment.

Energy consumption of non-residential uses is currently governed by the 2022 California Building Code, Part 6 for structures, and Title 20 of the California Code of Regulations for appliances. Energy consumption is anticipated to decrease over time as more energy efficient standards take effect and energy-consuming equipment reaches its end-of-life and necessitates replacement. Therefore, impacts would be less than significant.

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

No Impact. State and local authorities regulate energy use and consumption. These regulations at the State level are intended to reduce energy use and greenhouse gas (GHG) emissions. These include, among others, Assembly Bill (AB) 1493 – Light-Duty Vehicle Standards; California Code of Regulations Title 24, Part 6 – Energy Efficiency Standards; and California Code of Regulations Title 24, Parts 6 and 11 – California Energy Code and Green Building Standards. The Project would not conflict with or obstruct a State or local plan for renewable energy or energy efficiency. Therefore, there would be no impact.

4.7 GEOLOGY AND SOILS

Table 4-10: Geology and Soils Impacts

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 Uniform Building Code (1994) creating substantial direct or indirect risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geological feature?	☐	☐	☒	☐

4.7.1 BASELINE CONDITIONS

4.7.1.1 GEOLOGY AND SOILS

The Project is located in Tulare and Kings County, in the southern section of California's Great Valley Geomorphic Province, or Central Valley. The Sacramento Valley makes up the northern third and the San Joaquin Valley makes up the southern two-thirds of the geomorphic province.[4] Both valleys are watered by large rivers flowing west from the Sierra Nevada Range, with smaller tributaries flowing east from the Coast Ranges. Most of the surface of the Great Valley is covered by Quaternary (present day to 1.6 million years ago) alluvium. The sedimentary formations are steeply upturned along the western margin due to the

[4] (California Department of Conservation, 2002)

uplifted Sierra Nevada Range. From the time the Valley first began to form, sediments derived from erosion of igneous and metamorphic rocks and consolidated marine sediments in the surrounding mountains have been transported into the Valley by streams.

4.7.1.2 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, located approximately 50 miles south/southwest of the Project site.[5] 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 Fault is approximately nine miles southwest of the site and an unnamed fault located near Rag Gulch is approximately seven miles southeast.[6]

4.7.1.3 LIQUEFACTION

The potential for liquefaction, which is the loss of soil strength due to seismic forces, is dependent on soil types and density, the groundwater table, and the duration and intensity of ground shaking. Although no specific liquefaction hazard areas have been identified in the 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 Tulare and Kings Counties, liquefaction hazards would be negligible. Soil conditions are key factors in selecting locations for direct groundwater recharge projects. Using the United States Department of Agriculture NRCS soil surveys of Tulare and Kings Counties, an analysis of the soils in the District was performed. Soils in the area consist mostly of clay and loam.

4.7.1.4 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 dominated by sandy loam, with a low to moderate risk of subsidence.

4.7.1.5 DAM AND LEVEE FAILURE

Much of the Project area lies within the Terminus Dam (Lake Kaweah) inundation area.[7]

4.7.2 IMPACT ANALYSIS

a) Would the project 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?

[5] (California Department of Conservation, 2023)
[6] Ibid.
[7] (California Department of Water Resources, 2022)

No Impact. The nearest major fault is the San Andreas Fault, located approximately 50 miles southwest of the Project site. The Project does not include any structures. The Project is for maintenance of rivers and streams for flood control purposes. There would be no impact.

The Project area is traditionally characterized by relatively low seismic activity. The site 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).

iii. Seismic-related ground failure, including liquefaction?

No Impact. Liquefaction occurs when loose, water-saturated sediments lose strength and fail during strong ground shaking. In general, liquefiable areas are generally confined to the Valley floor covered by Quaternary-age alluvial deposits, Holocene soil deposits, current river channels, and active wash deposits and their historic floodplains, marshes, and dry lakes. Specific liquefaction hazard areas in the county have not been identified. The Project involves routine river and stream maintenance activities. The Project does not propose the development of structures. Activities and staffing would be unchanged from existing conditions. There would be no impact.

iv. Landslides?

No Impact. As the Project is located on the Valley floor, no major geologic landforms exist in the area that could result in a landslide event. There would be no impact.

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

Less than Significant Impact. Maintenance 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. Furthermore, the Project is subject to additional provisions to prevent and control erosion as required by CDFW in the existing LSA Agreement. The Project involves continuing routine maintenance of rivers and streams for the purpose of flood control; these activities often involve erosion control work. The Project does not propose a change in the frequency or type of maintenance activities performed. Therefore, there would be no change in existing conditions. Any impact would be less than significant.

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?

d) Would the project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?

No Impact. The soil types within the District are loam, silty clay, fine sandy loam, clay loam, silt loam, and loamy sand (see Figure 4-3). Permeability is moderate. The Project will not contain any facilities that could

be affected by expansive soils, nor would substantial grading change the topography to the point where the Project would expose people to substantial risks to life or property. There would be no impact.

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?

No Impact. Septic installation or alternative wastewater disposal systems are not necessary for the Project. There would be no impact.

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

Less than Significant Impact. Paleontological resources are fossilized remains of flora and fauna and associated deposits. Most fossils are found in sedimentary rock. Sedimentary rock is formed by dirt (sand, silt, or clay) and debris that settles to the bottom of an ocean or lake and compresses for such a long time that it becomes hard as a rock. 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.

The Project could require grading and excavation activities. The Project would comply with California Public Resources Code Section 5097.5 which pertains to the protection of paleontological resources. With compliance with said regulation, impacts would be less than significant.

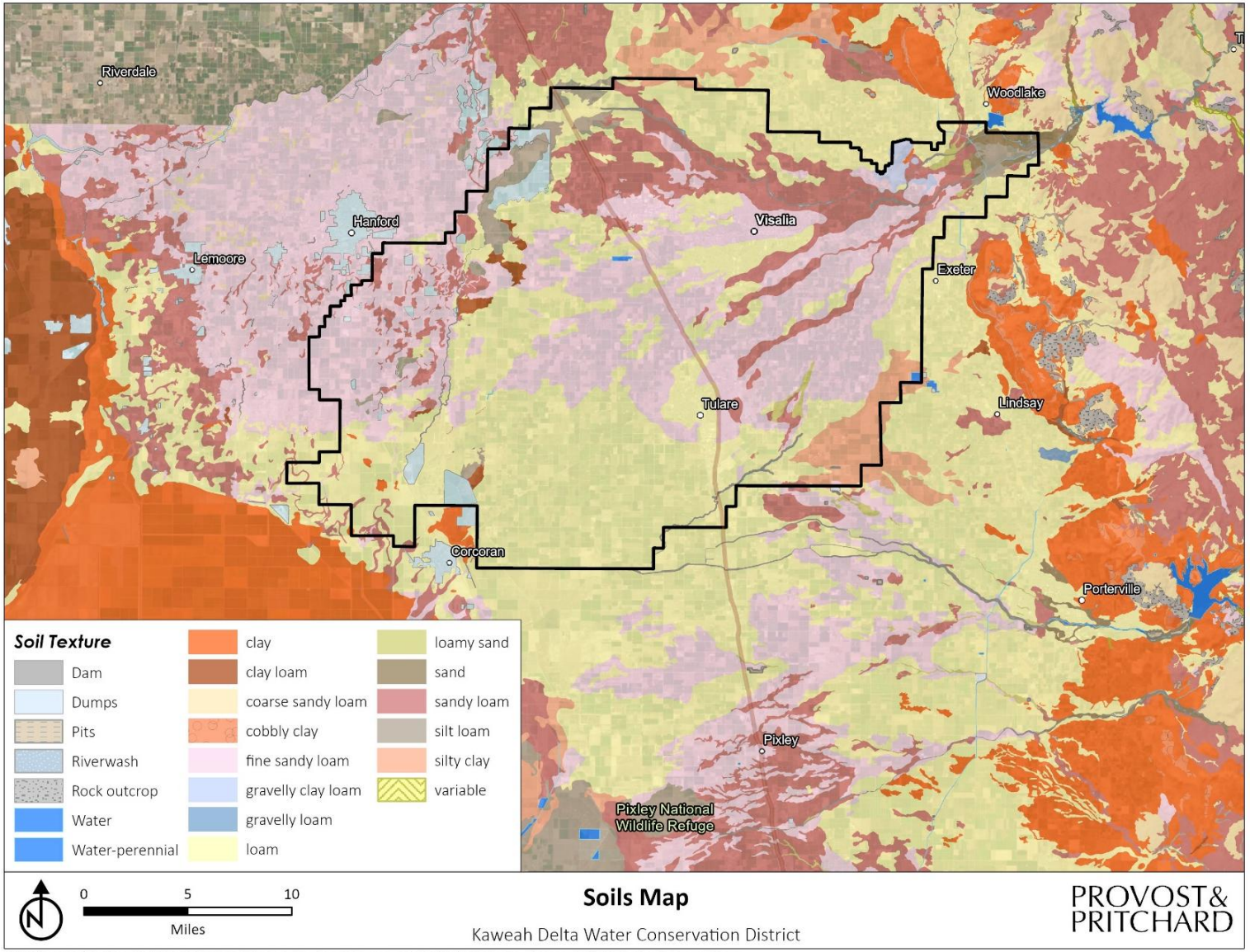

Figure 4-3: Soils Map

4.8 GREENHOUSE GAS EMISSIONS

Table 4-11: Greenhouse Gas Emissions Impacts

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?	☐	☐	☒	☐

4.8.1 BASELINE CONDITIONS

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 (GWP). 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 GWP 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.

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 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. In accordance with SJVAPCD's *CEQA Greenhouse Gas Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects*[8], 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.

4.8.2 IMPACT ANALYSIS

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

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

Less than Significant Impact. The nature of the Project is long-term routine maintenance of the Kaweah River system. The District has been performing maintenance activities within the Kaweah River system for over 50 years and proposes to continue this practice. No new construction activities are proposed,

[8] (San Joaquin Valley Air Pollution Control District, 2022)

and there is no proposed change in frequency of maintenance activities or an increase in trips. Project-related activities would be sporadic, short in duration, and unchanged from existing baseline conditions. Maintenance activities require the use of vehicles for purposes of transporting personnel and equipment to work sites. Project-related activities include use of fuel-powered equipment such as chainsaws, mowers, excavators, skidsteers, and loaders. Short-term vehicle and equipment emissions would be generated during maintenance activities; however, they would be minor and only utilized on an as-needed basis. As a standard practice, equipment is properly tuned and muffled, and unnecessary idling is minimized to reduce potential greenhouse gas emissions.

The activities covered by the Project do not conflict with any applicable greenhouse gas reduction plan, policy, or regulation. Furthermore, prolongation of the ongoing maintenance program would not create any new sources of GHG. Therefore, any impacts would be less than significant.

4.9 HAZARDS AND HAZARDOUS MATERIALS

Table 4-12: Hazards and Hazardous Materials Impacts

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?	☐	☐	☐	☒

4.9.1 BASELINE CONDITIONS

4.9.1.1 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 Section 65962.5 requires the California Environmental Protection Agency 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 sites, Department of Defense sites, and Land Disposal program. A search of the DTSC EnviroStor database and the SWRCB GeoTracker performed on January 20, 2025, determined that there are no known active hazardous waste generators or hazardous material spill sites within the Project site.[9]

4.9.1.2 AIRPORTS

Due to the relatively large scope of the Project, multiple airports are located within the Project area.

4.9.1.3 EMERGENCY RESPONSE PLAN

The Tulare County Office of Emergency Services (OES) coordinates the development and maintenance of the Tulare County Operational Area Master Emergency Services Plan. Tulare County offers an alert system called "AlertTC". AlertTC is Tulare County's public mass notification system, designed to keep those who live or work in Tulare County informed of important information during emergency events. The system is administered by the County of Tulare and is operated in partnership with many Tulare County cities.[10]

The Kings County OES is the County's emergency management agency, responsible for coordinating multi-agency responses to complex, large-scale emergencies and disasters within Kings County. It is the responsibility of the OES to develop and maintain the Emergency Operations Plan EOP, which serves as a guideline for who will do what, as well as when, with what resources, and by what authority--before, during, and immediately after an emergency.[11]

4.9.1.4 SENSITIVE RECEPTORS

Due to the relatively large Project APE, various sensitive receptors are located within the Project area.

4.9.2 IMPACT ANALYSIS

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

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?

No Impact. There are no designated hazardous materials transportation routes in the vicinity of the Project area. Additionally, there would be no transport, use, or disposal of hazardous materials associated with the maintenance, with the exception of diesel fuel for equipment. Therefore, there would be no impact.

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?

Less than Significant Impact. The Project would not emit hazardous emissions or involve the transport or handling of any hazardous materials. The use and application of herbicides would be applied consistently with manufacturer labels. Herbicides could include Roundup for dry land sites and AquaMaster for water

[9] (State Water Resources Control Board, 2024); (Department of Toxic Substances Control, 2024)
[10] (Tulare County, 2025)
[11] (County of Kings , 2025)

sites. Legal mandates and standard best management practices (BMPs) would be used in the application of herbicides. Impacts would be less than significant.

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?

No Impact. The Project does not involve land that is actively listed as a hazardous materials site pursuant to Government Code Section 65962.5 and is not included on a list compiled by DTSC or the SWRCB. There would be no impact.

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?

No Impact. The maintenance activities would not be a safety hazard for people working in the area. There would be no impact.

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

No Impact. The Project would not include any physical barriers or disturb any roadways in such a way that would impede emergency or hazards response; therefore, the Project would not interfere with implementation of an emergency response plan or evacuation plan. There would be no impact.

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

No Impact. 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. Therefore, there would be no impacts related to exposure from wildland fires.

4.10 HYDROLOGY AND WATER QUALITY

Table 4-13: Hydrology and Water Quality Impacts

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 off-site;	☐	☐	☒	☐
iii. create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☒	☐
iv. impede or redirect flood flows?	☐	☐	☒	☐
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☒	☐
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐

4.10.1 BASELINE CONDITIONS

Water resources in Tulare and Kings Counties include many natural rivers and streams, man-made surface water conveyance structures, and groundwater. Groundwater and surface water management is accomplished through various combinations of public and private water entities, including the U.S. Bureau of Reclamation, water utility companies, and local irrigation districts, all of which are governed by state and federal regulations.

4.10.2 IMPACT ANALYSIS

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

Less than Significant Impact. SWRCB requires that a SWPPP be prepared for projects that disturb one (1) acre or more of soil. A SWPPP involves site planning and scheduling, limiting disturbed soil areas, and determining BMPs to minimize the risk of pollution and sediments being discharged from construction sites. Furthermore, the Project is subject to additional provisions to prevent pollution and/or degradation of water quality as required by CDFW in the existing LSA Agreement. The Project involves continuing routine maintenance of rivers and streams for the purpose of flood control. The Project does not propose a change in the frequency or type of maintenance activities performed. Therefore, there would be no change in existing conditions. Any impact would be less than significant.

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

No Impact. Implementation of the Project would not result in the depletion of groundwater supplies. There would be no impact.

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 off-site;

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

iv. impede or redirect flood flows?

Less than Significant Impact. The Project would improve stream and river channels for flood control purposes. The Project would not substantially alter the course of the flow of a stream or river in which substantial erosion or siltation could occur, nor would it impede or redirect flood flows. The existing and proposed LSA Agreement contains several provisions to prevent alteration of the existing drainage pattern and to reduce erosion and siltation. The Project would continue to implement these protective measures. This Project does not involve the introduction of impermeable surfaces that could potentially alter draining patterns. Therefore, impacts would be less than significant.

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

Less than Significant Impact. Much of the Project area lies within the Terminus Dam (Lake Kaweah) inundation zone; however, the Project does not include any structures, and the extraordinarily-low likelihood of dam failure minimizes the potential for loss, injury, or death. Furthermore, the Project involves maintenance activities and would not require permanent staffing. Activities and staffing would

be unchanged from existing conditions. There are no nearby bodies of water of sufficient size or shape to generate a standing wave resulting in seiche and the Project site's distance from the Pacific Ocean and the intervening Coast Ranges preclude occurrence of a tsunami. The site's flat topography and its distance from flood-prone bodies of water make inundation by mudflow an unlikely occurrence. No structures housing people are associated with the Project. Therefore, any impacts would be less than significant.

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

Less than Significant Impact. As identified earlier, the Project may be required to prepare a SWPPP. A SWPPP involves site planning and scheduling, limiting disturbed soil areas, and determining BMPs to minimize the risk of pollution and sediments being discharged from construction sites. Furthermore, the Project is subject to additional provisions to prevent pollution and/or degradation of water quality as required by CDFW in the existing and proposed LSA Agreement. The Project would not conflict with any applicable sustainable groundwater management plan as the Project would not deplete groundwater resources and would not result in a significant impact to water quality. Overall, impacts would be less than significant.

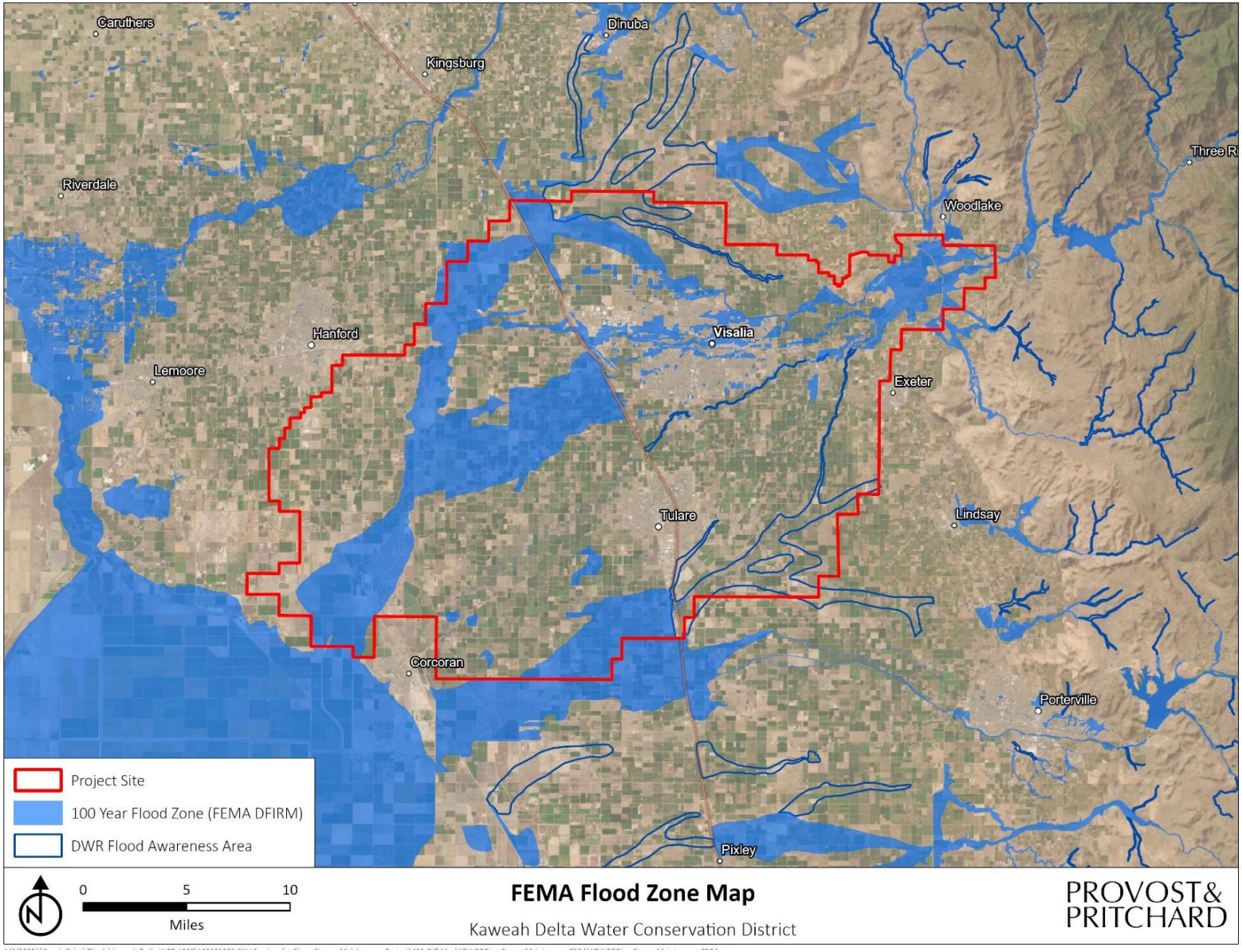

Figure 4-4: FEMA Flood Map

4.11 LAND USE AND PLANNING

Table 4-14: Land Use and Planning Impacts

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?	☐	☐	☐	☒

4.11.1 BASELINE CONDITIONS

The Project area is located in Tulare County and Kings County. The cities and communities of Woodlake, Ivanhoe, Farmersville, Exeter, Visalia, Tulare, Hanford and Goshen are in the vicinity of the Project. The District is located on the Valley floor east of the Coast Ranges and west of the Sierra Nevada Mountain Range. The Project area is at an average elevation of 297 feet above mean sea level. No forest or timber land is present within the Project area or in the Project vicinity.

4.11.2 IMPACT ANALYSIS

a) Would the project physically divide an established community?

No Impact. The Project involves continuing routine maintenance of rivers and streams for flood control. The Project would not physically divide any established community. There would be no impact.

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?

No Impact. The Project would not conflict with any applicable plans, policies, or regulations. The Project would comply with all applicable regulatory compliance measures. There would be no impact.

4.12 MINERAL RESOURCES

Table 4-15: Mineral Resources Impacts

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?	☐	☐	☐	☒

4.12.1 BASELINE CONDITIONS

The bulk of mineral extraction activities focus on aggregate (sand, gravel, and crushed stone), which is primarily used in building materials. Historically, the Kaweah River, Lewis Creek, and the Tule River have provided the main sources of high-quality sand and gravel in the area. The highest-quality deposits are located at the Kaweah and Tule Rivers.

According to the California Division of Oil, Gas, and Geothermal Resources, there are no records of active oil or gas wells in the Project area. Furthermore, there are no known mineral resources in the Project area.

4.12.2 IMPACT ANALYSIS

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?

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?

No Impact. As mentioned above, there are no known active oil or gas wells in the Project area, nor are there any known mineral resources in the Project area. River and stream maintenance would not result in the loss of availability of known mineral resources since no known mineral resources occur in the Project area. There would be no impact.

4.13 NOISE

Table 4-16: Noise Impacts

Would the project result in:	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 ground borne vibration or ground borne 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?	☐	☐	☐	☒

4.13.1 BASELINE CONDITIONS

The Project area is situated within a region dominated by agricultural uses. The Project area is located in Tulare County and Kings County. The cities and communities of Woodlake, Ivanhoe, Farmersville, Exeter, Visalia, Tulare, Hanford and Goshen are in the vicinity of the Project.

4.13.2 IMPACT ANALYSIS

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?

No Impact. Maintenance activities to river and stream channels in the District would not generate significant noise. Any impacts would be mild and temporary.

b) Would the project result in generation of excessive ground borne vibration or ground borne noise levels?

No Impact. The Project does not involve construction or substantial alterations of any structures. The Project would not expose persons or generate excessive vibration or noise levels. There would be no impact.

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

No Impact. The Project would not expose people to excessive noise levels. Therefore, there would be no impact.

4.14 POPULATION AND HOUSING

Table 4-17: Population and Housing Impacts

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?	☐	☐	☐	☒

4.14.1 BASELINE CONDITIONS

The Project area is situated within a region dominated by agricultural uses. The Project area is located in Tulare County and Kings County. The cities and communities of Woodlake, Ivanhoe, Farmersville, Exeter, Visalia, Tulare, Hanford and Goshen are in the vicinity of the Project.

4.14.2 IMPACT ANALYSIS

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

No Impact. The Project would involve river and stream maintenance. The Project would not encourage population growth directly or indirectly. No residential structures would be built, nor will any be removed. The Project would not displace anyone. Therefore, there would be no impact.

4.15 PUBLIC SERVICES

Table 4-18: Public Services

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

4.15.1 BASELINE CONDITIONS

Tulare and Kings County have access to adequate public services. The cities and communities of Woodlake, Ivanhoe, Farmersville, Exeter, Visalia, Tulare Hanford and Goshen are in the vicinity of the Project.

4.15.2 IMPACT ANALYSIS

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

i. Fire Protection:

ii. Police Protection:

iii. Schools:

iv. Parks:

v. Other public facilities:

No Impact. There is no nexus between the Project and public services. The Project, which involves river and stream maintenance activities, does not include development, construction, or population growth. The Project would not require the addition or alteration of any public services. There would be no impact to fire protection, police protection, schools, parks, or other public facilities.

4.16 RECREATION

Table 4-19: Recreation Impacts

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) 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?	☐	☐	☐	☒

4.16.1 BASELINE CONDITIONS

The Project is located in within the Kaweah River system within District's boundary and immediate SOI, an area of approximately 340,000 acres. The Project encompasses approximately 209 miles of rivers, streams, creek and sloughs that are tributaries or distributaries to the Kaweah River lying within both Tulare and Kings Counties.

4.16.2 IMPACT ANALYSIS

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?

No Impact. The Project involves river/stream maintenance for flood control along the Kaweah River system. It would not increase the demand for recreational facilities or put a strain on the existing recreational facilities. No population growth would be associated with the Project or be necessitated by the Project. There would be no impact.

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?

No Impact. The Project does not include recreational facilities. As there is no population growth associated with the Project, construction or expansion of nearby recreational facilities would not be necessary. There would be no impact.

4.17 TRANSPORTATION

Table 4-20: Transportation Impacts

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

4.17.1 BASELINE CONDITIONS

The Project area is situated within a region dominated by agricultural uses. The Project area is located in Tulare County and Kings Counties. The cities and communities of Woodlake, Ivanhoe, Farmersville, Exeter, Visalia, Tulare Hanford and Goshen are in the vicinity of the project. Roadways, which include all classifications of roadways, are adequate in the Project area.

4.17.2 IMPACT ANALYSIS

a) Would the project conflict with a 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)?

No Impact. The Project would consist of river and stream maintenance. Maintenance traffic associated with the Project would be minimal and would be no different than existing conditions. There would be no impact to existing roadways in the area and the Project would not conflict or be inconsistent with CEQA Guidelines section 15064.3 subdivision (b).

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)?

No Impact. No new roadway design features are associated with the Project. Therefore, there would be no impact.

d) Would the project result in inadequate emergency access?

No Impact. No roads would be modified as a result of the Project; therefore, there would be no impact to any emergency access on local roadways.

4.18 TRIBAL CULTURAL RESOURCES

Table 4-21: Tribal Cultural Resources Impacts

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 the local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☐	☒	☐	☐
ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☒	☐	☐

4.18.1 BASELINE CONDITIONS

The Project lies within the homeland of the Southern Valley Yokuts. At the time of first contact with the Spanish missionaries, the Yokut people, which also includes Northern Valley and Foothill groups, collectively inhabited the San Joaquin Valley as well as the eastern foothills of the Sierra Nevada from the Fresno River southward to the Kern River.

The serial incursion of Spanish, Mexican, and finally northern European settlers irrevocably changed the lifeways of the Yokuts and ultimately led to the complete displacement of native peoples from the valley. With the founding of Mission San Juan Bautista in 1797, Indians inhabiting the western portion of the San Joaquin Valley were forcibly recruited to serve at the mission. It appears that natives were replaced by Spanish settlers.

4.18.1.1 RECORDS SEARCH

On January 20, 2025, a cultural resource records search was requested from the SSJVIC of the CHRIS at California State University in Bakersfield, California. The purpose of this request was to identify and review prior cultural resource studies and previously recorded cultural resources on or near the APE. The records search included prior cultural resources investigation reports conducted, previously recorded resources

within the APE and the 1.0- mile radius around the APE. Also included in research were cultural resource records as well as the Historic Properties Directory of the Office of Historic Preservation list, General Land Office Maps, Archaeological Determinations of Eligibility list, and the California Inventory of Historic Resources list. On February 3, 2025, the SSJVIC provided the results of the CHRIS cultural records search. The search confirmed there have been 448 previous cultural resource studies conducted within the Project APE. The search also identified 781 cultural resources and 20 known but unrecorded resources within the Project APE. There are 31 recorded resources within the Project APE that are listed in the NRHP. There are 40 recorded resources within the Project APE listed in the California Register of Historical Resources. Additionally, there are three California State Historic Landmark resources within the Project APE.

4.18.1.2 NATIVE AMERICAN OUTREACH

A SLF search was requested from the NAHC on January 20, 2025. The NAHC responded on January 22, 2025, via letter regarding the request. The SLF search did identify positive results of cultural resources in the Project APE. The NAHC also supplied a list of Native American representatives to contact for information or knowledge of cultural resources in the APE and the surrounding area. The following Native American organizations/individuals were contacted from the list provided by NAHC below:

1. Chairperson Delia Dominguez of Kitanemuk and Yowlumne Tejon Indians
2. Tribal Historic Preservation Officer Shana Powers of the Santa Rosa Rancheria Tachi Tribe
3. Cultural Specialist II Samantha McCarty of the Santa Rosa Rancheria Tachi Yokut Tribe
4. Cultural Specialist I Nichole Escalon of the Santa Rosa Rancheria Tachi Yokut Tribe
5. Cultural Resource Director Bob Pennell of Table Mountain Rancheria
6. Chairperson Michelle Heredia-Cordova of Table Mountain Rancheria
7. Chairperson Neil Peyron of the Tule River Indian Tribe
8. Environmental Department Director Kerri Vera of the Tule River Tribe
9. Tribal Archaeologist of the Tule River Indian Tribe
10. Chairperson Kenneth Woodrow of the Wuksache Indian Tribe/Eshom Valley Band
11. Chairperson David Alvarez of Traditional Choinumni Tribe

Each individual on the contact list was contacted on January 28, 2025. The letters included a description of the Project and a topographic map of the location.. Environmental Department Director Kerri Vera of the Tule River Tribe acknowledged that the letter was received but did not request further information or consultation. As of the date of this report, two responses were received by the Native American representatives. On January 30, 2025, David Alvarez, Tribal Chairman for the Traditional Choinumni Tribe responded by stating that the Project is out of their historical land use and would be unable to comment. On February 12, 2025, Samantha McCarty, Cultural Specialist II with the Santa Rosa Rancheria Tachi Yokut Tribe requested to schedule a meeting with the District and P&P staff to discuss the Project in more detail. On March 3, 2025, a meeting was held to discuss the Project in more detail. Participants included one member of the Santa Rosa Rancheria Tachi Yokut Tribe, one member of the District, and three staff members of P&P. During this meeting, the Santa Rosa Rancheria Tachi Yokut Tribe addressed their concerns regarding potential project disturbance to places of spiritual, sacred activity or traditional use or other resources of importance. Due to the large Project APE and the fact that no cultural resources have been identified during prior and existing maintenance activities, the District will implement appropriate measures to satisfy and protect cultural and tribal cultural resources. The District will include standard mitigation measures, as seen in more detail below. Said mitigation measures are required under State law to protect cultural and tribal cultural resources.

4.18.1.3 ASSEMBLY BILL 52

PRC Section 21080.3.1, et seq. (codification of AB 52, 2013-14) requires that a lead agency, within 14 days of determining that it would 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 would be made. As of the date of this report, the District has not received any written correspondence from a Tribe pursuant to Public Resources Code Section 21080.3.1 requesting notification of a proposed project.

4.18.2 IMPACT ASESSMENT

a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

vi. Listed or eligible for listing in the California Register of Historical Resources, or in the local

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

Less than Significant Impact with Mitigation Incorporated. The CHRIS results determined that there were 781 cultural resources and 20 known but unrecorded resources within the Project APE. Furthermore, the NAHC SLF records search were positive. The high number of resources and positive results is due to the fact that the Project APE covers as much land as it does. While the Project APE covers so much land, the actual maintenance activities would only take place within the channels of Kaweah Basin waterways, which does not account for the majority of land in the Project APE. However, indigenous populations are known to have inhabited along natural waterways such as rivers and streams as they were a source for food, water, and other resources. Thus, there is a possibility of encountering buried cultural resources during Project activities. Therefore, mitigation measures CUL-1 and CUL-2, as outlined in Section 4.5.3 will be implemented in order to reduce impacts to less than significant.

4.18.3 MITIGATION

See CUL-1 and CUL-2 in Section 4.5.3.

4.19 UTILITIES AND SERVICE SYSTEMS

Table 4-22: Utilities and Service Systems Impacts

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 reduction goals?	☐	☐	☐	☒
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☐	☒

4.19.1 BASELINE CONDITIONS

According to the USGS classification system, the Project is located within the Tulare-Buena Vista Lakes watershed; Hydrologic Unit Code (HUC): 18030012.[12] This watershed is broadly defined as "the drainage into the Tulare and Buena Vista Lake closed basins.[13]" The Project lies entirely within the San Joaquin Valley Groundwater Basin. The majority of Project area is located within the Kaweah Groundwater Subbasin; however, portions of the Tulare Lake Groundwater Subbasin and Kings Subbasin intersect the District.[14]

Declines in groundwater basin storage and groundwater overdraft are recurring problems in Tulare and Kings County. Measures for ensuring the continued availability of groundwater for municipal needs have been identified and planned in several areas. The measures include groundwater conservation and recharge, and supplementing or replacing groundwater sources for irrigation with surface water.

[12] (United States Geological Survey, 2025)
[13] Ibid.
[14] (State of California Department of Water Resources, 2020)

4.19.2 IMPACT ANALYSIS

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?

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

c) Would the project 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?

No Impact. The Project would not exceed wastewater treatment requirements or require new facilities. The Project entails the maintenance of existing streams and rivers within the Kaweah River System. The Project would not generate the need for expanded wastewater treatment facilities or have an adverse environmental effect to wastewater treatment in the area. There would be no impact related to insufficient water supplies. The Project would not require or result in the construction of new storm water drainage facilities or expansion of existing facilities. The Project will create no demand on any wastewater treatment provider, nor would it require any wastewater treatment facilities at the Project site, so there would be no need for any sort of capacity determination by a wastewater treatment provider. Therefore, there would be no impact.

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?

No Impact. The Project would not generate solid waste as it is a flood control maintenance project. There would be no impact.

e) Would the project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

No Impact. The Project would continue to comply with any federal, State, and local regulations regarding solid waste. There would be no impact.

4.20 WILDFIRE

Table 4-23: Wildfire Impacts

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?	☐	☐	☒	☐

4.20.1 BASELINE CONDITIONS

The Project area is situated within a region dominated by agricultural uses. The Project area is located in Tulare County and Kings County. The cities and communities of Woodlake, Ivanhoe, Farmersville, Exeter, Visalia, Tulare, Hanford and Goshen are in the vicinity of the Project. The Project area contains lands identified as State Responsibility Areas (SRAs) and lands that are located in a Very High Fire Hazard Severity Zone.[15]

4.20.2 IMPACT ANALYSIS

a) If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project substantially impair an adopted emergency response plan or emergency evacuation plan?

b) If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project due to slope, prevailing winds, and other factors, exacerbate wildfire risks and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

c) If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project require the installation or maintenance of associated infrastructure (such as roads,

[15] (Cal Fire, 2024); (California Department of Forestry and Fire Protection, 2023)

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) If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project 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?

Less than Significant Impact. Due to the Project's large scope of land that it covers, there are various lands designated as a very high fire hazard severity zone. In addition, some of the lands in the Project area are categorized as an SRA, which means CalFire is the fire protection provider to that area. The Project's purpose is to provide routine channel maintenance within the Kaweah River system in Tulare and Kings Counties. The purpose of the channel maintenance is to support optimal flood control. Living and dead vegetation, accumulations of sand and sediment, and debris would be removed from within the channel and along each bank. Over-hanging limbs, invasive vegetation, hazardous or dead trees, and other debris would be removed. An incidental benefit of the Project is that maintaining the vegetation in and around the river channels reduces the amount of flammable organic material in the area. Furthermore, during construction, BMPs would be implemented such as debris control which would require the construction crew to regularly collect and dispose of construction debris, including the wood scraps and vegetation that is being cleared. Additionally, debris control measures includes proper storing and disposing of flammable materials. With the inclusion of the aforementioned BMPs, impacts would be less than significant.

4.21 CEQA MANDATORY FINDINGS OF SIGNIFICANCE

Table 4-24: CEQA Mandatory Findings of Significance

Does the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) 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) 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) Have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

4.21.1 STATEMENT OF FINDINGS

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?

Less than Significant Impact with Mitigation Incorporated. The analysis conducted in this document determined 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 and cultural resources from the implementation of the Project will be less than significant with the incorporation of the mitigation measures discussed in Chapter 5 Mitigation, Monitoring, and Reporting Program. Accordingly, the Project would 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.

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)?

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 the cumulative effects of a project must, therefore, be conducted in connection with the effects of past projects, other current projects, and probable future projects. The Project involves river/stream maintenance for flood control along the Kaweah River system. No additional roads would be constructed as a result of the Project, nor would any additional public services be required. 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 the Project.

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

Less than Significant Impact. The Project would include river/stream maintenance for flood control along the Kaweah River system. The Project in and of itself would not create a significant hazard to the public or the environment. There would not be any construction-related air quality/dust exposure impacts as a part of the Project. Additionally, implementation of basic regulatory requirements identified in this IS/MND would ensure that any Project impacts are less than significant. Therefore, the Project would not have any direct or indirect adverse impacts on humans. This impact would be less than significant

CHAPTER 5 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 Project in the Tulare and Kings Counties. The MMRP lists mitigation measures recommended in the IS/MND for the Project and identifies monitoring and reporting requirements.

Table 5-1: Mitigation, Monitoring, and Reporting Program presents the mitigation measures identified for the 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 5-1: Mitigation, Monitoring, and Reporting Program 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 Lead and Responsible Agencies to ensure that individual mitigation measures have been complied with and monitored

Table 5-1: Mitigation, Monitoring, and Reporting Program

Mitigation, Monitoring, and Reporting Program						
Item	Mitigation Measure	When Monitoring is to Occur	Frequency of Monitoring	Agency Responsible for Monitoring	Method to Verify Compliance	Verification of Compliance
Biological Resources						
General Project-Related Impacts						
BIO-1	(WEAP Training): Prior to initiating construction activities (including staging and mobilization), all personnel associated with project construction will attend a 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 work area. The specifics of this program will 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. This training will discuss special status species, describe the laws and regulations in place to provide protection of these species, identify the penalties for violation of applicable environmental laws and regulations, and include a list of required protective measures to avoid "take." A fact sheet summarizing this information, along with photographs or illustrations of sensitive species with potential to occur on the site, will also be prepared for distribution to all contractors, their employees, and all other personnel involved with construction of the project. All trainees will sign a form documenting that they have attended WEAP training and understand the information presented to them.	Prior to the start of any construction activities	As needed for any new construction personnel during construction activities	Kaweah Delta Water Conservation District (KDWCD) with assistance of a qualified biological subconsultant	Report	
BIO-2	(Operational Hours): Construction activities will be limited to a half hour after sunrise through a half hour before sunset, when possible, to reduce potential impacts to wildlife movement corridors.	During construction activities	During Construction	KDWCD	Report	
BIO-3	(Access Routes): In order to reduce disturbance to wildlife species and habitat occurring adjacent to	During construction activities	During Construction	KDWCD	Report	

Mitigation, Monitoring, and Reporting Program						
Item	Mitigation Measure	When Monitoring is to Occur	Frequency of Monitoring	Agency Responsible for Monitoring	Method to Verify Compliance	Verification of Compliance
	work areas, equipment access into work areas will be limited to ingress/egress corridors from existing roads. If new access through streams or wetlands is necessary, the vehicle route will be constructed in an appropriate location chosen by a qualified biologist based on minimal disturbance to the riparian corridor.					
BIO-4	(Avoid Removal of Native Trees): Maintenance projects will minimize the trimming or removal of living native trees (DBH 4" or greater) within the upper half of Type 1 channels. The trimming or removal will be based upon one or more of the following criteria: a) Be in clear danger of falling into the channel; b) Significantly reduce channel capacity; c) Would result in accelerated erosion; and d) Obstruct or impede access routes.	During construction activities	During Construction	KDWCD	Report	
BIO-5	(Daily Inspection of Site and Equipment): The construction crew will inspect the work area each day prior to the start of work. If any special status species are observed, they will be avoided and allowed to passively leave the site prior to the initiation of construction. Construction crews will inspect areas beneath equipment at the beginning and end of each workday to prevent mortality or injury to special status species by vehicle strike. Furthermore, equipment will be inspected for leaks prior to the start of work each day to prevent contamination of water within the channel.	During construction activities	During Construction	KDWCD	Report	
BIO-6	(Avoid Impacts to Active Channel): When feasible, maintenance projects involving the removal of sand or operation of heavy equipment within the streambed will occur when the channel is dry.	During construction activities	During Construction	KDWCD	Report	
BIO-7	(General Pre-Construction Surveys and Avoidance Buffers): Pre-construction surveys for special status plants, animals, and Natural Communities of Special Concern will be conducted by a qualified biologist	Within 30 days prior to the beginning of construction activities.	Once	KDWCD with assistance of a qualified biological subconsultant	Report	

Mitigation, Monitoring, and Reporting Program						
Item	Mitigation Measure	When Monitoring is to Occur	Frequency of Monitoring	Agency Responsible for Monitoring	Method to Verify Compliance	Verification of Compliance
	within 30 days prior to the beginning of construction activities. Pre-construction surveys within Natural Communities of Special Concern will include photographs documenting existing site conditions. If sensitive biological resources are present onsite, the biologist will establish an appropriate avoidance buffer zone and label sensitive resources or areas of avoidance with flagging, fencing, or other easily visible means.					
BIO-8	(Post-Construction Survey and Photographs): For all construction activities within Natural Communities of Special Concern, a qualified biologist will perform a post-construction survey within 30 days of completion and capture representative pictures of the work areas. Pre- and post-construction photographs documenting site conditions will be compiled and sent to CDFW for review yearly. If unforeseen impacts have occurred within Natural Communities of Special Concern, CDFW will be consulted immediately.	Within 30 days post construction	Once	KDWCD with assistance of a qualified biological subconsultant	Report	
BIO-9	(Avoidance of Special Status Species): If a special status animal is observed onsite, they will be avoided and allowed to passively leave the site prior to the start of construction activities. On discovery of active nests, dens, burrows, roosts of a special status or otherwise protected species (i.e., migratory bird, USFWS- or CDFW-listed species, California special status species, or rare plant) near work areas, the biologist will determine avoidance buffers based on applicable CDFW guidelines and/or the biology of the species in question. Avoidance buffers will be identified with flagging, fencing, or other easily visible means. If an active nest, den, burrow, or roost of a special status or otherwise protected species is present within the work area and avoidance is not feasible, CDFW and/or USFWS	During construction activities	During Construction	KDWCD	Report	

Mitigation, Monitoring, and Reporting Program						
Item	Mitigation Measure	When Monitoring is to Occur	Frequency of Monitoring	Agency Responsible for Monitoring	Method to Verify Compliance	Verification of Compliance
	will be consulted to determine the best course of action.					
BIO-10	(BMPs): The project proponent will require that all workers employ the following best management practices (BMPs) in order to avoid and minimize potential impacts to special status species: • Vehicles will observe a 15-mph speed limit while on unpaved access routes. • The presence of any special status species will be reported to the project's qualified biologist, who will submit the occurrence to the CNDDB. If necessary, the biologist will report the occurrence to CDFW and/or USFWS.	Prior to the start of any construction activities	During Construction	KDWCD	Report	
Project-Related Impacts to Special Status Plant Species						
BIO-11	(Focused Survey): Since this species is perennial and can be identified throughout the year a qualified botanist/biologist (someone able to identify Sanford's arrowhead) will conduct focused botanical surveys prior to the start of construction if suitable habitat for Sanford's arrowhead occurs within the work area according to CDFW's Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities (2018) for areas where ground disturbance will occur.	September 16 to January 31	Once, as determined by qualified biologist during construction activities	KDWCD with assistance of a qualified biological subconsultant	Report	
BIO-12	(Avoidance): If any special status plants are identified during a survey an avoidance buffer and exclusion fencing, if necessary, will be placed around the area to avoid the plants and their root system.	Prior to the start of construction activities	Once, as determined by qualified biologist prior to construction activities	KDWCD with assistance of a qualified biological subconsultant	Report	
BIO-13	(Formal Consultation): If rare plant individuals or populations are detected within project work areas during the focused botanical surveys, and the plants cannot be avoided, the project proponent will	Prior to the start of construction activities	Once, Prior to ground disturbing activities and the start of construction	KDWCD with assistance of a qualified biological subconsultant	Report	

Mitigation, Monitoring, and Reporting Program						
Item	Mitigation Measure	When Monitoring is to Occur	Frequency of Monitoring	Agency Responsible for Monitoring	Method to Verify Compliance	Verification of Compliance
	initiate consultation with CNPS to determine next steps for relocation.					
Project-Related Mortality and/or Nest Abandonment of Migratory Birds, Raptors, and Special Status Birds, Including Loggerhead Shrike, Swainson's Hawk, and Tricolored Blackbird						
BIO-14	(Avoidance): The project's construction activities will occur, if feasible, between September 16 and January 31 (outside of the nesting bird season) to avoid impacts to nesting birds.	September 16 to January 31	Once, as determined by qualified biologist during construction activities	KDWCD with assistance of a qualified biological subconsultant	Report	
BIO-15	(Pre-construction Surveys): If activities must occur within the nesting bird season (February 1 to September 15), a qualified biologist will conduct a single take avoidance survey for Swainson's hawk nests onsite and within a 0.5-mile radius within seven calendar days prior to the start of construction. This survey will be conducted in accordance with the Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley (Swainson's Hawk Technical Advisory Committee, 2000), or current guidance. The Swainson's hawk survey will not be completed between April 21 to June 10 due to the difficulty of identifying nests during this time of year. A qualified biologist will conduct a single take avoidance survey for tricolored blackbird nests onsite and within a 300-foot radius within seven calendar days prior to the start of construction. This survey will be conducted in accordance with CDFWs Staff Guidance Regarding Avoidance of Impacts to Tricolored Blackbird Breeding Colonies on Agricultural Fields (California Department of Fish and Wildlife, 2015), or current guidance. The surveys would also include inspecting for nesting migratory birds within and up to 100 feet outside of the site and for loggerhead shrike and other nesting raptors within and up to 500 feet outside of the site.	Prior to the start of construction activities	Once, as determined by qualified biologist prior to construction activities	KDWCD with assistance of a qualified biological subconsultant	Report	

Mitigation, Monitoring, and Reporting Program						
Item	Mitigation Measure	When Monitoring is to Occur	Frequency of Monitoring	Agency Responsible for Monitoring	Method to Verify Compliance	Verification of Compliance
	All raptor nests would be considered "active" upon the nest-building stage. If no active nests are observed, no further mitigation is required.					
BIO-16	(Avoidance Buffers): On discovery of any active nests or breeding colonies near work areas, a qualified biologist will determine appropriate avoidance buffer distances based on applicable CDFW and/or USFWS guidelines, the biology of the species, conditions of the nest(s), and the level of project disturbance. If necessary, avoidance buffers will be identified with flagging, fencing, or other easily visible means, and will be maintained until the biologist has determined that the nestlings have fledged.	Prior to the start of construction activities	Once, as determined by qualified biologist prior to construction activities	KDWCD with assistance of a qualified biological subconsultant	Report	
Project-Related Mortality and/or Disturbance to Burrowing Owl						
BIO-17	(Pre-construction Take Avoidance Survey): A qualified biologist (someone familiar with the identification and sign of this species) will conduct a pre-construction take avoidance survey for BUOW and suitable burrows, in accordance with CDFW's Staff Report on Burrowing Owl Mitigation (2012), within seven (7) days prior to the start of construction activities if suitable habitat or burrows are observed during the general pre-construction survey (BIO-7). The survey shall include the proposed work area and surrounding lands up to 500 feet. If no BUOW individuals or active burrows are observed, no further mitigation is required.	Within seven days prior to the start of construction	Once, as determined by qualified biologist prior to construction activities	KDWCD with assistance of a qualified biological subconsultant	Report	
BIO-18	(Avoidance): If an active BUOW burrow is detected, avoidance buffers will be implemented. A qualified biologist will determine appropriate avoidance buffer distances based on CDFW's 2012 Staff Report on Burrowing Owl Mitigation, the biology of BUOW, conditions of the burrow(s), and the level of project disturbance, which can be found in the table below. If necessary, avoidance buffers will be identified with flagging, fencing, visual screens, or other easily	Upon discovery of an active BUOW burrow	During construction	KDWCD with assistance of a qualified biological subconsultant	Report	

<table>
<tr><th colspan="7">Mitigation, Monitoring, and Reporting Program</th></tr>
<tr><th>Item</th><th>Mitigation Measure</th><th>When Monitoring is to Occur</th><th>Frequency of Monitoring</th><th>Agency Responsible for Monitoring</th><th>Method to Verify Compliance</th><th>Verification of Compliance</th></tr>
<tr><td></td><td>visible means, and will be maintained until the biologist has determined that nestlings have fledged and all BUOW have left the site.

<table>
<tr><td colspan="5">Level of Disturbance</td></tr>
<tr><td>Location</td><td>Time of Year</td><td>Low</td><td>Med</td><td>High</td></tr>
<tr><td>Nesting sites</td><td>April 1-Aug 15</td><td>200 meters</td><td>500 meters</td><td>500 meters</td></tr>
<tr><td>Nesting sites</td><td>Aug 16-Oct 15</td><td>200 meters</td><td>200 meters</td><td>500 meters</td></tr>
<tr><td>Nesting sites</td><td>Oct 16-Mar 31</td><td>50 meters</td><td>100 meters</td><td>500 meters</td></tr>
</table></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>BIO-19</td><td>(ITP and Passive Relocation): If an active BUOW burrow is detected within the proposed work area and cannot be avoided, it is recommended the project obtain an Incidental Take Permit (ITP) in order to implement a passive relocation plan and protect the project from “take” of this species.</td><td>Upon discovery of an active BUOW burrow</td><td>During construction</td><td>KDWCD with assistance of a qualified biological subconsultant</td><td>Report</td><td></td></tr>
<tr><td colspan="7">Project-Related Mortality and/or Disturbance to Crotch’s Bumble Bee</td></tr>
<tr><td>BIO-20</td><td>(Flying Bumble Bee and Nest Surveys): If suitable nesting or overwintering habitat (i.e. burrows, old bird nests, rock piles, cavities in dead trees, or significant leaf litter) is observed within the work area during the general pre-construction surveys, a qualified biologist (someone who is familiar with and can identify bumble bees) will conduct three flying bumble bee and nest surveys during the peak flying periods (April, May to June, and July) prior to initial ground disturbing activities. The biologist will walk throughout the site and up to 100 feet outside of the site during the optimal time of the day to inspect for bumble bees and any nests. If an individual is observed, it will be followed until it can be determined if a nest is present within the survey boundary. If no nests are observed, no further mitigation is required.</td><td>Prior to construction activities</td><td>Once, as determined by qualified biologist during construction activities</td><td>KDWCD with assistance of a qualified biological subconsultant</td><td>Report</td><td></td></tr>
<tr><td>BIO-21</td><td>(Identification and Protection Plan): Bumble bee individuals need to be captured to be identified. If a</td><td>Upon discovery of a bumble bee nest</td><td>Once, as determined by</td><td>KDWCD with assistance of a</td><td>Report</td><td></td></tr>
</table>

Mitigation, Monitoring, and Reporting Program						
Item	Mitigation Measure	When Monitoring is to Occur	Frequency of Monitoring	Agency Responsible for Monitoring	Method to Verify Compliance	Verification of Compliance
	bumble bee nest is observed, no project activities will occur within 50 feet of the nest until a plan to identify the species using the nest and protect nesting and overwintering Crotch's bumble bee has been submitted to CDFW and approved in writing by CDFW.		qualified biologist during construction activities	qualified biological subconsultant		
Project-Related Mortality and/or Disturbance to Monarch Butterfly						
BIO-22	(Pre-construction Surveys): A survey of the project site will be conducted by a qualified biologist (someone who can identify the species and is familiar with the species' host plants) within 15 days prior to construction activities to determine if milkweeds plants are located within the site during the breeding season (February 1 to August 31). If no milkweed plants are observed, no further mitigation is required.	Prior to construction activities	Once, as determined by qualified biologist during construction activities	KDWCD with assistance of a qualified biological subconsultant	Report	
BIO-23	(Avoidance): If milkweeds are observed within the site during the breeding season (February 1 to August 31), an avoidance buffer will be placed around the area as to not to disturb the plant or its root system. The buffer will be left in place until a qualified biologist has determined the buffers are no longer warranted.	Upon discovery of milkweeds between February 1 to August 31	Once, as determined by qualified biologist during construction activities	KDWCD with assistance of a qualified biological subconsultant	Report	
BIO-24	(Consultation with USFWS if Listed): In the event a milkweed plant is detected during the pre-construction survey and cannot be avoided and this species is listed under the ESA prior to this observation, consultation with USFWS will be completed to avoid take.	Upon discovery of milkweeds during pre-construction survey	Once, as determined by qualified biologist during construction activities	KDWCD with assistance of a qualified biological subconsultant	Report	
Project-Related Mortality and/or Disturbance of Pallid bats and Maternity Roosting Bats						
BIO-25	(Pre-Construction Survey): If suitable habitat is observed within the work area during the general pre-construction surveys (BIO-7) and construction activities fall between March 1 and September 30 (bat maternity season) and December 1 through February 28 (overwintering season) a qualified biologist (someone who is familiar with and can	Upon discovery of suitable habitat during pre-construction survey	Once, as determined by qualified biologist during construction activities	KDWCD with assistance of a qualified biological subconsultant	Report	

Mitigation, Monitoring, and Reporting Program						
Item	Mitigation Measure	When Monitoring is to Occur	Frequency of Monitoring	Agency Responsible for Monitoring	Method to Verify Compliance	Verification of Compliance
	identify bat roosts) will conduct a pre-construction survey to identify active bat roosting locations in trees or bridges near the work area. A qualified biologist will conduct the survey 7 days or less prior to construction.					
BIO-26	(Disturbance to Trees and Bridges): If any trees must be removed or any bridges must be disturbed, a qualified biologist will inspect these features prior to these activities to verify that there are no active bat roosts. Once the feature is deemed clear of bats, these activities will be initiated within two days.	During construction activities	During Construction	KDWCD	Report	
BIO-27	(Avoidance Buffers): On discovery of any sensitive bat roosts near work areas, a qualified biologist will determine appropriate avoidance buffers based on the biology of the species, conditions of the roost(s), and the level of project disturbance, if appropriate. If necessary, avoidance buffers will be identified with flagging, fencing, or other easily visible means, and will be maintained until the biologist has determined that the roost will no longer be impacted by construction.	Upon discovery of any sensitive bat roosts	During Construction	KDWCD	Report	
BIO-28	(Maternity and Overwintering Roost Avoidance): During the maternity roosting season (March 1 through September 30) project activities will not occur within 100 feet of any identified maternity bat roost between sunset and sunrise. During the pallid bat overwintering roosting season (December 1 through February 28) project activities will not occur within 100 feet of any identified overwintering bat roost. Lighting is not to be used near roosts where it would shine on or into the roost entrance. Combustion equipment, such as generators, pumps, and vehicles are not to be parked, operated, under or adjacent to the roost.	March 1 to September 30	Once, as determined by qualified biologist during construction activities	KDWCD with assistance of a qualified biological subconsultant	Report	
Permits						
BIO-29	(Permits): If necessary, permits with USACE, RWQCB, CDFW, and CVFPB will be obtained for work	Prior to construction activities	Once	KDWCD	Report	

Mitigation, Monitoring, and Reporting Program						
Item	Mitigation Measure	When Monitoring is to Occur	Frequency of Monitoring	Agency Responsible for Monitoring	Method to Verify Compliance	Verification of Compliance
	within the rivers, streams, creeks, and sloughs of the project site. These permits, certifications, and agreements would ensure there are no indirect downstream effects to jurisdictional waters.					
Cultural Resources						
CUL-1	(Archaeological Resources): In the event that archaeological remains 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	KDWCD		
CUL-2	(Human Remains): If human remains are uncovered, or in any other case when human remains are discovered during construction, the Tulare County or Kings County Coroner is to be notified to arrange their 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	KDWCD		
Tribal Cultural Resources						
See **CUL-1** and **CUL-2**.						

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APPENDICES

Appendix A- Biological Resources Evaluation

KAWEAH DELTA WATER CONSERVATION DISTRICT

RIVER/STREAM MAINTENANCE PROJECT BIOLOGICAL EVALUATION

TULARE AND KINGS COUNTIES
NOVEMBER 2024

PREPARED FOR:
Kaweah Delta Water Conservation District
Tulare and Kings County

PREPARED BY:
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ACRONYMS AND ABBREVIATIONS

BMP ..... Best Management Practices
BUOW..... Burrowing Owl
CDFW.....California Department of Fish and Wildlife
CEQA .....California Environmental Quality Act
CNDDB..... California Natural Diversity Database
CNPS.....California Native Plant Society
CVFPB… .....Central Valley Flood Protection Board
District .....Kaweah Delta Water Conservation District
EPA ..... Environmental Protection Agency
°F…… .....degrees Fahrenheit
IPaC .....United States Fish and Wildlife Service's Information for Planning and Consultation system
MBTA..... Migratory Bird Treaty Act
NEPA.....National Environmental Policy Act
NRCS..... Natural Resources Conservation Service
Project .....River/Stream Maintenance Project
Provost & Pritchard.....Provost & Pritchard Consulting Group
RWQCB.....Regional Water Quality Control Board
SWPPP .....Storm Water Pollution Prevention Plan
SWRCB..... State Water Resources Control Board
USACE..... United States Army Corps of Engineers
USC ..... United States Code
USFWS.....United States Fish and Wildlife Service
USGS..... United States Geological Survey

DEFINITIONS

Kaweah River System: The Kaweah River, commencing immediately downstream of the afterbay adjacent to the lower portion of Terminus Dam, Tulare County, California, and continuing downstream in said river and of its distributaries, to the Kaweah Delta Water Conservation District's western boundary, together with portions of certain tributaries to said river, encompassing approximately 209 miles of rivers, creeks, and sloughs, including associated banks, beds, channels, waterways, and areas associated therewith used by the Kaweah Delta Water Conservation District for routine maintenance activities, and as more particularly described in Table 1 and Figure 2.

Channel Banks, Channel Bottoms, and Other Appurtenant Features: Areas within the channel including the sides of the channel, between which the flow is confined.

Debris: Trash, tires, downed trees, logs, and branches.

Diameter at Breast Height (DBH): Diameter of a tree trunk at a point measured approximately 4.5-feet from the base of the trunk at ground level.

Emergency: As defined in the Public Resources Code Section 21060.3: a sudden, unexpected occurrence, involving a clear and imminent danger, demanding immediate action to prevent or mitigate loss of, or damage to, life, health, property, or essential public services.

Low-flow: Flow in the channel that meets either of the following criteria:

a. Any flow of water with a depth of 1-foot or less, measured from the bottom of the channel.
b. Any flow of water less than 15 cubic feet per second with a depth of greater than 1-foot, measured from the bottom of the channel.

Maintenance Activities: Routine activities performed by Kaweah Delta Water Conservation District's (District) maintenance crews, contractors, or agents, which are more particularly described in the Project Description.

Routine Maintenance: Activities performed by District's maintenance crews, contractors, or agents which are defined in the Project Description, which includes work that is performed regularly (i.e., every 1 to 5 years) in the Stream Channels. The District performs Routine Maintenance to maintain the functional and structural integrity of its facilities for the purpose of flood control. Routine Maintenance includes but is not limited to the following activities: removal of debris, sediment, vegetation, downed trees, and other materials that could obstruct the natural flow of a drainage; controlling weeds, grasses, emergent vegetation, and woody vegetation; repairing gates, barricades, culverts, and small structures; bank stabilization; and erosion control.

Special Status Species: Any species defined in California Code of Regulations Section 15380; species that are fully protected pursuant to the California Fish and Game Code; species protected pursuant to the Migratory Bird Treaty Act (MBTA); and/or species identified by California Department of Fish and Wildlife or other State or federal resource agencies as a species of special concern.

Stream: The channel, seep, waterway, or area associated with the operation of water where the District will perform routine maintenance projects, all of which are identified in Figure 2. "Stream" includes perennial, intermittent, ephemeral, and permanent bodies of water within a natural streambed.

Stream Channel: The portion of the stream through which water and sediment flow, have flowed, or are capable of flowing, delineated by the top of the bank or the outer edge of any riparian vegetation.

Type 1 Channel: Natural waterways with wide channel bottoms. Typical conditions within the channel cross-section consist of the absence of vegetation on the lower half and the potential presence of vegetation on the upper half.

Type 2 Channel: Natural waterways with narrow channel bottoms. Typical conditions within the channel cross-section consist of absence of vegetation and the potential presence of vegetation on the top of the bank.

1 INTRODUCTION

This Biological Evaluation, prepared by Provost & Pritchard Consulting Group (Provost & Pritchard) in compliance with the California Environmental Quality Act (CEQA), includes descriptions of the biological resources present or with potential to occur within the Kaweah Delta Water Conservation District (District) River/Stream Maintenance Project (or "project"), potential project-related impacts or effects to those resources, and mitigation measures to reduce these impacts and effects to a less-than-significant level under CEQA.

1.1 PROJECT DESCRIPTION

The District boundary is located in the south-central portion of the San Joaquin Valley within portions of both Tulare and Kings Counties. The total area of the District is about 340,000 acres with approximately 255,000 acres located in the western portion of Tulare County and 85,000 acres, in the northeastern portion of the Kings County (see Figure 1 and Figure 2). The project site (or "site") encompasses approximately 209 miles of rivers, streams, creeks, and sloughs that are tributaries or distributaries to the Kaweah River within Tulare and Kings Counties, California, as illustrated in Table 1, and Figure 2. The site is limited to these waters and includes the bed and banks of each of these waterways with the outer limits between the top of bank or edge of riparian vegetation, whichever is greater.

For several decades, the District has been performing routine maintenance activities within the Kaweah River System as part of their ongoing operations of flood-control maintenance. The maintenance activities include longstanding and ongoing maintenance activities that protect downstream properties and allow the channels to serve the function of flood control.

The project consists of routine channel maintenance within the District for the purpose of flood control. Living and dead vegetation, accumulations of sand and sediment, and debris will be removed from within channels and along each bank. Over-hanging limbs, invasive vegetation, hazardous or dead trees, and other debris will be removed. Heavy equipment such as excavators, bulldozers, skidsteers, dump trucks, and loaders will be utilized. Chainsaws and other hand-held equipment will be used to trim and remove vegetation. Vegetation is then removed from the site or left to decompose naturally after being placed a safe distance from water features. Herbicides will be applied via commercial-grade spray equipment to control weedy vegetation along the channel banks. Repairs and maintenance will be conducted to existing flow control, erosion control, and measurement structures. The project does not propose de-watering of channels as most work will be completed during low-flow or while the streambed is dry.

1.2 REPORT OBJECTIVES

Maintenance activities such as those proposed by the project could potentially impact biological resources or habitats that are critical for sensitive plant and wildlife species. In cases such as these, development may be regulated by state or federal agencies, and/or addressed by local regulatory agencies.

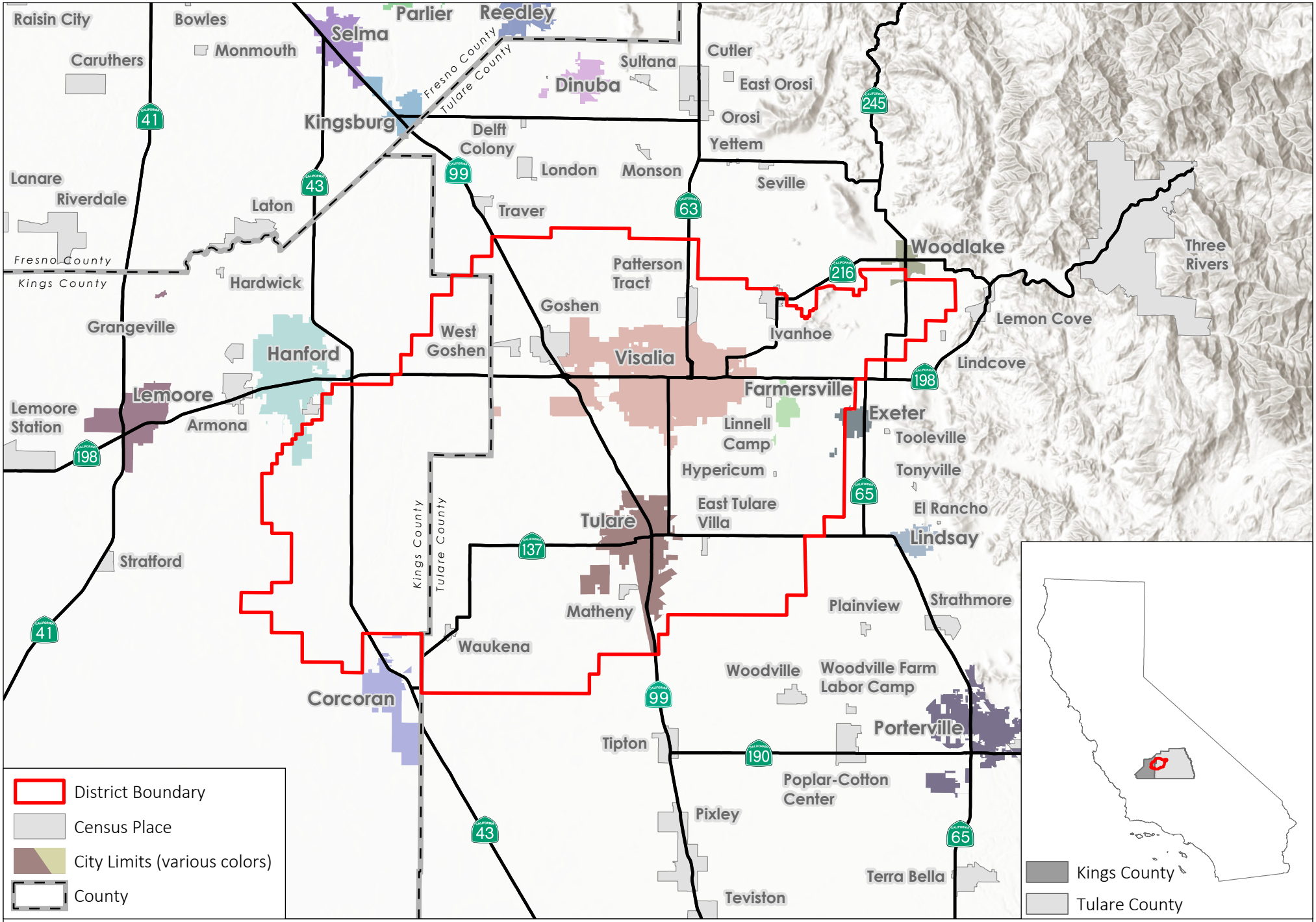
This report addresses issues related to the following:

- The presence of sensitive biological resources onsite, or with the potential to occur onsite.
- The federal, state, and local regulations regarding these resources.
- 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 to:

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

- Make reasonable inferences about the biological resources that could occur on the site based on habitat suitability and the proximity of the site to a species' known range.
- Summarize all state and federal natural resource protection laws that may be relevant to implementation of the project.



Regional Vicinity Map

Kaweah Delta Water Conservation District - River/Stream Maintenance Program

PROVOST& PRITCHARD

Fig. 1 Page 1-3

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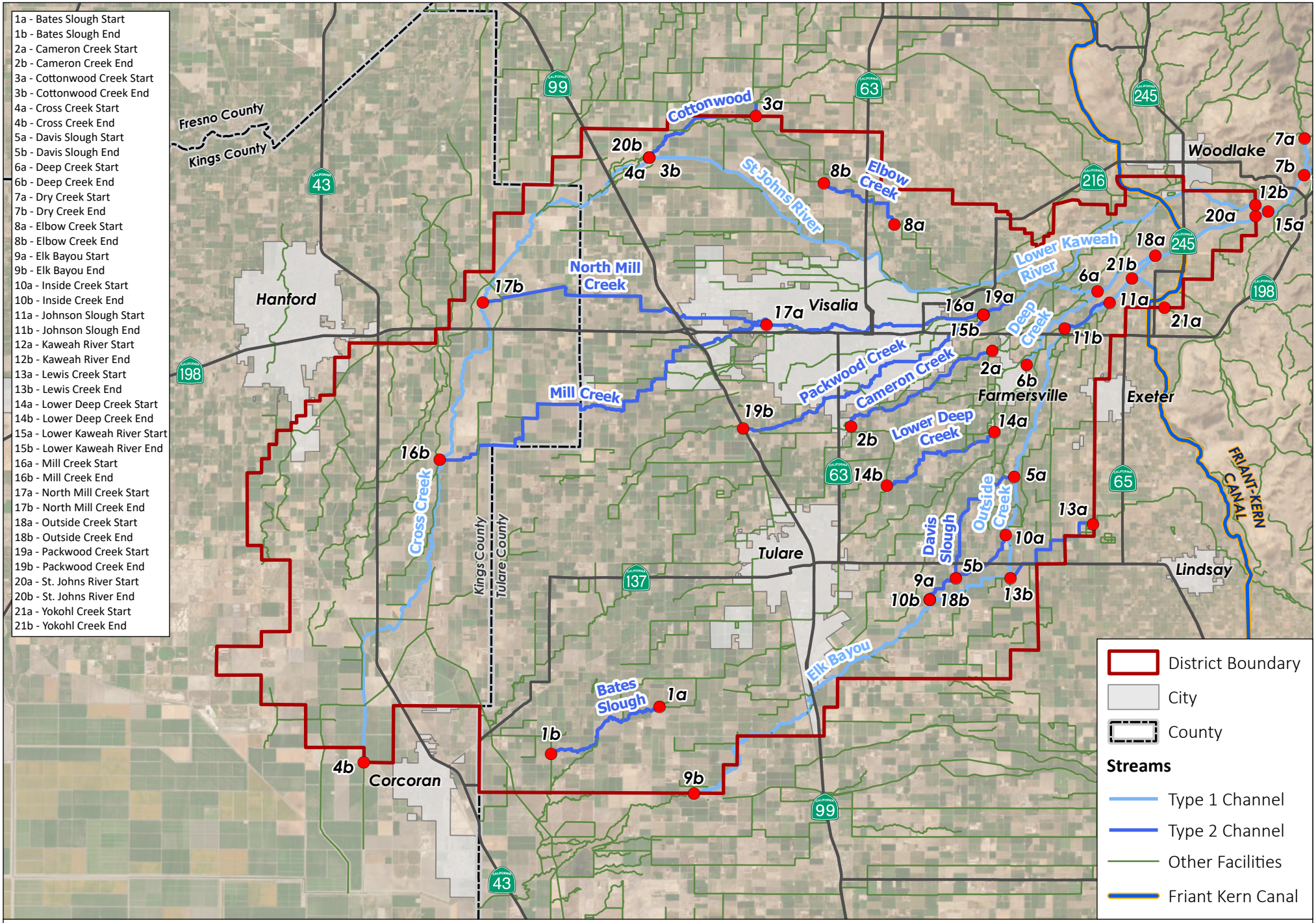

Aerial Map

Kaweah Delta Water Conservation District - River/Stream Maintenance Program

PROVOST& PRITCHARD

Fig. 2 Page 1-4

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1.3 STUDY METHODOLOGY

A reconnaissance-level field survey of the site was conducted on October 30, 2024, by Provost & Pritchard biologist, Shaylea Stark. The survey consisted of walking and driving throughout representative areas of the site while identifying and noting land uses, biological habitats and communities, and plant and animal species encountered. Habitats were also assessed to help with determining if they could be suitable for various rare or protected plant and animal species. Representative photographs of the site were taken and are presented in Appendix A.

Ms. Stark then utilized the results of the field survey to conduct an analysis of potential project-related impacts to biological resources based on the resources known to occur or with the potential to occur within the site. Sources of information used in preparation of this analysis included: California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database (CNDDB; see Appendix B for the species list) and California Wildlife Habitat Relationships (CWHR) database; California Native Plant Society's (CNPS) Online Inventory of Rare and Endangered Vascular Plants of California; CalFlora's online database of California native plants; Jepson Herbarium's online database (i.e., Jepson eFlora); United States Fish and Wildlife Service's (USFWS) Environmental Conservation Online System, Information for Planning and Consultation (IPaC; see Appendix C for the species list) system, and National Wetlands Inventory (NWI); iNaturalist; NatureServe Explorer's online database; United States Department of Agriculture Natural Resources Conservation Service's (NRCS) Web Soil Survey (see Appendix D for the Web Soil Survey Report); California Herps website; and various manuals, reports, and references related to plants and animals of the San Joaquin Valley region.

The field survey did not include focused surveys for special status species. The field survey conducted included the appropriate level of detail to assess the significance of potential impacts to sensitive biological resources resulting from implementing 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 United States Army Corps of Engineers (USACE), CDFW, Regional Water Quality Control Board (RWQCB) and the State Water Resources Control Board (SWRCB).

2 EXISTING CONDITIONS

2.1 REGIONAL SETTINGS

2.1.1 TOPOGRAPHY

The District's boundaries and project site are located within the *Burris Park, Cairns Corner, Corcoran, El Rico Ranch, Exeter, Goshen, Guernsey, Hanford, Ivanhoe, Monson, Paige, Remnoy, Rocky Hill, Taylor Weir, Tipton, Traver, Tulare, Visalia, Waukena, and Woodlake,* U.S. Geological Survey (USGS) 7.5-minute quadrangles. The topography within the District's boundaries is relatively flat within the valley with small hills in the foothills leading to mountains on the east side of the site. Elevations within the District's boundaries range from approximately 160 to 1,680 feet above mean sea level.

2.1.2 CLIMATE

Like most of California, the site experiences a Mediterranean climate. Warm, dry summers are followed by cool, moist winters. In the summer, average high temperatures range between 85- and 95-degrees Fahrenheit (°F), but often exceed 90 °F, and the humidity is generally low. Winter temperatures are often below 60 °F during the day and rarely exceed 70 °F. On average, the City of Visalia receives approximately 12 inches of precipitation in the form of rain yearly, most of which occurs between October and March (WeatherSpark 2024), and a majority of the site would be expected to receive similar amounts of precipitation, with higher amounts expected in the foothills.

2.1.3 HYDROLOGY

Numerous public and private entities within the District's boundaries divert water from the Kaweah River and its distributaries through 21 different waterways (see Table 1 and Figure 2). Nearly all of the lands served with Kaweah River water are also served irrigation water from groundwater, primarily due to the erratic and relatively undependable nature of flow on the Kaweah River. All municipal and industrial water uses within the District are supplied from groundwater.

Table 1: Kaweah River System

River/ Creek	Start	End	Miles	Type
Bates Slough	Road 66	Avenue 168	5.6	2
Cameron Creek	TID Canal	Mooney's Grove	7.8	2
Cottonwood Creek	Avenue 360	Cross Creek	5.2	2
Cross Creek	St. Johns River	Turner Weir	35.4	1
Davis Slough	Outside Creek	Inside Creek	5.5	2
Deep Creek	Lower Kaweah River	Avenue 168	4.2	1
Dry Creek	Dry Creek Drive	Kaweah River	1.0	1
Elbow Creek	Road 112	Road 132	4.4	2
Elk Bayou	Outside Creek	District Boundary	13.4	1
Inside Creek	Outside Creek	Elk Bayou	4.7	2
Johnson Slough	Road 180	Road 192	2.2	2
Kaweah River	Terminus Afterbay	McKay Point	2.8	1
Lewis Creek	Road 164	Outside Creek	3.2	2
Lower Deep Creek	Road 160	Road 130	5.1	2
Lower Kaweah River	McKay Point	Mill Creek	11.9	1&2
Mill Creek	Lower Kaweah River	Cross Creek	24.9	2
North Mill Creek	Mill Creek	Cross Creek	10.5	2
Outside Creek	Lower Kaweah River	Elk Bayou	17.4	1
Packwood Creek	Lower Kaweah River	Tagus Basin	14.8	2
St. Johns River	McKay Point	Cross Creek	27.2	1

River/ Creek	Start	End	Miles	Type
Yokohl Creek	District Boundary	Outside Creek	1.7	1
		Total	208.9	

2.1.4 SOILS

Sixty-two soil mapping units representing forty-six soil types were identified within the District's boundaries (see Appendix D for the Web Soil Survey Reports).

2.2 BIOTIC HABITATS

While the District's lands contain various habitats, the project's maintenance activities will only occur within the waterways which are composed of riverine habitat. This habitat and its constituent plant and animal species are described in more detail in the following section.

2.2.1 RIVERINE

The channels of the Kaweah River system represent riverine habitat, including rivers, streams, creeks, and sloughs. The majority of the Kaweah River system receives water flows during releases from Terminus Dam for irrigation or flood control. The river system water sources originate from both regulated and unregulated watersheds, such that three different flow conditions can occur. The first and most common being regulated flows, the second being the combination of regulated and unregulated flows and the last and least occurring being only unregulated flows. Channels are commonly dry throughout late summer through spring. Of the channels surveyed in October 2024, the majority were dry. Riverine habitat often occurs in association with a variety of terrestrial vegetation, such as riparian vegetation, which often abuts rivers and streams. Riparian vegetation is located within some of the project site areas and is included with riverine habitat. Riverine habitat provides food, shelter, and spawning and rearing habitat for a variety of native fish and introduced warmwater game fish species. Within the Kaweah River system, common native fish species include Sacramento sucker (*Catostomus occidentalis*) and Sacramento pikeminnow (*Ptychocheilus grandis*); frequently observed non-native species include common carp (*Cyprinus carpio*), mosquitofish (*Gambusia affinis*), largemouth bass (*Micropterus salmoides*), white catfish (*Ameiurus catus*), and bluegill (*Lepomismacrochirus*). Riverine and adjacent riparian vegetation provides suitable nesting habitat for waterfowl, migratory birds, and shorebirds. Waterfowl tracks were observed within the channels, which suggests that avian species use the channels for feeding, year-round. In addition to avian sign, the following mammal tracks were observed: coyote (*Canis latrans*), opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), and striped skunk (*Mephitis mephitis*). Along the banks of the Kaweah River system, the following species were observed: western fence lizard (*Sceloporus occidentalis*) and California ground squirrel (*Otospermophilus beecheyi*).

NATURAL COMMUNITIES OF SPECIAL CONCERN AND RIPARIAN HABITAT

Natural communities of special concern are those that are of limited distribution, distinguished by significant biological diversity, or home to special status species. CDFW has classified and mapped all natural communities in California. Just as the special status plant and animal species (see Section 2.6), these natural communities of special concern can be found within the CNDDB. According to CNDDB, there are five recorded observations of natural communities of special concern with potential to occur within the District's boundaries or vicinity: Great Valley Valley Oak Riparian Forest, Northern Claypan Vernal Pool, Northern Hardpan Vernal Pool, Sycamore Alluvial Woodland, and Valley Sacaton Grassland. Only one of these communities would be expected to occur within the project site. Great Valley Valley Oak Riparian Woodland could occur within the project site as it is present within the boundaries of Kaweah Oaks Preserve in Tulare County.

Riparian habitat is composed of plant communities that occur along the banks, and sometimes over the banks, of most waterways and is an important habitat for numerous wildlife species. CDFW has jurisdiction over most riparian habitat in California. Riparian vegetation was observed within the project site and it would be expected to be present in other portions of the project site.

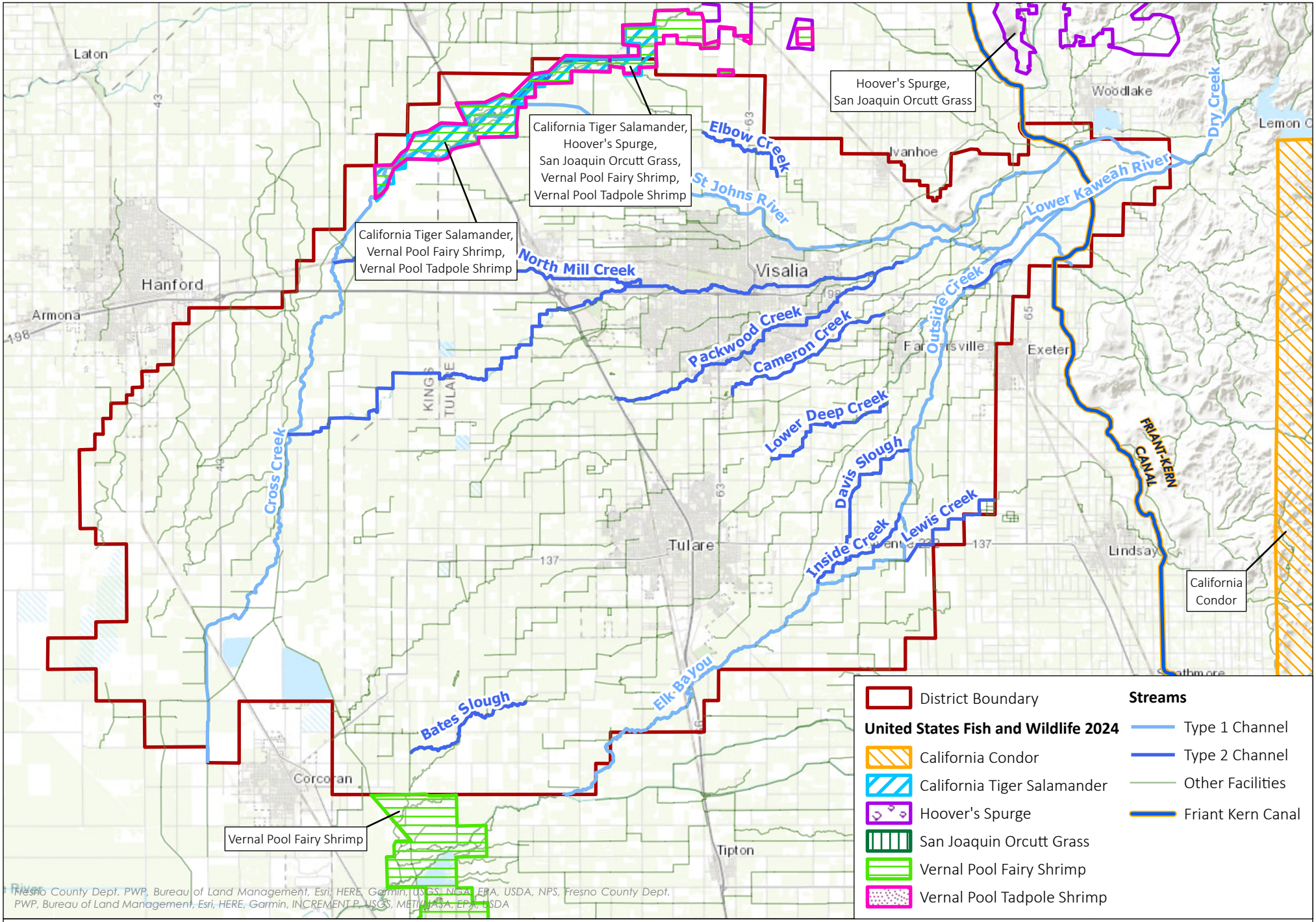
2.3 DESIGNATED CRITICAL HABITAT

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, which may require special management and protection. According to the IPaC, designated critical habitat for California tiger salamander, Hoover's spurge, San Joaquin Valley Orcutt grass, vernal pool fairy shrimp, and vernal pool tadpole shrimp occurs near the District's northern boundary near Cottonwood Creek and Cross Creek, however the project site would not be expected to have any of the Primary Constituent Elements required by these critical habitats (see Figure 3).

2.4 WILDLIFE MOVEMENT CORRIDORS AND NATIVE WILDLIFE NURSERY SITES

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 water features and drainages of the site could provide potential wildlife movement corridors for a variety of wildlife. The project site is located in a fragmented region often disturbed by intensive agricultural cultivation practices and these water features could be used as corridors through this region.

Native wildlife nursery sites are areas where a species or group of similar species raise their young in a concentrated place, such as maternity bat roosts. Areas where maternity bat roosts could occur, such as bridges or buildings, were located within the project site.



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Miles

Critical Habitats Map

Kaweah Delta Water Conservation District - River/Stream Maintenance Program

PROVOST& PRITCHARD

Fig. 3 Page 2-4

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2.5 SPECIAL STATUS PLANTS AND ANIMALS

California contains several rare plant and animal species. In this context, "rare" is defined as a species known to have low populations or limited distributions. Conversion of habitats to accommodate human population growth in turn reduces the already-limited suitable habitat for rare species. This results in rare and sensitive species becoming increasingly more vulnerable to extirpation. State and federal regulations have provided the CDFW and USFWS with mechanisms 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 CNPS has its list of native plants considered rare, threatened, or endangered. Collectively these animals and plants are referred to as "special status species."

A query of the CNDDB for occurrences of special status plant and animal species was conducted for the *Burris Park, Cairns Corner, Corcoran, El Rico Ranch, Exeter, Goshen, Guernsey, Hanford, Ivanhoe, Monson, Paige, Remnoy, Rocky Hill, Taylor Weir, Tipton, Traver, Tulare, Visalia, Waukena, and Woodlake,* USGS 7.5-minute quadrangles that contain the site. A query of the IPaC was also completed for the site. These species, and their potential to occur within the site, are listed in Table 2 and Table 3, below. Other special status species that did not show up in the CNDDB query, but have the potential to occur in the vicinity, are also included in Table 3. Species lists obtained from CNDDB and IPaC are available in Appendix B and Appendix C, respectively. All relevant sources of information, as discussed in the Study Methodology section of this report, as well as field observations, were used to determine if any special status species have the potential to occur within the site.

Table 2: List of Special Status Plants with Potential to Occur on the Site and/or in the Vicinity

Species	Status*	Habitat	Occurrence within the Site
Alkali-sink goldfields (*Lasthenia chrysantha*)	CNPS 1B	Found in vernal pool and wet saline flat habitats in the San Joaquin Valley region at elevations below 700 feet. Blooms February – April.	**Unlikely.** While suitable habitats for this species occur within the District's boundaries, they do not occur within the project site.
Brittlescale (*Atriplex depressa*)	CNPS 1B	Found in the Central Valley in alkaline or clay soils, typically in meadow or annual grassland habitats at elevations below 1,100 feet. Sometimes associated with vernal pools. Blooms June – October.	**Unlikely.** While suitable habitats for this species occur within the District's boundaries, they do not occur within the project site.
Calico monkeyflower (*Diplacus pictus*)	CNPS 1B	Found in the Sierra Nevada foothills and the Tehachapi mountains in bare, sunny, shrubby areas, around granite outcrops within foothill woodland communities at elevations between 450 and 4,100 feet. Blooms March – May.	**Absent.** Habitats required by this species were absent within the project site.
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	**Unlikely.** While suitable habitats for this species occur within the District's boundaries, they do not occur within the project site.

Species	Status*	Habitat	Occurrence within the Site
		elevations below 3,000 feet. Blooms March – May.	
California jewelflower (*Caulanthus californicus*)	FE, CE, CNPS 1B	Found in the San Joaquin Valley and western Transverse Ranges in sandy soils. Occurs on flats and slopes, generally in non-alkaline grassland at elevations between 200 and 6,100 feet. Blooms February – April.	**Absent.** All known populations of this plant within Tulare and Kings Counties have been extirpated.
California satintail (*Imperata brevifolia*)	CNPS 2B	Often found in wet springs, meadows, streambanks, and floodplains, and can also be found in coastal scrub, riparian scrub, Mojavean desert scrub, chaparral, and alkali seeps at elevations below 1,600 feet. Blooms September – May.	**Unlikely.** While suitable habitats for this species occur within the District's boundaries, they do not occur within the project site.
Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*)	CNPS 1B	Found on alkaline and saline soils in vernal pool and playas in grassland habitats at elevations below 4,500 feet. Blooms April – May.	**Unlikely.** While suitable habitats for this species occur within the District's boundaries, they do not occur within the project site.
Earlimart orache (*Atriplex cordulata* var. *erecticaulis*)	CNPS 1B	Found in the San Joaquin Valley in saline and alkaline soils, typically within valley grasslands at elevations below 400 feet. Blooms August – September.	**Unlikely.** While suitable habitat occurs within the District's boundaries, this habitat does not occur within the project site.
Greene's tuctoria (*Tuctoria greenei*)	FE, CNPS 1B	Found in the San Joaquin Valley and other parts of California in vernal pools within valley grassland, wetland, and riparian communities at elevations below 3,500 feet. Blooms May – September.	**Unlikely.** While suitable habitats for this species occur within the District's boundaries, they do not occur within the project site.
Heartscale (*Atriplex cordulata* var. *cordulata*)	CNPS 1B	Found in the Central Valley in saline or alkaline soils within shadscale scrub, valley grassland, and wetland-riparian communities at elevations below 250 feet. Blooms June – July.	**Unlikely.** While suitable habitats for this species occur within the District's boundaries, they do not occur within the project site.
Hoover's spurge (*Euphorbia hooveri*)	FT, CNPS 1B	Found in vernal pools within valley grassland, freshwater wetland, and riparian communities at elevations below 800 feet. Blooms July – September.	**Unlikely.** While suitable habitats for this species occur within the District's boundaries, they do not occur within the project site.

Species	Status*	Habitat	Occurrence within the Site
Kaweah brodiaea (*Brodiaea insignis*)	CE, CNPS 1B	Found in the Sierra Nevada foothills in foothill woodland and valley grassland communities at elevations between 650 and 1,700 feet. Blooms May – June.	**Absent.** The project site is outside of the elevational range for this species and habitats required by this species were absent from the project site.
Lesser saltscale (*Atriplex minuscula*)	CNPS 1B	Found in the San Joaquin Valley in sandy, alkaline soils in alkali scrub, valley and foothill grassland, and alkali sink communities at elevations below 750 feet. Blooms April – October.	**Unlikely.** While suitable habitats for this species occur within the District's boundaries, they do not occur within the project site.
Mud nama (*Nama stenocarpa*)	CNPS 2B	Found in the San Joaquin Valley as well as coastal and inland southern California. This facultative wetland species grows in marshy habitats including lake shores and riverbanks below 2,660 feet. Blooms March – October.	**Unlikely**. While the Kaweah River System potentially provides suitable habitat for this species, most of these waterways have been channelized and do not contain water year-round. There has only been one recorded observation of this species in 1999 near the District's southwestern boundary.
Recurved larkspur (*Delphinium recurvatum*)	CNPS 1B	Occurs in chenopod scrub, cismontane woodland, and grassland habitats on poorly drained, fine, alkaline soils; often in valley saltbush or valley chenopod scrub communities at elevations between 100 and 2,600 feet. Blooms March – June.	**Unlikely.** While suitable habitats for this species occur within the District's boundaries, they do not occur within the project site.
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 soils in valley and foothill grassland and cismontane woodland communities at elevations between 300 and 3,000 feet. Blooms March – May.	**Unlikely.** While suitable habitats for this species occur within the District's boundaries, they do not occur within the project site.
San Joaquin Valley Orcutt grass (*Orcuttia inaequalis*)	FT, CE, CNPS 1B	Found in the eastern San Joaquin Valley and the Sierra Nevada foothills in vernal pools within valley grassland, freshwater wetland, and wetland-riparian communities at elevations below 2,600 feet. Blooms April – September.	**Unlikely.** While suitable habitats for this species occur within the District's boundaries, they do not occur within the project site.
Sanford's arrowhead (*Sagittaria sanfordii*)	CNPS 1B	This species is an aquatic plant and is found in the San Joaquin Valley and other parts of California in freshwater marshes, ponds, canals, and ditches at elevations below 1,000 feet. Blooms May – October.	**Possible.** Some of the ponds and ditches within the District's boundaries potentially provide suitable habitat for this species.

Species	Status*	Habitat	Occurrence within the Site
Spiny-sepaled button-celery (*Eryngium spinosepalum*)	CNPS 1B	Found in the Sierra Nevada foothills and the San Joaquin Valley in vernal pools, swales, and roadside ditches. Often associated with clay soils in vernal pools within grassland communities. Occurs at elevations between 50 and 4,200 feet. Blooms April – July.	**Unlikely.** While suitable habitats for this species occur within the District's boundaries, they do not occur within the project site.
Striped adobe-lily (*Fritillaria striata*)	CT, CNPS 1B	Found in the Sierra Nevada foothills in adobe soil within valley grassland and foothill woodland communities at elevations below 3,300 feet. Blooms February – April.	**Absent.** Habitats required by this species were absent from the project site.
Subtle orache (*Atriplex subtilis*)	CNPS 1B	Found in the San Joaquin Valley in saline depressions in alkaline soils within valley and foothill grassland communities at elevations below 300 feet. Blooms June – October.	**Unlikely.** While suitable habitats for this species occur within the District's boundaries, they do not occur within the project site.
Vernal pool smallscale (*Atriplex persistens*)	CNPS 1B	Occurs in the Central Valley in alkaline vernal pools at elevations below 400 feet. Blooms June – September.	**Unlikely.** While suitable habitat occurs within the District's boundaries, this habitat does not occur within the project site.
Winter's sunflower (*Helianthus winteri*)	CNPS 1B	Found in the Sierra Nevada foothills on steep, south-facing grassy slopes, rock outcrops, and road-cuts at elevations ranging from 600 to 1,500 feet. Blooms year-round.	**Absent.** The site is below the elevational range for this species and habitats required by this species were absent from the project site.

Table 3: List of Special Status Animals with Potential to Occur on the Site and/or in the Vicinity

Species	Status*	Habitat	Occurrence within the Site
American badger (*Taxidea taxus*)	CSSC	Prefers drier open stages of shrub, forest, and herbaceous habitats with friable soils to burrow, but can be found within numerous habitats throughout California, including the margins of agricultural lands. Needs a sufficient prey base of burrowing rodents.	**Unlikely.** While suitable habitats occur within the District's boundaries, this species would not occur within the project site.
Blunt-nosed leopard lizard (*Gambelia sila*)	FE, CE, CFP	Occurs in the San Joaquin Valley region in expansive, arid areas with scattered vegetation. Today they inhabit non-native grassland and alkali sink scrub communities of the valley floor marked by poorly drained, alkaline, and saline soils. They can be found at elevations ranging from approx. 100 to	**Unlikely.** There is only one recorded observation of this species within the District boundaries, and the observation was reported in 1974. In addition, suitable habitats for this species were absent from the project site.

Species	Status*	Habitat	Occurrence within the Site
		2,600 feet. They are absent from areas with steep slopes and dense vegetation, and areas subject to seasonal flooding. Adults may excavate shallow burrows but rely on deeper pre-existing rodent burrows for hibernation and reproduction.	
Buena Vista Lake ornate shrew (*Sorex ornatus relictus*)	FE, CSSC	Prefers moist soils, inhabiting marshes, swamps, and riparian shrublands in the Tulare Basin. Uses stumps, logs, and leaf litter for cover.	**Unlikely.** While suitable habitat potentially occurs within the District's boundaries, there are no species observations in the District, and it is unlikely this species would occur within the site.
Burrowing owl (*Athene cunicularia*)	CSSC	Resides in open, dry grasslands, deserts, scrublands, and other areas with low growing vegetation. Nests and roosts underground in existing burrows created by mammals, most often by ground squirrels, and human-made structures.	**Possible.** The banks along the waterways are suitable for burrowing owl.
California condor (*Gymnogyps californianus*)	FE, CE, CFP	Typically nests in cavities in canyon or cliff faces but has also been recorded nesting in giant sequoias in Tulare County. Requires vast expanses of open savannah, grassland, and/or foothill chaparral in mountain ranges of moderate altitude. Forages for carrion up to 100 miles from their roost/nest sites.	**Unlikely.** The site lacked suitable nesting habitat. While this species may fly over the site or forage within the site, it would not be expected to nest within the site. There are no recorded observations of this species on CNDDB within the regional vicinity of the project.
California tiger salamander – central California DPS (*Ambystoma californiense*)	FT, CT	Requires vernal pools or seasonal ponds for breeding and small mammal burrows for aestivation. Generally found in grassland and oak savannah plant communities in central California from sea level to 1,500 feet in elevation. Can migrate up to 1.3 miles to breed.	**Unlikely.** While suitable habitats occur within the District's boundaries, they are absent from the project site.
Conservancy fairy shrimp (*Branchinecta conservatio*)	FE	Found in large, turbid freshwater vernal pools in the Central Valley, from Tehama County in the north to Merced County in the south, with one outlying population in Ventura County's Interior Coast Ranges.	**Unlikely.** Suitable vernal pool habitat exists for this species within the District's boundaries, but this species has never been documented in the region and the nearest known population is over 70 miles away.
Crotch's bumble bee (*Bombus crotchii*)	CCE	Occurs throughout coastal California, as well as east to the Sierra Nevada-Cascade crest, and south into Mexico. Food plant genera include	**Possible.** Riparian and other vegetation and portions of the project site likely provide suitable foraging and nesting habitats for this species.

Species	Status*	Habitat	Occurrence within the Site
		snapdragons, scorpionweeds, primroses, poppies, and buckwheats. Nests are often located underground in abandoned rodent nests, or above ground in tufts of grass, old bird nests, rock piles, or cavities in dead trees. This species overwinters under leaf litter or soft soil.	
Foothill yellow-legged frog – south Sierra Distinct Population Segment (*Rana boylii*)	FC, CE	Frequents rocky streams and rivers with rocky substrate and open, sunny banks in forests, chaparral, and woodlands. Occasionally found in isolated pools, vegetated backwaters, and deep, shaded, spring-fed pools.	**Unlikely.** Habitats of the project site were marginal for this species. Most of the project site is near or below the lower elevational range for this species. The only occurrence within the District's boundaries is from over 80 years old and is listed as extirpated.
Fisher- Southern Sierra Nevada-ESU (*Pekania pannanti*)	FE, CT	Can be found in intermediate to large-tree stages of coniferous forests with high percent canopy closure, generally within the low-medium elevational areas of the southern Sierra Nevada.	**Absent.** Suitable habitats for this species were absent within the District's boundaries and project site.
Fresno kangaroo rat (*Dipodomys nitratoides exilis*)	FE, CE	An inhabitant of alkali sinks and open grassland habitats in Merced, Kings, Fresno, and Madera counties. Prefers bare, alkaline, clay-based soils subject to seasonal inundation with more friable soil mounds around shrubs and grasses. The most recent recorded observation of this species in California was in 1992 in Fresno County.	**Unlikely.** The annual grassland and alkali desert scrub habitat within the District may provide suitable habitat for this species, however this species has not been observed in California in over 30 years and suitable habitats for this species were absent from the project site.
Giant kangaroo rat (*Dipodomys ingens*)	FE, CE	Inhabits annual grassland communities with few or no shrubs and well-drained, sandy-loam soils on gentle slopes on the western side of the San Joaquin Valley.	**Unlikely.** The annual grassland and alkali desert scrub habitat within the District provided suitable habitat for this species, however these habitats were absent from the project site.
Loggerhead shrike (*Lanius ludovicianus*)	CSSC	Frequents open habitats with sparse shrubs and trees, other suitable perches, bare ground, and low herbaceous cover. In the Central Valley, this species nests in riparian areas, desert scrub, and agricultural hedgerows.	**Possible.** Suitable breeding and foraging habitats were present in the form of riparian trees and shrubs within the site and fallow fields, grazed grasslands, and agricultural crops in the surrounding areas.
Monarch butterfly (*Danaus plexippus*)	FC	Roosts in wind-protected tree groves (eucalyptus, Monterey pine, cypress), with nectar and water sources nearby. Larval	**Possible.** The site contained suitable foraging habitat and this species could travel through the site during the breeding season. While it

Species	Status*	Habitat	Occurrence within the Site
		host plants consist of milkweeds. Winter roost sites extend along the Pacific Coast from northern Mendocino to Baja California, Mexico.	could travel through the site, roosting habitat was absent.
Mountain plover - nesting (*Charadrius montanus*)	CSSC	Breeds on open plains at moderate elevations outside of California. Winters in short-grass plains and fields, plowed or fallow fields, and sandy deserts within California. Prefers flat, bare ground with burrowing rodents.	**Unlikely.** Although, this species is known to winter in parts of California, habitats of the project site are marginal for this species and it would not be expected to nest within the site.
Northern California legless lizard (*Anniella pulchra*)	CSSC	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.	**Unlikely.** While suitable habitat occurs within the District's boundaries, this species would not occur within the project site.
Northern leopard frog (*Lithobates pipiens*)	CSSC	Inhabits grassland, wet meadows, potholes, forests, woodland, brushlands, springs, canals, bogs, marshes, and reservoirs in scattered locations in California. Generally, prefers permanent water with abundant riparian vegetation.	**Absent.** The site is not located within the historic range of any native or introduced populations and there have been no recorded observations of this species within the District boundaries and project site.
Northwestern pond turtle (*Actinemys marmorata*)	FPT, CSSC	An aquatic turtle of ponds, marshes, slow-moving rivers, streams, and irrigation ditches with riparian vegetation. Requires adequate basking sites and sandy banks or grassy open fields to deposit eggs.	**Possible.** This species is known to occur in parts of the Kaweah River, and it could occur within the riverine habitat throughout the site.
Pallid bat (*Antrozous pallidus*)	CSSC	Found in grasslands, chaparral, and woodlands, where it feeds on ground- and vegetation-dwelling arthropods, and occasionally takes insects in flight. Prefers to roost in rock crevices, but may also use tree cavities, caves, bridges, and other human-made structures.	**Possible.** Suitable foraging and roosting habitats were present within the project site. This species could forage over the riparian habitats and could roost in bridges and buildings within and adjacent to the site.
San Joaquin kit fox (*Vulpes macrotis mutica*)	FE, CT	Opportunistically forages in a variety of habitats. Dens in burrows within alkali sink, valley grassland, and woodland habitats in valleys and adjacent foothills and in human-made structures in cities, rangeland, and agricultural areas.	**Unlikely.** While suitable habitat occurs within the District's boundaries, this species would not occur within the project site.
Swainson's hawk (*Buteo swainsoni*)	CT	Nests in large trees in open areas adjacent to grasslands,	**Possible.** There is the potential for this species to nest in trees within

Species	Status*	Habitat	Occurrence within the Site
		grain or alfalfa fields, or livestock pastures suitable for supporting rodent populations.	and adjacent to the site. There are several known previously used nest trees within the District's boundaries and some trees along portions of the project site.
Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*)	FE, CE	Inhabits saltbush scrub and sink scrub communities in the Tulare Lake Basin of the southern San Joaquin Valley. This species needs soft friable soils to burrow.	**Unlikely.** The annual grassland and alkali desert scrub habitats within the District may provide suitable habitat for this species, however these habitats are absent from the project site.
Tricolored blackbird (*Agelaius tricolor*)	CT, CSSC	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 foraging in dairy farm feed fields.	**Possible.** Some of the riverine habitat within the site could provide suitable habitat for this species. The abundance of agricultural fields present within the District's boundaries provide suitable foraging grounds.
Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)	FT	Lives in mature elderberry shrubs in the Central Valley and adjacent foothills from Tehama County south through Merced and Mariposa Counties with two scattered populations in Madera and Fresno Counties. Adults are active from March to June.	**Absent.** The project site is located outside of the current range of this species.
Vernal pool fairy shrimp (*Branchinecta lynchi*)	FT	Occupies vernal and seasonal pools, with clear to tea-colored water, in grass or mud-bottomed swales, and basalt depression pools.	**Unlikely.** There are several recorded observations of this species within the District's northern boundary, along Cottonwood Creek and Cross Creek of the project site. This area contains undeveloped grassland and vernal pools, which provides suitable habitat for this species, however these habitats are absent from the project site.
Vernal pool tadpole shrimp (*Lepidurus packardi*)	FE	Occurs in vernal pools, clear to tea-colored water, in grass or mud-bottomed swales, and basalt depression pools.	**Unlikely.** There are several recorded observations of this species within the District's northern boundary, along Cottonwood Creek and Cross Creek of the project site. This area contains undeveloped grassland and vernal pools, which provides suitable habitat for this species, however these habitats are absent from the project site.
Western mastiff bat (*Eumops perotis californicus*)	CSSC	Found in open, arid to semi-arid habitats, including dry desert washes, flood plains, chaparral, oak woodland, open ponderosa pine forest, grassland, and agricultural areas, where it feeds on insects in flight. Roosts most	**Unlikely.** Suitable foraging and roosting habitats were present within the District's boundaries. This species could forage over the riverine habitat within the site, but it would not be expected to roost in the project site.

Species	Status*	Habitat	Occurrence within the Site
		commonly in crevices in cliff faces but may also use high buildings and tunnels.	
Western spadefoot (*Spea hammondii*)	FPT, CSSC	The majority of the time this species is terrestrial and occurs in small mammal burrows and soil cracks, sometimes in the bottom of dried pools. 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 or seasonal pools, that hold water for a minimum of three weeks, are necessary for breeding.	**Unlikely.** While there have been several recorded observations of this species within the District's northern boundary, they would not be expected to breed or aestivate within the site.
Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)	FT, CE	Suitable nesting habitat in California includes dense riparian willow-cottonwood and mesquite habitats along a perennial river. Once common in the California Central Valley, as well as coastal valleys and riparian habitats east of the Sierra Nevada, habitat loss now constrains the California breeding population to small numbers of birds.	**Absent.** While riparian vegetation is present within portions of the site, there is only one recorded observation in 1919 of this species within the District's boundaries which is listed as extirpated. Furthermore, this species is believed to no longer occur within Tulare or Kings Counties.

***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	CCE	California Endangered (Candidate)
FPT	Federally Threatened (Proposed)	CT	California Threatened
FC	Federal Candidate	CFP	California Fully Protected
		CSSC	California Species of Special Concern

CNPS LISTING

1B	Plants rare, threatened, or endangered in California and elsewhere.
2B	Plants rare, threatened, or endangered in California, but more common 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 rare 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 *CEQA Statute and Guidelines* (AEP 2023), "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 (CWA) (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 (HCP), Natural Community Conservation Plan (NCCP), or other approved local, regional, or state HCP.

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."

3.2 RELEVANT GOALS, POLICIES, AND LAWS

3.2.1 TULARE COUNTY GENERAL PLAN

The Tulare County General Plan contains the following goals and policies related 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 KINGS COUNTY GENERAL PLAN

The Kings County General Plan contains the following goals and policies related to the project:

- Protect natural waterway channels that serve as part of the County's critical floodwater conveyance system.
- Apply the "Natural Resource Conservation" land use designation along the Kings River, Cross Creek, and in environmentally sensitive areas having existing natural watercourses, drainage basins, sloughs, or other natural water features. Permitted uses within designated floodway channels shall be limited to uses such as flood control channels, water pumping stations and reservoirs, irrigation ditches, water recharge basins, limited open public recreational uses such as passive riverside parks, related incidental structures, and agricultural crop production that does not include permanent structures. Construction or development in this designation along the Kings River designated floodway channel shall be subject to the encroachment permit process required by the Central Valley Flood Protection Board.
- Preserve land that contains important natural plant and animal habitats.
- Protect and manage riparian environments as valuable resources.
- Ensure that, in development decisions affecting riparian environments, the conservation of fish and wildlife habitat and the protection of scenic qualities are balanced with other purposes representing basic health, safety, and economic needs.
- Prohibit development within riparian environments over which the County has jurisdiction. However, allow or consider for approval if it determined that significant disturbance of the riparian environment would not occur, the following passive uses or activities"
    - o Streamside maintenance and repair for mandated flood control or water delivery purposes, facilities, and equipment;
    - o Road and utility line crossings;

  - o Grazing and similar agricultural production activities not involving structures or cultivation;
  - o Vegetation removal for integrated pest management programs under guidelines;
  - o Passive recreational uses such as riverside parks and bikeways.
- Balance the protection of the County's diverse plan and animal communities with the County's economic needs.
- Require mitigation measures to protect important plant and wildlife habitats.
- Manage natural stream environments to provide protection for fish habitat.

3.2.3 THREATENED AND ENDANGERED SPECIES

Permits may be required from CDFW and/or USFWS if activities associated with a project have the potential to result in the "take" of a species listed as threatened or endangered under the California Endangered Species Act (CESA) and/or Endangered Species Act (ESA), respectively. Take is defined by CESA 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 ESA to include "harm" (16 USC, Section 1532(19), 50 CFR, Section 17.3). CDFW and USFWS are responsible agencies under CEQA and the National Environmental Policy Act (NEPA). Both agencies review CEQA and NEPA documents in order to determine the adequacy of the treatment of endangered species issues and to make project-specific recommendations for their conservation.

3.2.4 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 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.

3.2.5 MIGRATORY BIRDS

The 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 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 birds covered by the MBTA (Section 3513), as well as any other native non-game birds (Section 3800).

3.2.6 BIRDS OF PREY

Birds of prey are protected in California under provisions of California 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 Bald and Golden Eagle Protection Act (16 USC 668), which makes it unlawful to kill birds or their eggs, or take feathers or nests, without a permit issued by the U.S. Secretary of the Interior.

3.2.7 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.

3.2.8 WETLANDS AND OTHER "JURISDICTIONAL WATERS"

The definition of "waters of the United States" (WOTUS) often changes from one presidential administration to the next and can also be affected by the outcomes of court cases involving federal jurisdiction of waters. The current definition (i.e., "Conforming Rule") was adopted under the Biden Administration in early 2023 and was subsequently revised in September 2023 to incorporate the U.S. Supreme Court's May 25, 2023, decision in the case of *Sackett* v. *Environmental Protection Agency* (EPA). The Conforming Rule has adopted much of the same WOTUS designations as the pre-2015 rules but has incorporated the most recent science and court case rulings. The extent of jurisdiction has been defined in the Code of Federal Regulations (CFR) but is also subject to interpretation by the federal courts. Jurisdictional waters generally include the following categories:

1) *Traditional Navigable Waters, the territorial seas, or interstate waters (not including interstate wetlands);*
2) *Impoundments of waters of the United States;*
3) *Tributaries of:*
    a. *Traditional Navigable Waters, territorial seas, or interstate waters (not including interstate wetlands); or*
    b. *Impoundments of water of the United States when the tributaries meet the relatively permanent standard.*
4) *Wetlands:*
    a. *Adjacent to Traditional Navigable Waters, the territorial seas, or interstate waters;*
    b. *Adjacent to and with a continuous surface connection to relatively permanent impoundments of waters of the United States*
    c. *Adjacent to and with a continuous surface connection to relatively permanent jurisdictional tributaries.*
5) *Intrastate lakes and ponds not identified in items 1 through 4 of this section that are relatively permanent, standing or continuously flowing bodies of water with a continuous surface connection to the waters identified in items 1 or 3 above.*

Exclusions under the new definition include the following:

1) *Waste treatment systems, including treatment ponds or lagoons, designed to meet the requirements of the CWA;*
2) *Prior converted cropland designated by the Secretary of Agriculture. The exclusion would cease upon a change of use, which means that the area is no longer available for the production of agricultural commodities. Notwithstanding the determination of an area's status as prior converted cropland by any other Federal agency, for the purposes of the CWA, the final authority regarding CWA jurisdiction remains with USEPA;*
3) *Ditches (including roadside ditches) excavated wholly in and draining only dry land and that do not carry a relatively permanent flow of water;*
4) *Artificially irrigated areas that would revert to dry land if the irrigation ceased;*
5) *Artificial lakes or ponds created by excavating or diking dry land to collect and retain water and which are used exclusively for such purposes as stock watering, irrigation, settling basins, or rice growing;*
6) *Artificial reflecting or swimming pools or other small ornamental bodies of water created by excavating or diking dry land to retain water for primarily aesthetic reasons;*
7) *Waterfilled depressions created in dry land incidental to construction activity and pits excavated in dry land for the purpose of obtaining fill, sand, or gravel unless and until the construction or excavation operation is abandoned and the resulting body of water meets the definition of waters of the United States; and*

8) *Swales and erosional features (e.g., gullies, small washes) characterized by low volume, infrequent, or short duration flow.*

The Conforming Rule has incorporated the best available science, relevant supreme court cases, public comment, technical expertise, and experience gained from more than 45 years of implementing the pre-2015 "waters of the United States" framework to inform jurisdictional limits. One significant court case involves the U.S. Supreme Court in its *2001 Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers (SWANCC)* decision. It was determined that 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 United States Supreme Court ruled that a significant nexus between a wetland and other navigable waters must exist for the wetland itself to be considered a jurisdictional water. The Supreme Court heard *Sackett* v. *United States EPA* in May 2023, to determine governing standards of a significant nexus between waters of the United States and adjacent wetlands. The court decided that adjacent wetlands would be protected under the CWA only if it maintained a continuous surface water connection with a federal water body. This decision has limited protection for networks of wetlands connected to navigable waters through subsurface flow. The final decision was enacted in September 2023.

The USACE regulates the filling or grading of waters of the United States. under the authority of Section 404 of the CWA. 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 United States 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 results 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 SWRCB has regulatory authority to protect the water quality of all surface water and groundwater in 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 WOTUS 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 WOTUS, 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 acre or more 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 WOTUS may require an 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 any material from their bed or bank, or deposits debris within them require a notification of a 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 avoidance and

minimization measures will be implemented to protect the habitat values of the lake or drainage in question and the plant, fish, and wildlife species that may be present within these resources.

3.3 POTENTIALLY SIGNIFICANT PROJECT-RELATED IMPACTS AND MITIGATION

Species protected by California Fish and Game Code, CDFW, USFWS, or CEQA that have the potential to be impacted by project activities include: Sanford's arrowhead, burrowing owl (BUOW), Crotch's bumble bee, loggerhead shrike, monarch butterfly, northwestern pond turtle, pallid bat, Swainson's hawk, and tricolored blackbird. Other sensitive resources that have the potential to be impacted by the project include jurisdictional waters, wildlife movement corridors, native wildlife nursery sites, riparian habitat, and natural communities of special concern. Corresponding mitigation measures can be found below.

3.3.1 GENERAL PROJECT-RELATED IMPACTS

The project has the potential to impact a number of sensitive resources, as described in more detail in the following sections. Impacts to these resources would be considered a potentially significant impact under CEQA and may be a violation of state and federal laws. Implementation of the following measures will help reduce potential impacts to these resources to a less than significant level under CEQA and will help with complying with state and federal laws protecting these resources:

Mitigation Measure BIO-1a (*WEAP Training*): Prior to initiating construction activities (including staging and mobilization), all personnel associated with project construction will attend a 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 work area. The specifics of this program will 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. This training will discuss special status species, describe the laws and regulations in place to provide protection of these species, identify the penalties for violation of applicable environmental laws and regulations, and include a list of required protective measures to avoid "take." A fact sheet summarizing this information, along with photographs or illustrations of sensitive species with potential to occur on the site, will also be prepared for distribution to all contractors, their employees, and all other personnel involved with construction of the project. All trainees will sign a form documenting that they have attended WEAP training and understand the information presented to them.

Mitigation Measure BIO-1b (*Operational Hours*): Construction activities will be limited to a half hour after sunrise through a half hour before sunset, when possible, to reduce potential impacts to wildlife movement corridors.

Mitigation Measure BIO-1c (*Access Routes*): In order to reduce disturbance to wildlife species and habitat occurring adjacent to work areas, equipment access into work areas will be limited to ingress/egress corridors from existing roads. If new access through streams or wetlands is necessary, the vehicle route will be constructed in an appropriate location chosen by a qualified biologist based on minimal disturbance to the riparian corridor.

Mitigation Measure BIO-1d (*Avoid Removal of Native Trees*): Maintenance projects will minimize the trimming or removal of living native trees (DBH 4" or greater) within the upper half of Type 1 channels. The trimming or removal will be based upon one or more of the following criteria:

a) Be in clear danger of falling into the channel;
b) Significantly reduce channel capacity;
c) Would result in accelerated erosion; and
d) Obstruct or impede access routes.

Mitigation Measure BIO-1e (*Daily Inspection of Site and Equipment*): The construction crew will inspect the work area each day prior to the start of work. If any special status species are observed, they will be avoided and allowed to passively leave the site prior to the initiation of construction. Construction crews will inspect areas beneath equipment at the beginning and end of each workday to prevent mortality or injury to special status species by vehicle strike. Furthermore, equipment will be inspected for leaks prior to the start of work each day to prevent contamination of water within the channel.

Mitigation Measure BIO-1f (*Avoid Impacts to Active Channel*): When feasible, maintenance projects involving the removal of sand or operation of heavy equipment within the streambed will occur when the channel is dry.

Mitigation Measure BIO-1g (*General Pre-Construction Surveys and Avoidance Buffers*): Pre-construction surveys for special status plants, animals, and Natural Communities of Special Concern will be conducted by a qualified biologist within 30 days prior to the beginning of construction activities. Pre-construction surveys within Natural Communities of Special Concern will include photographs documenting existing site conditions. If sensitive biological resources are present onsite, the biologist will establish an appropriate avoidance buffer zone and label sensitive resources or areas of avoidance with flagging, fencing, or other easily visible means.

Mitigation Measure BIO-1h (*Post-Construction Survey and Photographs*): For all construction activities within Natural Communities of Special Concern, a qualified biologist will perform a post-construction survey within 30 days of completion and capture representative pictures of the work areas. Pre- and post-construction photographs documenting site conditions will be compiled and sent to CDFW for review yearly. If unforeseen impacts have occurred within Natural Communities of Special Concern, CDFW will be consulted immediately.

Mitigation Measure BIO-1i (*Avoidance of Special Status Species*): If a special status animal is observed onsite, they will be avoided and allowed to passively leave the site prior to the start of construction activities. On discovery of active nests, dens, burrows, roosts of a special status or otherwise protected species (i.e., migratory bird, USFWS- or CDFW-listed species, California special status species, or rare plant) near work areas, the biologist will determine avoidance buffers based on applicable CDFW guidelines and/or the biology of the species in question. Avoidance buffers will be identified with flagging, fencing, or other easily visible means. If an active nest, den, burrow, or roost of a special status or otherwise protected species is present within the work area and avoidance is not feasible, CDFW and/or USFWS will be consulted to determine the best course of action.

Mitigation Measure BIO-1j (*BMPs*): The project proponent will require that all workers employ the following best management practices (BMPs) in order to avoid and minimize potential impacts to special status species:

- Vehicles will observe a 15-mph speed limit while on unpaved access routes.

- The presence of any special status species will be reported to the project's qualified biologist, who will submit the occurrence to the CNDDB. If necessary, the biologist will report the occurrence to CDFW and/or USFWS.

3.3.2 PROJECT-RELATED IMPACTS TO SPECIAL STATUS PLANT SPECIES

Sanford's arrowhead has the potential to occur within the site. Projects that adversely affect Sanford's arrowhead or result in the mortality of this species, it would be considered a significant impact under CEQA.

Implementation of the following measures will reduce potential impacts to Sanford's arrowhead to a less than significant level under CEQA.

Mitigation Measure BIO-2a (*Focused Survey*): Since this species is perennial and can be identified throughout the year a qualified botanist/biologist (someone able to identify Sanford's arrowhead) will conduct focused botanical surveys prior to the start of construction if suitable habitat for Sanford's arrowhead occurs within the work area according to CDFW's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (2018) for areas where ground disturbance will occur.

Mitigation Measure BIO-2b (*Avoidance*): If any special status plants are identified during a survey an avoidance buffer and exclusion fencing, if necessary, will be placed around the area to avoid the plants and their root system.

Mitigation Measure BIO-2c (*Formal Consultation*): If rare plant individuals or populations are detected within project work areas during the focused botanical surveys, and the plants cannot be avoided, the project proponent will initiate consultation with CNPS to determine next steps for relocation.

3.3.3 PROJECT-RELATED MORTALITY AND/OR NEST ABANDONMENT OF MIGRATORY BIRDS, RAPTORS, AND SPECIAL STATUS BIRDS, INCLUDING LOGGERHEAD SHRIKE, SWAINSON'S HAWK, AND TRICOLORED BLACKBIRD

The site contains suitable nesting and foraging habitat for a variety of protected bird species, such as migratory birds, raptors, and special status birds, including loggerhead shrike, Swainson's hawk, and tricolored blackbird. It is anticipated that during the nesting bird season, protected birds including loggerhead shrike, Swainson's hawk, and tricolored blackbird could nest on the ground or in shrubs, trees within the site and forage within the site. BUOW could also nest, roost, or forage within the site, however potential impacts to this species and mitigation measures are described in Section 3.3.4. Protected birds located within or adjacent to the site during construction activities have the potential to be injured or killed. In addition to the direct "take" of protected birds within the site or adjacent areas, these birds nesting in these areas could be disturbed by project-related activities resulting in nest abandonment. Projects that adversely affect the nesting success of protected birds or result in the mortality of these birds would be a violation of state and federal laws and considered a significant impact under CEQA.

While foraging habitat for protected birds is present on the site, suitable foraging habitat is located adjacent to the site and within the vicinity of the site. In addition, birds will be able to continue to forage within the site following project activities. Loss of the foraging habitat from implementation of the project is not considered a significant impact.

Implementation of the following measures will reduce potential impacts to protected nesting birds to a less than significant level under CEQA and will help the project comply with state and federal laws protecting these bird species. Mitigation measures specific to BUOW are presented in Section 3.3.4 (i.e., BIO-4a through BIO-4c).

Mitigation Measure BIO-3a (*Avoidance*): The project's construction activities will occur, if feasible, between September 16 and January 31 (outside of the nesting bird season) to avoid impacts to nesting birds.

Mitigation Measure BIO-3b (*Pre-construction Surveys*): If activities must occur within the nesting bird season (February 1 to September 15), a qualified biologist will conduct a single take avoidance survey for Swainson's hawk nests onsite and within a 0.5-mile radius within seven calendar days prior to the start of construction. This survey will be conducted in accordance with the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (Swainson's Hawk Technical Advisory Committee 2000), or current guidance. The Swainson's hawk survey will not be completed between April 21 to June 10 due to the difficulty of identifying nests during this time of year. A qualified biologist will conduct a single take avoidance survey for tricolored blackbird nests onsite and within a 300-foot radius within seven calendar days prior to the start of construction. This survey will be conducted in accordance with CDFWs *Staff Guidance Regarding Avoidance of Impacts to Tricolored Blackbird Breeding Colonies on Agricultural Fields* (California Department of Fish and Wildlife 2015), or current guidance. The surveys would also include inspecting for nesting migratory birds within and up to 100 feet outside of the site and for loggerhead shrike and other nesting raptors within and up to 500 feet outside of the site. All raptor nests would be considered "active" upon the nest-building stage. If no active nests are observed, no further mitigation is required.

Mitigation Measure BIO-3c (*Avoidance Buffers*): On discovery of any active nests or breeding colonies near work areas, a qualified biologist will determine appropriate avoidance buffer distances based on applicable CDFW and/or USFWS guidelines, the biology of the species, conditions of the nest(s), and the level of project disturbance. If necessary, avoidance buffers will be identified with flagging, fencing, or other easily visible means, and will be maintained until the biologist has determined that the nestlings have fledged.

3.3.4 PROJECT-RELATED MORTALITY AND/OR DISTURBANCE TO BURROWING OWL

As discussed in Section 3.3.3, portions of the site contained suitable nesting, roosting, and foraging habitat for BUOW. If suitable habitat or burrows are observed within the work area during the general pre-construction surveys, the biologist will conduct the following mitigation measures. Construction activities that adversely affect the nesting success of BUOWs or result in the mortality of individuals constitute a violation of state and federal laws and would be considered a significant impact under CEQA. While the project site may impact some potential nesting/roosting and foraging habitat for BUOW, there is abundant habitat adjacent to the site that could be used, and implementation of the project would not reduce potential nesting, roosting, and foraging habitat for this species. Therefore, no mitigation measures are warranted for loss of BUOW nesting/roosting and foraging habitat.

Implementation of the following measures would reduce potential impacts to nesting and roosting BUOW to a less than significant level under CEQA and help the project comply with state and federal laws protecting this avian species.

Mitigation Measure BIO-4a (*Pre-construction Take Avoidance Survey*): A qualified biologist (someone familiar with the identification and sign of this species) will conduct a pre-construction take avoidance survey for BUOW and suitable burrows, in accordance with CDFW's *Staff Report on Burrowing Owl Mitigation* (2012), within seven (7) days prior to the start of construction activities if suitable habitat or burrows are observed during the general pre-construction survey (**BIO-1g**).

The survey shall include the proposed work area and surrounding lands up to 500 feet. If no BUOW individuals or active burrows are observed, no further mitigation is required.

Mitigation Measure BIO-4b (*Avoidance*): If an active BUOW burrow is detected, avoidance buffers will be implemented. A qualified biologist will determine appropriate avoidance buffer distances based on CDFW's 2012 *Staff Report on Burrowing Owl Mitigation*, the biology of BUOW, conditions of the burrow(s), and the level of project disturbance, which can be found in the table below. If necessary, avoidance buffers will be identified with flagging, fencing, visual screens, or other easily visible means, and will be maintained until the biologist has determined that nestlings have fledged and all BUOW have left the site.

Level of Disturbance				
Location	Time of Year	Low	Med	High
Nesting sites	April 1-Aug 15	200 meters	500 meters	500 meters
Nesting sites	Aug 16-Oct 15	200 meters	200 meters	500 meters
Nesting sites	Oct 16-Mar 31	50 meters	100 meters	500 meters

Mitigation Measure BIO-4c (*ITP* and *Passive Relocation*): If an active BUOW burrow is detected within the proposed work area and cannot be avoided, it is recommended the project obtain an Incidental Take Permit (ITP) in order to implement a passive relocation plan and protect the project from "take" of this species.

3.3.5 PROJECT-RELATED MORTALITY AND/OR DISTURBANCE TO CROTCH'S BUMBLE BEE

Habitats within portions of the site are likely to be suitable for foraging, nesting, and overwintering Crotch's bumble bee. Queens are actively flying for only two months from March until May and reach maximum flying activity in April. Males are generally present and flying from May to September with peak flying activity occurring in July. Workers of this species are present and flying from April to August, with peak flying activity occurring between May and June. There is likely abundant foraging habitat adjacent to the site that could be used, and implementation of the project unlikely to significantly reduce potential foraging habitat for this species. Therefore, no mitigation measures are warranted for loss of foraging habitat. Construction activities occurring within nesting or overwintering habitat could result in injury, mortality, displacement, disturbance, or inhibit the movement of this species, and would be considered a significant impact under CEQA and a violation of CESA.

Implementation of the following measures will reduce potential impacts to nesting and overwintering Crotch's bumble bee to a less than significant level under CEQA will help the project comply with state laws protecting this species.

Mitigation Measure BIO-5a (*Flying Bumble Bee and Nest Surveys*): If suitable nesting or overwintering habitat (i.e. burrows, old bird nests, rock piles, cavities in dead trees, or significant leaf litter) is observed within the work area during the general pre-construction surveys, a qualified biologist (someone who is familiar with and can identify bumble bees) will conduct three flying bumble bee and nest surveys during the peak flying periods (April, May to June, and July) prior to initial ground disturbing activities. The biologist will walk throughout the site and up to 100 feet outside of the site during the optimal time of the day to inspect for bumble bees and any nests. If an individual is observed, it will be followed until it can be determined if a nest is present within the survey boundary. If no nests are observed, no further mitigation is required.

Mitigation Measure BIO-5b (*Identification and Protection Plan*): Bumble bee individuals need to be captured to be identified. If a bumble bee nest is observed, no project activities will occur within

50 feet of the nest until a plan to identify the species using the nest and protect nesting and overwintering Crotch's bumble bee has been submitted to CDFW and approved in writing by CDFW.

3.3.6 PROJECT-RELATED MORTALITY AND/OR DISTURBANCE TO MONARCH BUTTERFLY

Habitats within portions of the site are likely to be suitable for foraging Monarch butterflies. Monarchs could travel through the site during the breeding season and lay eggs on milkweeds. While it could travel through the site, roosting habitat was absent. There is likely abundant foraging habitat adjacent to the site that could be used, and implementation of the project unlikely to significantly reduce potential foraging habitat for this species. Therefore, no mitigation measures are warranted for loss of foraging habitat. Construction activities during the breeding season could result in injury, mortality, displacement, or disturbance and would be considered a significant impact under CEQA.

Implementation of the following measures will reduce potential impacts to Monarch eggs and larvae to a less than significant level under CEQA will help the project comply with federal laws protecting this species.

Mitigation Measure BIO-6a (*Pre-construction Surveys*): A survey of the project site will be conducted by a qualified biologist (someone who can identify the species and is familiar with the species' host plants) within 15 days prior to construction activities to determine if milkweeds plants are located within the site during the breeding season (February 1 to August 31). If no milkweed plants are observed, no further mitigation is required.

Mitigation Measure BIO-6b (*Avoidance*): If milkweeds are observed within the site during the breeding season (February 1 to August 31), an avoidance buffer will be placed around the area as to not to disturb the plant or its root system. The buffer will be left in place until a qualified biologist has determined the buffers are no longer warranted.

Mitigation Measure BIO-6c (*Consultation with USFWS if Listed*): In the event a milkweed plant is detected during the pre-construction survey and cannot be avoided and this species is listed under the ESA prior to this observation, consultation with USFWS will be completed to avoid take.

3.3.7 PROJECT-RELATED MORTALITY AND/OR DISTURBANCE OF PALLID BATS AND MATERNITY ROOSTING BATS

Trees with natural cavities within the site may support tree-roosting species of bats such as pallid bats, and bridges within the site could support maternity roosting bats. Minor maintenance activities typically have no impact on bats. However, more substantial maintenance operations, including replacement or strengthening of structures above water level, could result in a significant impact. Sealing cracks and crevices could entomb bats or cause abandonment of young; vibrations from noise disturbances could cause awakening from hibernation; and maintenance activities involving the replacement of bridge components or the removal of trees could result in mortality or roost abandonment. Roosting habitat becomes especially sensitive to bat populations during the maternity season (March 1 to September 30) when pups are maturing and during the overwintering season (December 1 through February 28). Projects that impact maternity roosting bats or roosting pallid bats would be considered a significant impact under CEQA.

Implementation of general mitigation measures listed in Section 3.3.1, and the following measures will reduce potential impacts to roosting maternity bats and roosting special status bats to a less than significant level under CEQA.

Mitigation Measure BIO-7a (*Pre-Construction Survey*): If suitable habitat is observed within the work area during the general pre-construction surveys (BIO-1g) and construction activities fall

between March 1 and September 30 (bat maternity season) and December 1 through February 28 (overwintering season) a qualified biologist (someone who is familiar with and can identify bat roosts) will conduct a pre-construction survey to identify active bat roosting locations in trees or bridges near the work area. A qualified biologist will conduct the survey 7 days or less prior to construction.

Mitigation Measure BIO-7b (*Disturbance to Trees and Bridges*): If any trees must be removed or any bridges must be disturbed, a qualified biologist will inspect these features prior to these activities to verify that there are no active bat roosts. Once the feature is deemed clear of bats, these activities will be initiated within two days.

Mitigation Measure BIO-7c (*Avoidance Buffers*): On discovery of any sensitive bat roosts near work areas, a qualified biologist will determine appropriate avoidance buffers based on the biology of the species, conditions of the roost(s), and the level of project disturbance, if appropriate. If necessary, avoidance buffers will be identified with flagging, fencing, or other easily visible means, and will be maintained until the biologist has determined that the roost will no longer be impacted by construction.

Mitigation Measure BIO-7d (*Maternity and Overwintering Roost Avoidance*): During the maternity roosting season (March 1 through September 30) project activities will not occur within 100 feet of any identified maternity bat roost between sunset and sunrise. During the pallid bat overwintering roosting season (December 1 through February 28) project activities will not occur within 100 feet of any identified overwintering bat roost. Lighting is not to be used near roosts where it would shine on or into the roost entrance. Combustion equipment, such as generators, pumps, and vehicles are not to be parked, operated, under or adjacent to the roost.

3.3.8 PROJECT-RELATED MORTALITY AND/OR DISTURBANCE TO NORTHWESTERN POND TURTLE

Northwestern pond turtles are known to occur within the project site. Individuals may enter the work area during construction and be vulnerable to mortality should they seek cover in or under parked equipment or move through the site while equipment is being operated. Furthermore, if a northwestern pond turtle were to nest or overwinter in or along any banks within the site, the individual could be killed or disturbed by use of equipment or destruction of substrate.

Projects that result in the mortality of northwestern pond turtle would be considered a potentially significant impact under CEQA. General mitigation measures **BIO-1a** through **BIO-1j** limit construction activities within the active channel, require daily inspection of site and equipment, require a pre-construction survey by a qualified biologist, and other measures that would help the project avoid and minimize impacts to northwestern pond turtle. These measures will adequately reduce potential impacts to northwestern pond turtle to a less than significant level under CEQA. No additional mitigation measures are required.

3.3.9 PROJECT-RELATED IMPACTS TO REGULATED WATERS, WETLANDS, AND WATER QUALITY

The project involves maintenance within the rivers, streams, creeks, and sloughs of the Kaweah River System. The USFWS National Wetlands Inventory Map was consulted for known wetlands in the area and riverine, freshwater pond, lake, freshwater emergent wetland, and freshwater forested/shrub wetland was classified to be within the boundaries of site. Project-related impacts to some or all of these waters would be considered a potentially significant impact under CEQA and NEPA. Impacts to waters of the U.S. are also subject to the permit requirements of Sections 401 and 404 of the Clean Water Act and impacts to waters of the state are subject to the permit requirements of Section 401 of the Clean Water Act and California

Fish and Game Code. The placement of fill within any wetlands or other jurisdictional features may require a 401 Water Quality Certification from the RWQCB, 404 permit from the USACE, and a Lake or Streambed Alteration Agreement from CDFW. Some of the waterways may be considered a designated floodway or regulated stream under the Central Valley Flood Protection Board (CVFPB). If maintenance is required within any designated floodways or regulated streams an encroachment permit may be required.

There are no designated wild and scenic rivers within the site; therefore, the project would not result in direct impacts to wild and scenic rivers.

If construction involves ground disturbance over an area greater than one acre, the project would need to obtain a Construction General Permit under the Construction Storm Water Program administered by the RWQCB. A prerequisite for this permit is the development of a Storm Water Pollution Prevention Plan to ensure construction activities do not adversely affect water quality. This plan will need to be prepared in support of the Construction General Permit application.

Implementation of the following measures will reduce potential impacts to waters to a less than significant level under CEQA and will comply with state and federal laws protecting these waters.

> Mitigation Measure BIO-8a (*Permits*): If necessary, permits with USACE, RWQCB, CDFW, and CVFPB will be obtained for work within the rivers, streams, creeks, and sloughs of the project site. These permits, certifications, and agreements would ensure there are no indirect downstream effects to jurisdictional waters.

3.3.10 PROJECT-RELATED IMPACTS TO WILDLIFE MOVEMENT CORRIDORS AND NATIVE WILDLIFE NURSERY SITES

The water features of the site could provide potential wildlife movement corridors for a variety of wildlife. The project site is located in a fragmented region often disturbed by intensive agricultural cultivation practices and these water features could be used as corridors through this region.

The site has suitable features that could be used as native wildlife nursery sites. Trees with natural cavities within the site may support tree-roosting species of bats such as pallid bats and bridges may be used other bats for wildlife nursery sites. Project-related impacts to any native wildlife nursery sites would be considered a significant impact under CEQA.

Implementation of the general mitigation measures (BIO1a - BIO1j) will prevent impacts to wildlife movement corridors and measures BIO-7a, through BIO-7d will avoid and minimize impacts to native wildlife nursery sites. Impacts would be temporary, and wildlife may be able to continue using the site at night while construction is occurring and would be able to continue utilizing it after construction activities are completed. These mitigation measures will minimize impacts to these resources to a less than significant level under CEQA and no additional mitigation measures are required.

3.3.11 PROJECT-RELATED IMPACTS TO RIPARIAN HABITAT AND NATURAL COMMUNITIES OF SPECIAL CONCERN

Riparian habitat is likely present along the portions of the project site and Great Valley Valley Oak Riparian Woodland could occur within the project site. These resources could be impacted during maintenance activities. Project-related impacts to riparian habitat and natural communities of special concern would be considered a significant impact under CEQA. A Lake or Streambed Alteration Agreement will be obtained for work within these waterways.

Implementation of the general mitigation measures (BIO1a - BIO1j) will avoid and minimize impacts to these resources to a less than significant level under CEQA. No additional mitigation measures are required.

3.4 LESS THAN SIGNIFICANT PROJECT-RELATED IMPACTS

3.4.1 PROJECT-RELATED IMPACTS TO SPECIAL STATUS PLANT SPECIES ABSENT FROM, OR UNLIKELY TO OCCUR ON, THE PROJECT SITE

Of the 23 regionally occurring special status plant species, 22 are considered absent from or unlikely to occur within the site due to past or ongoing disturbance and/or the absence of suitable habitat. These species include: alkali-sink goldfields, brittlescale, Calico monkeyflower, California alkali grass, California jewelflower, California satintail, Coulter's goldfields, Earlimart orache, Greene's tuctoria, heartscale, Hoover's spurge, Kaweah brodiaea, lesser saltscale, mud nama, recurved larkspur, San Joaquin adobe sunburst, San Joaquin Valley Orcutt grass, spiny-sepaled button-celery, striped adobe-lily, subtle orache, vernal pool smallscale, and Winter's sunflower.

Since it is unlikely that these species would occur onsite, implementation of the project should have no impact on these 22 special status species through construction mortality, disturbance, or loss of habitat. 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 29 regionally occurring special status animal species, 21 are considered absent from or unlikely to occur within the site due to past or ongoing disturbance and/or the absence of suitable habitat. These species include: American badger, blunt-nosed leopard lizard, Buena Vista Lake ornate shrew, California condor, California tiger salamander, conservancy fairy shrimp, foothill yellow-legged frog, fisher, Fresno kangaroo rat, giant kangaroo rat, mountain plover, northern California legless lizard, northern leopard frog, San Joaquin kit fox, Tipton kangaroo rat, valley elderberry longhorn beetle, vernal pool fairy shrimp, vernal pool tadpole shrimp, western mastiff bat, western spadefoot, and western yellow-billed cuckoo.

Since it is unlikely that these species would occur onsite, implementation of the project should have no impact on these 21 special status species through construction mortality, disturbance, or loss of habitat. Mitigation measures are not warranted.

3.4.3 PROJECT-RELATED IMPACTS TO CRITICAL HABITAT

According to the IPaC, designated critical habitat for California tiger salamander, Hoover's spurge, San Joaquin Valley Orcutt grass, vernal pool fairy shrimp, and vernal pool tadpole shrimp occurs within the District's boundary near Cottonwood Creek and Cross Creek (see Figure 3), however the project site is unlikely to meet the Primary Constituent Elements for the critical habitat for these species.

3.4.4 LOCAL POLICIES OR HABITAT CONSERVATION PLANS

The project appears to be consistent with the goals and policies of the Kings County General Plan and the Tulare County General Plan. There are no known HCPs or NCCPs in the project vicinity. Mitigation measures are not warranted.

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APPENDIX A: REPRESENTATIVE PHOTOS OF THE PROJECT SITE

Photograph 1

Overview of riverine habitat within the Saint Johns River.

Photograph 2

Another overview of riverine habitat within the Saint Johns River.

Photograph 3

Overview of riverine habitat within the Bates Slough.

Photograph 4

Overview of riverine habitat within Inside Creek.

Photograph 5

Overview of surrounding grassland habitat adjacent to Cottonwood Creek and Cross Creek.

Photograph 6

Example of surrounding habitat within the District's boundaries which mainly consists of agricultural fields.

APPENDIX B: CNDDB 20-QUAD SPECIES LIST

Selected Elements by Common Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Burris Park (3611945) OR Traver (3611944) OR Monson (3611943) OR Ivanhoe (3611942) OR Woodlake (3611941) OR Rocky Hill (3611931) OR Exeter (3611932) OR Visalia (3611933) OR Goshen (3611934) OR Remnoy (3611935) OR Hanford (3611936) OR Guernsey (3611926) OR Waukena (3611925) OR Paige (3611924) OR Tulare (3611923) OR Cairns Corner (3611922) OR El Rico Ranch (3611916) OR Corcoran (3611915) OR Taylor Weir (3611914) OR Tipton (3611913))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
alkali-sink goldfields *Lasthenia chrysantha*	PDAST5L030	None	None	G2	S2	1B.1
American badger *Taxidea taxus*	AMAJF04010	None	None	G5	S3	SSC
American bumble bee *Bombus pensylvanicus*	IIHYM24260	None	None	G3G4	S2	
An andrenid bee *Andrena macswaini*	IIHYM35130	None	None	G2	S2	
blunt-nosed leopard lizard *Gambelia sila*	ARACF07010	Endangered	Endangered	G1	S2	FP
brittlescale *Atriplex depressa*	PDCHE042L0	None	None	G2	S2	1B.2
burrowing owl *Athene cunicularia*	ABNSB10010	None	Candidate Endangered	G4	S2	SSC
calico monkeyflower *Diplacus pictus*	PDSCR1B240	None	None	G2	S2	1B.2
California alkali grass *Puccinellia simplex*	PMPOA53110	None	None	G2	S2	1B.2
California jewelflower *Caulanthus californicus*	PDBRA31010	Endangered	Endangered	G1	S1	1B.1
California linderiella *Linderiella occidentalis*	ICBRA06010	None	None	G2G3	S2S3	
California satintail *Imperata brevifolia*	PMPOA3D020	None	None	G3	S3	2B.1
California tiger salamander - central California DPS *Ambystoma californiense pop. 1*	AAAAA01181	Threatened	Threatened	G2G3T3	S3	WL
Coulter's goldfields *Lasthenia glabrata ssp. coulteri*	PDAST5L0A1	None	None	G4T2	S2	1B.1
Crotch's bumble bee *Bombus crotchii*	IIHYM24480	None	Candidate Endangered	G2	S2	
Earlimart orache *Atriplex cordulata var. erecticaulis*	PDCHE042V0	None	None	G3T1	S1	1B.2
foothill yellow-legged frog - south Sierra DPS *Rana boylii pop. 5*	AAABH01055	Endangered	Endangered	G3T2	S2	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
great blue heron *Ardea herodias*	ABNGA04010	None	None	G5	S4	
Great Valley Valley Oak Riparian Forest *Great Valley Valley Oak Riparian Forest*	CTT61430CA	None	None	G1	S1.1	
Greene's tuctoria *Tuctoria greenei*	PMPOA6N010	Endangered	Rare	G1	S1	1B.1
heartscale *Atriplex cordulata var. cordulata*	PDCHE040B0	None	None	G3T2	S2	1B.2
hoary bat *Lasiurus cinereus*	AMACC05032	None	None	G3G4	S4	
Hoover's spurge *Euphorbia hooveri*	PDEUP0D150	Threatened	None	G1	S1	1B.2
Hopping's blister beetle *Lytta hoppingi*	IICOL4C010	None	None	G1G2	S2	
Kaweah brodiaea *Brodiaea insignis*	PMLIL0C060	None	Endangered	G1	S1	1B.2
lesser saltscale *Atriplex minuscula*	PDCHE042M0	None	None	G2	S2	1B.1
loggerhead shrike *Lanius ludovicianus*	ABPBR01030	None	None	G4	S4	SSC
Moody's gnaphosid spider *Talanites moodyae*	ILARA98020	None	None	G2G3	S2S3	
Morrison's blister beetle *Lytta morrisoni*	IICOL4C040	None	None	G1G2	S2	
mountain plover *Charadrius montanus*	ABNNB03100	None	None	G3	S2	SSC
mud nama *Nama stenocarpa*	PDHYD0A0H0	None	None	G4G5	S1S2	2B.2
Northern California legless lizard *Anniella pulchra*	ARACC01020	None	None	G3	S2S3	SSC
Northern Claypan Vernal Pool *Northern Claypan Vernal Pool*	CTT44120CA	None	None	G1	S1.1	
Northern Hardpan Vernal Pool *Northern Hardpan Vernal Pool*	CTT44110CA	None	None	G3	S3.1	
northern leopard frog *Lithobates pipiens*	AAABH01170	None	None	G5	S2	SSC
northwestern pond turtle *Actinemys marmorata*	ARAAD02031	Proposed Threatened	None	G2	SNR	SSC
pallid bat *Antrozous pallidus*	AMACC10010	None	None	G4	S3	SSC
recurved larkspur *Delphinium recurvatum*	PDRAN0B1J0	None	None	G2?	S2	1B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
San Joaquin adobe sunburst *Pseudobahia peirsonii*	PDAST7P030	Threatened	Endangered	G1	S1	1B.1
San Joaquin kit fox *Vulpes macrotis mutica*	AMAJA03041	Endangered	Threatened	G4T2	S3	
San Joaquin tiger beetle *Cicindela tranquebarica joaquinensis*	IICOL0220E	None	None	G5T1	S1	
San Joaquin Valley Orcutt grass *Orcuttia inaequalis*	PMPOA4G060	Threatened	Endangered	G1	S1	1B.1
Sanford's arrowhead *Sagittaria sanfordii*	PMALI040Q0	None	None	G3	S3	1B.2
spiny-sepaled button-celery *Eryngium spinosepalum*	PDAPI0Z0Y0	None	None	G2	S2	1B.2
striped adobe-lily *Fritillaria striata*	PMLIL0V0K0	None	Threatened	G1	S1	1B.1
subtle orache *Atriplex subtilis*	PDCHE042T0	None	None	G1	S1	1B.2
Swainson's hawk *Buteo swainsoni*	ABNKC19070	None	Threatened	G5	S4	
Sycamore Alluvial Woodland *Sycamore Alluvial Woodland*	CTT62100CA	None	None	G1	S1.1	
Tipton kangaroo rat *Dipodomys nitratoides nitratoides*	AMAFD03152	Endangered	Endangered	G2T1T2	S2	
tricolored blackbird *Agelaius tricolor*	ABPBXB0020	None	Threatened	G1G2	S2	SSC
Tulare cuckoo wasp *Chrysis tularensis*	IIHYM72010	None	None	G1G2	S2	
valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	IICOL48011	Threatened	None	G3T3	S3	
Valley Sacaton Grassland *Valley Sacaton Grassland*	CTT42120CA	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
vernal pool tadpole shrimp *Lepidurus packardi*	ICBRA10010	Endangered	None	G3	S3	
western mastiff bat *Eumops perotis californicus*	AMACD02011	None	None	G4G5T4	S3S4	SSC
western spadefoot *Spea hammondii*	AAABF02020	Proposed Threatened	None	G2G3	S3S4	SSC
western yellow-billed cuckoo *Coccyzus americanus occidentalis*	ABNRB02022	Threatened	Endangered	G5T2T3	S1	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Winter's sunflower *Helianthus winteri*	PDAST4N260	None	None	G2?	S2?	1B.2

Record Count: 60

APPENDIX C: IPAC 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: 11/12/2024 19:17:24 UTC
Project Code: 2025-0018279
Project Name: Kaweah Delta Water Conservation District River/ Stream Maintenance Project

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

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, 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 U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

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 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 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:

https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see https://www.fws.gov/program/migratory-bird-permit/what-we-do.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

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 Code 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

Project Code: 2025-0018279

Project Name: Kaweah Delta Water Conservation District River/ Stream Maintenance Project

Project Type: Modification Stream or Waterbody

Project Description: The Project consists of routine channel maintenance within the Kaweah River system in Tulare and Kings Counties for the purpose of flood control.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@36.2654646,-119.41114864985866,14z

Counties: Kings and Tulare counties, California

ENDANGERED SPECIES ACT SPECIES

There is a total of 19 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
Buena Vista Lake Ornate Shrew *Sorex ornatus relictus* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1610	Endangered
Fisher *Pekania pennanti* Population: SSN DPS There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3651	Endangered
Fresno Kangaroo Rat *Dipodomys nitratoides exilis* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5150	Endangered
Giant Kangaroo Rat *Dipodomys ingens* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6051	Endangered
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	Endangered

BIRDS

NAME	STATUS
California Condor *Gymnogyps californianus* Population: Wherever found, except where listed as an experimental population There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8193	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
Northwestern Pond Turtle *Actinemys marmorata* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1111	Proposed Threatened

AMPHIBIANS

NAME	STATUS
California Tiger Salamander *Ambystoma californiense* Population: U.S.A. (Central CA DPS) There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2076	Threatened
Western Spadefoot *Spea hammondii* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5425	Proposed Threatened

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

CRUSTACEANS

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

FLOWERING PLANTS

NAME	STATUS
Greene's Tuctoria *Tuctoria greenei* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1573	Endangered
Hoover's Spurge *Chamaesyce hooveri* There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3019	Threatened
San Joaquin Adobe Sunburst *Pseudobahia peirsonii* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2931	Threatened
San Joaquin Valley Orcutt Grass *Orcuttia inaequalis* There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5506	Threatened

CRITICAL HABITATS

There are 5 critical habitats wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
California Tiger Salamander *Ambystoma californiense* https://ecos.fws.gov/ecp/species/2076#crithab	Final
Hoover's Spurge *Chamaesyce hooveri* https://ecos.fws.gov/ecp/species/3019#crithab	Final
San Joaquin Valley Orcutt Grass *Orcuttia inaequalis* https://ecos.fws.gov/ecp/species/5506#crithab	Final
Vernal Pool Fairy Shrimp *Branchinecta lynchi* https://ecos.fws.gov/ecp/species/498#crithab	Final
Vernal Pool Tadpole Shrimp *Lepidurus packardi* https://ecos.fws.gov/ecp/species/2246#crithab	Final

IPAC USER CONTACT INFORMATION

Agency: Private Entity
Name: Shaylea Stark
Address: 455 W Fir Ave
City: Clovis
State: CA
Zip: 93612
Email sstark@ppeng.com
Phone: 5594492700

APPENDIX D: NRCS WEB SOIL SURVEY REPORTS

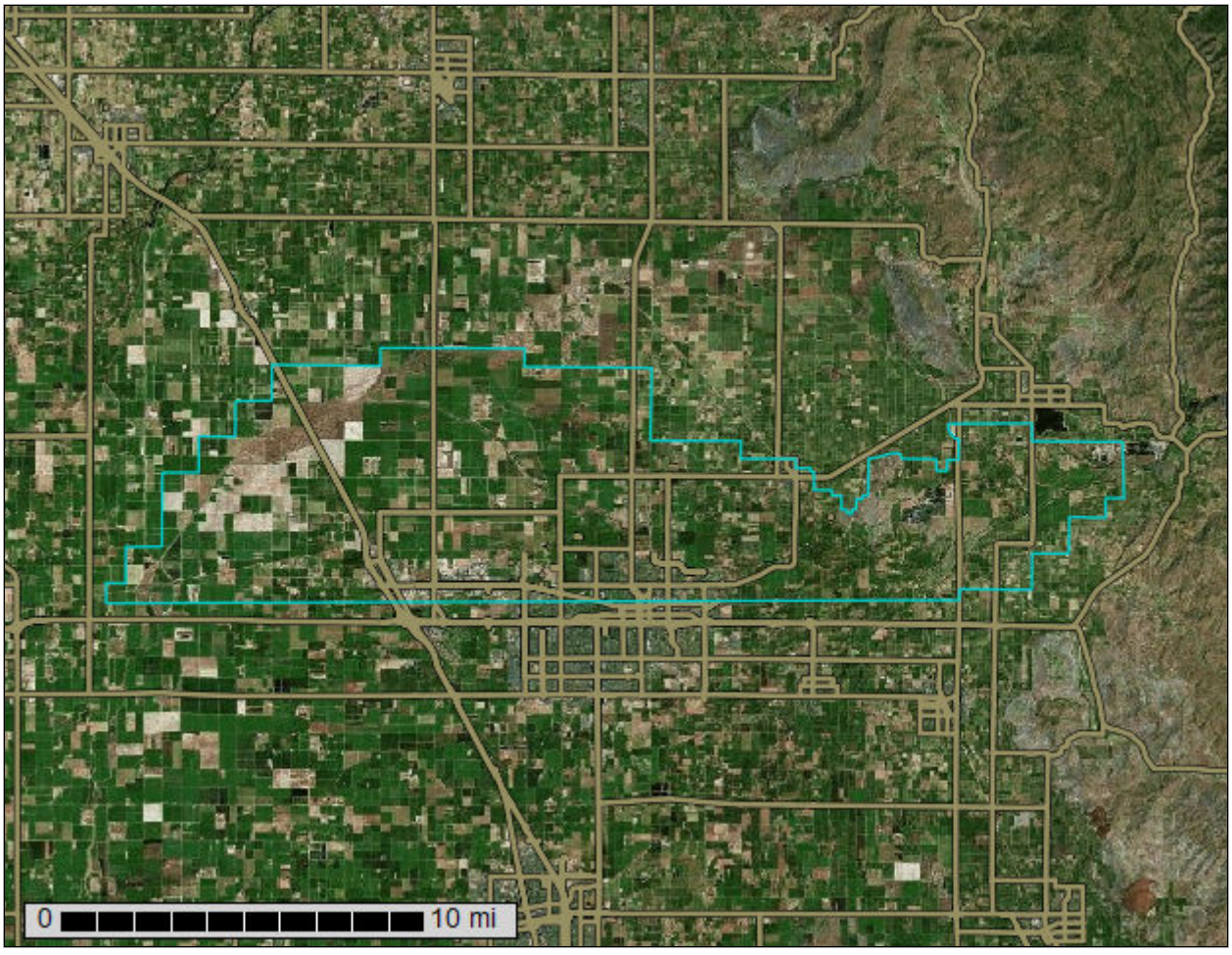
United States Department of Agriculture

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 Kings County, California; Tulare County, California, Central Part; and Tulare County, Western Part, California



November 11, 2024

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.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

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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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.

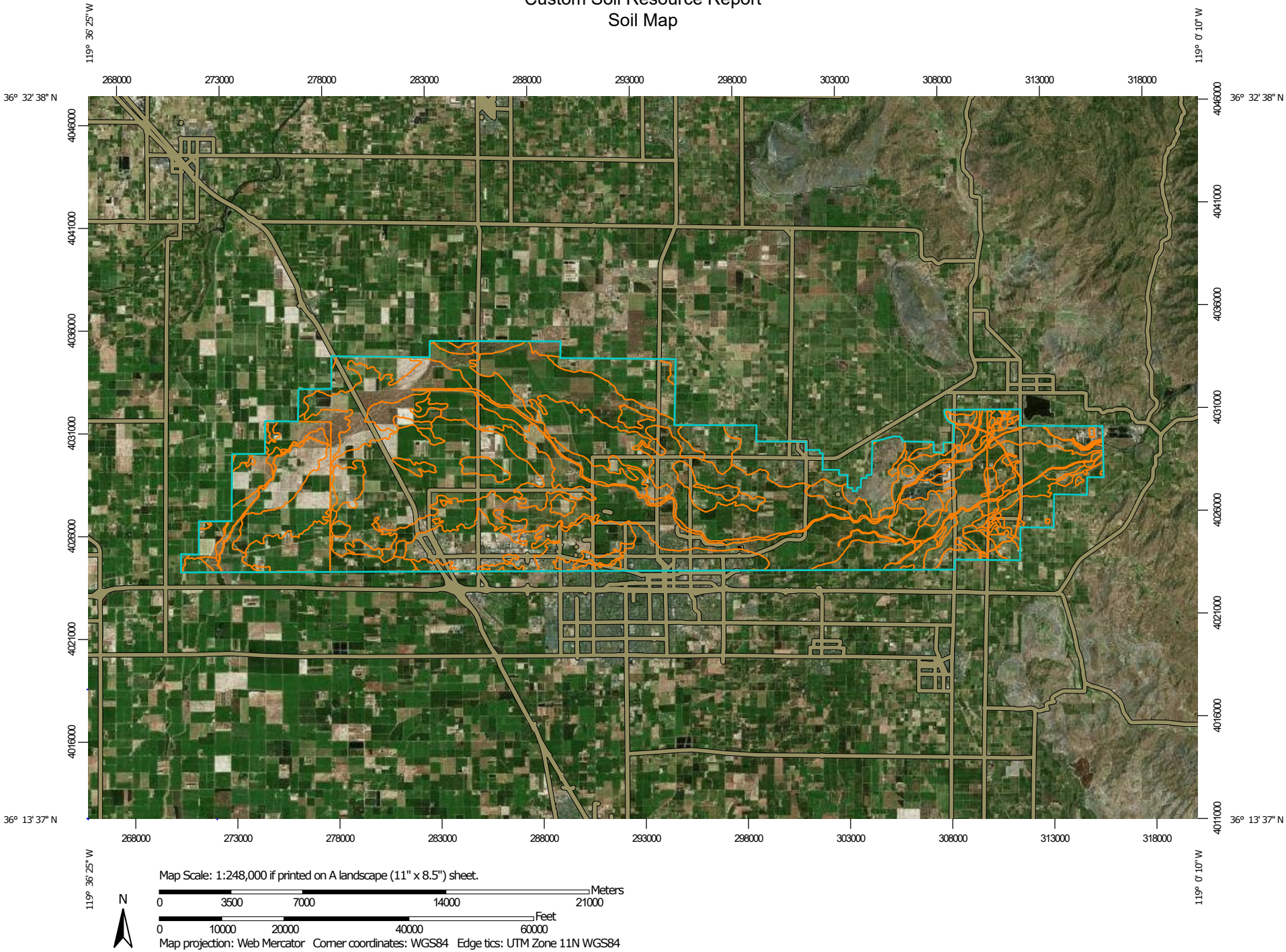
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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 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: Kings County, California
Survey Area Data: Version 20, Aug 30, 2024

Soil Survey Area: Tulare County, California, Central Part
Survey Area Data: Version 18, Aug 30, 2024

Soil Survey Area: Tulare County, Western Part, California
Survey Area Data: Version 18, Aug 30, 2024

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 1, 1999—Dec 31, 2003

MAP LEGEND

MAP INFORMATION

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
101tw	Akers-Akers, saline-Sodic, complex, 0 to 2 percent slopes	5.1	0.0%
108tw	Colpien loam, 0 to 2 percent slopes	1,856.7	2.2%
112	Excelsior sandy loam	283.0	0.3%
130	Kimberlina fine sandy loam, saline-alkali	87.5	0.1%
135	Lakeside clay loam, drained	100.7	0.1%
140	Melga silt loam	2,580.6	3.0%
158	Remnoy very fine sandy loam	2,944.0	3.5%
174	Wasco sandy loam, 0 to 5 percent slopes	18.7	0.0%
178	Westhaven clay loam, saline-alkali, 0 to 2 percent slop es	47.2	0.1%
180	Youd fine sandy loam	1,291.7	1.5%
181	Water	75.6	0.1%
Subtotals for Soil Survey Area		**9,290.9**	**10.9%**
Totals for Area of Interest		**85,095.5**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
106	Blasingame sandy loam, 15 to 30 percent slopes	6.7	0.0%
122tw	Grangeville sandy loam, drained, 0 to 2 percent slopes	342.1	0.4%
124	Exeter loam, 0 to 2 percent slopes	118.9	0.1%
124tw	Hanford sandy loam, 0 to 2 percent slopes	20.5	0.0%
131	Grangeville silt loam, drained	1,865.2	2.2%
134	Havala loam, 0 to 2 percent slopes	89.1	0.1%
138tw	Tujunga loamy sand, 0 to 2 percent slopes	134.7	0.2%
146	Pits	25.7	0.0%
151	Riverwash	113.9	0.1%
153	San Emigdio loam	61.5	0.1%
154	San Joaquin loam, 0 to 2 percent slopes	1,653.7	1.9%
155	San Joaquin loam, 2 to 9 percent slopes	273.9	0.3%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
164	Tujunga sand	1,703.3	2.0%
176	Yettem sandy loam, 0 to 2 percent slopes	143.2	0.2%
W	Water	179.9	0.2%
Subtotals for Soil Survey Area		**6,732.3**	**7.9%**
Totals for Area of Interest		**85,095.5**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
101	Akers-Akers, saline-Sodic, complex, 0 to 2 percent slopes	6,337.5	7.4%
105	Calgro-Calgro, saline-Sodic, complex, 0 to 2 percent slopes	9,720.6	11.4%
107	Centerville clay, 2 to 5 percent slopes	79.9	0.1%
108	Colpien loam, 0 to 2 percent slopes	994.4	1.2%
109	Crosscreek-Kai association, 0 to 2 percent slopes	10,970.9	12.9%
114	Exeter loam, 0 to 2 percent slopes	3,777.8	4.4%
116	Flamen loam, 0 to 2 percent slopes	4,576.2	5.4%
122	Grangeville sandy loam, drained, 0 to 2 percent slopes	17,369.2	20.4%
124	Hanford sandy loam, 0 to 2 percent slopes	16.3	0.0%
130	Nord fine sandy loam, 0 to 2 percent slopes	4,209.3	4.9%
132	Quonal-Lewis association, 0 to 2 percent slopes	568.5	0.7%
133	Remnoy silt loam, 0 to 2 percent slopes	2,536.7	3.0%
134	Riverwash	956.7	1.1%
135	San Joaquin loam, 0 to 2 percent slopes	439.8	0.5%
137	Tagus loam, 0 to 2 percent slopes	2,752.4	3.2%
138	Tujunga loamy sand, 0 to 2 percent slopes	604.3	0.7%
142	Wutchumna-Rock outcrop association, 5 to 50 percent slopes	1,765.6	2.1%
143	Yettem sandy loam, 0 to 2 percent slopes	395.3	0.5%
144	Youd loam, 0 to 1 percent slopes	960.7	1.1%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
145	Water-perennial	39.0	0.0%
Subtotals for Soil Survey Area		**69,071.1**	**81.2%**
Totals for Area of Interest		**85,095.5**	**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.

Kings County, California

101tw—Akers-Akers, saline-Sodic, complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 1r40p
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
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 content: 10 percent
Gypsum, maximum content: 2 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Ecological site: R017XY907CA - Aridic Alkali Desert
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
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 content: 10 percent
Gypsum, maximum content: 2 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 30.0
Available water supply, 0 to 60 inches: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Minor Components

Colpien

Percent of map unit: 3 percent
Landform: Fan remnants
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Tujunga

Percent of map unit: 3 percent
Landform: Flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Grangeville

Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Tagus
Percent of map unit: 2 percent
Landform: Fan remnants
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Hanford
Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Yettem
Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Unnamed, ponded
Percent of map unit: 1 percent
Landform: Depressions
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

108tw—Colpien loam, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: 1r40s
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
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 content: 5 percent
Maximum salinity: Nonsaline to slightly saline (0.5 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: High (about 10.7 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: C
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Biggriz

Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Hanford

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Gambogy

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Nord

Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Akers, saline-sodic

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

112—Excelsior sandy loam

Map Unit Setting

National map unit symbol: hhhx
Elevation: 200 to 280 feet
Mean annual precipitation: 5 to 8 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 240 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Excelsior and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Excelsior

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

Ap - 0 to 8 inches: sandy loam
C - 8 to 26 inches: stratified loamy sand to sandy loam
2C - 26 to 60 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Very slightly saline to strongly saline (2.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 80.0
Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C

Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Minor Components

Melga
Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Garces
Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Remnoy
Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Youd
Percent of map unit: 2 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Unnamed, rare flooding
Percent of map unit: 1 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Unnamed, rare flooding
Percent of map unit: 1 percent
Landform: Sloughs
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Nord
Percent of map unit: 1 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Kimberlina
Percent of map unit: 1 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

130—Kimberlina fine sandy loam, saline-alkali

Map Unit Setting
National map unit symbol: hhjh
Elevation: 190 to 3,500 feet
Mean annual precipitation: 4 to 8 inches
Mean annual air temperature: 61 to 64 degrees F

Frost-free period: 210 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Kimberlina and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kimberlina

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

Ap - 0 to 8 inches: fine sandy loam
C - 8 to 60 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 25.0
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Wasco

Percent of map unit: 2 percent
Hydric soil rating: No

Nord

Percent of map unit: 2 percent
Hydric soil rating: No

Excelsior

Percent of map unit: 2 percent
Hydric soil rating: No

Kimberlina, sandy substratum
Percent of map unit: 2 percent
Hydric soil rating: No

Garces
Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, rare flooding
Percent of map unit: 1 percent
Hydric soil rating: No

Cajon
Percent of map unit: 1 percent
Hydric soil rating: No

Melga
Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, rare flooding
Percent of map unit: 1 percent
Landform: Sloughs
Hydric soil rating: Yes

Yound
Percent of map unit: 1 percent
Hydric soil rating: No

Remnoy
Percent of map unit: 1 percent
Hydric soil rating: No

135—Lakeside clay loam, drained

Map Unit Setting
National map unit symbol: hhjn
Elevation: 170 to 260 feet
Mean annual precipitation: 8 inches
Mean annual air temperature: 64 degrees F
Frost-free period: 260 to 275 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Lakeside and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lakeside

Setting
Landform: Rims on basin floors

Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

Ap - 0 to 17 inches: loam
Czg - 17 to 60 inches: stratified sandy loam to clay

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 35.0
Available water supply, 0 to 60 inches: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: C
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Minor Components

Excelsior

Percent of map unit: 4 percent
Hydric soil rating: No

Grangeville

Percent of map unit: 3 percent
Landform: Alluvial fans
Hydric soil rating: Yes

Garces

Percent of map unit: 2 percent
Hydric soil rating: No

Corona

Percent of map unit: 2 percent
Hydric soil rating: No

Kimberlina

Percent of map unit: 2 percent
Hydric soil rating: No

Melga

Percent of map unit: 2 percent
Hydric soil rating: No

140—Melga silt loam

Map Unit Setting

National map unit symbol: hhjt
Elevation: 220 to 280 feet
Mean annual precipitation: 2 inches
Mean annual air temperature: 63 degrees F
Frost-free period: 250 to 275 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Melga and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Melga

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

A - 0 to 4 inches: silt loam
Btk - 4 to 18 inches: silty clay loam
Ck - 18 to 26 inches: clay loam
2C - 26 to 60 inches: stratified fine sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 10 to 20 inches to duripan
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 70.0
Available water supply, 0 to 60 inches: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: D

Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Minor Components

Remnoy
Percent of map unit: 2 percent
Hydric soil rating: No

Corona
Percent of map unit: 2 percent
Hydric soil rating: No

Garces
Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed, rare flooding
Percent of map unit: 2 percent
Hydric soil rating: No

Excelsior
Percent of map unit: 2 percent
Hydric soil rating: No

Youd
Percent of map unit: 2 percent
Hydric soil rating: No

Lakeside
Percent of map unit: 1 percent
Landform: Rims
Hydric soil rating: Yes

Unnamed, rare flooding
Percent of map unit: 1 percent
Landform: Sloughs
Hydric soil rating: Yes

Kimberlina
Percent of map unit: 1 percent
Hydric soil rating: No

158—Remnoy very fine sandy loam

Map Unit Setting
National map unit symbol: hhkd
Elevation: 190 to 300 feet
Mean annual precipitation: 7 to 8 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 250 to 275 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Remnoy and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Remnoy

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

A - 0 to 5 inches: very fine sandy loam
Bt - 5 to 15 inches: clay loam
Ckqm - 15 to 29 inches: indurated
2C - 29 to 70 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 10 to 20 inches to duripan
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 100.0
Available water supply, 0 to 60 inches: Very low (about 1.6 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Minor Components

Melga

Percent of map unit: 2 percent
Hydric soil rating: No

Remnoy, not flooded

Percent of map unit: 2 percent
Hydric soil rating: No

Kimberlina

Percent of map unit: 2 percent
Hydric soil rating: No

Lakeside
Percent of map unit: 2 percent
Landform: Rims
Hydric soil rating: Yes

Excelsior
Percent of map unit: 2 percent
Hydric soil rating: No

Nord
Percent of map unit: 2 percent
Hydric soil rating: No

Garces
Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed, rare flooding
Percent of map unit: 1 percent
Landform: Sloughs
Hydric soil rating: Yes

174—Wasco sandy loam, 0 to 5 percent slopes

Map Unit Setting
National map unit symbol: hhkx
Elevation: 250 to 3,700 feet
Mean annual precipitation: 4 to 7 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 210 to 275 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition
Wasco and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wasco

Setting
Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sandstone

Typical profile
A - 0 to 20 inches: sandy loam
C - 20 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Kettleman

Percent of map unit: 3 percent
Hydric soil rating: No

Kimberlina

Percent of map unit: 3 percent
Hydric soil rating: No

Cantua

Percent of map unit: 3 percent
Hydric soil rating: No

Avenal

Percent of map unit: 2 percent
Hydric soil rating: No

Cajon

Percent of map unit: 2 percent
Hydric soil rating: No

Panoche

Percent of map unit: 2 percent
Hydric soil rating: No

178—Westhaven clay loam, saline-alkali, 0 to 2 percent slop es

Map Unit Setting

National map unit symbol: hhl1
Elevation: 200 to 400 feet

Mean annual precipitation: 6 to 8 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 240 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Westhaven and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Westhaven

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

Ap - 0 to 10 inches: clay loam
C - 10 to 40 inches: stratified fine sandy loam to clay
2C - 40 to 60 inches: stratified silty clay loam to silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Minor Components

Excelsior

Percent of map unit: 4 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Lethent

Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Westcamp

Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Westhaven, loam

Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Unnamed, rare flooding

Percent of map unit: 2 percent
Landform: Sloughs
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

180—Youd fine sandy loam

Map Unit Setting

National map unit symbol: hhl3
Elevation: 220 to 300 feet
Mean annual precipitation: 7 to 8 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 250 to 275 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Youd and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Youd

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

Ap - 0 to 10 inches: fine sandy loam
Ctk - 10 to 26 inches: cemented
2C - 26 to 60 inches: stratified sand to silt loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 8 to 20 inches to duripan
Drainage class: Somewhat poorly drained
Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Maximum salinity: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 0.9 inches)

Interpretive groups
Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Minor Components

Youd, not flooded
Percent of map unit: 4 percent
Landform: Flood plains
Hydric soil rating: Yes

Melga
Percent of map unit: 3 percent
Hydric soil rating: No

Excelsior
Percent of map unit: 3 percent
Hydric soil rating: No

Remnoy
Percent of map unit: 2 percent
Hydric soil rating: No

Nord
Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, rare flooding
Percent of map unit: 1 percent
Landform: Sloughs
Hydric soil rating: Yes

Kimberlina
Percent of map unit: 1 percent
Hydric soil rating: No

181—Water

Map Unit Composition
Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Water

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: Unranked

Tulare County, California, Central Part

106—Blasingame sandy loam, 15 to 30 percent slopes

Map Unit Setting

National map unit symbol: hkcx
Elevation: 500 to 3,500 feet
Mean annual precipitation: 12 to 32 inches
Mean annual air temperature: 55 to 62 degrees F
Frost-free period: 150 to 280 days
Farmland classification: Not prime farmland

Map Unit Composition

Blasingame and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blasingame

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Quartz residuum weathered from diorite

Typical profile

A - 0 to 7 inches: sandy loam
Bt - 7 to 36 inches: sandy clay loam
Cr - 36 to 60 inches: bedrock

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low (0.01 to 0.14 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F018XC201CA - Thermic Granitic Foothills
Hydric soil rating: No

Minor Components

Auberry

Percent of map unit: 4 percent
Landform: Hills

Hydric soil rating: No

Cieneba

Percent of map unit: 4 percent
Landform: Hills
Hydric soil rating: No

Fallbrook

Percent of map unit: 4 percent
Landform: Hills
Hydric soil rating: No

Vista

Percent of map unit: 4 percent
Landform: Hills
Hydric soil rating: No

Unnamed, finer subsoil

Percent of map unit: 2 percent
Landform: Hills
Hydric soil rating: No

Unnamed, bouldery

Percent of map unit: 2 percent
Landform: Hills
Hydric soil rating: No

122tw—Grangeville sandy loam, drained, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2dg46
Elevation: 190 to 400 feet
Mean annual precipitation: 8 to 12 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 250 to 275 days
Farmland classification: Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Grangeville and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Grangeville

Setting

Landform: Alluvial fans, flood plains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Convex, linear
Parent material: Alluvium derived from granitic rock sources

Typical profile

Ap - 0 to 16 inches: sandy loam
Bg - 16 to 27 inches: sandy loam
2C - 27 to 67 inches: stratified loamy sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly 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: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: A
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: Yes

Minor Components

Yettem

Percent of map unit: 3 percent
Landform: Flood plains, alluvial fans
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Tujunga

Percent of map unit: 3 percent
Landform: Flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Grangeville, saline-sodic

Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: Yes

Nord

Percent of map unit: 1 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Hanford

Percent of map unit: 1 percent
Landform: Alluvial fans, flood plains

Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

124—Exeter loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hkdh
Elevation: 20 to 700 feet
Mean annual precipitation: 7 to 20 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 250 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Exeter and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Exeter

Setting

Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granitoid

Typical profile

Ap - 0 to 14 inches: loam
Bt - 14 to 30 inches: sandy clay loam
Cqm - 30 to 43 inches: duripan
C1 - 43 to 47 inches: gravelly sand
C2 - 47 to 60 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to duripan
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 4s

Hydrologic Soil Group: C
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Minor Components

San joaquin
Percent of map unit: 7 percent
Hydric soil rating: No

Wyman
Percent of map unit: 7 percent
Hydric soil rating: No

Unnamed, brown subsoil
Percent of map unit: 7 percent
Hydric soil rating: No

Unnamed, ponded
Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

124tw—Hanford sandy loam, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: 2dg47
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: Alluvial fans, flood plains
Landform position (two-dimensional): Footslope, toeslope
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
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 content: 2 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 7.0
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 3c
Hydrologic Soil Group: A
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Exeter

Percent of map unit: 5 percent
Landform: Fan remnants
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Tujunga

Percent of map unit: 5 percent
Landform: Flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Calgro

Percent of map unit: 3 percent
Landform: Fan remnants
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Yettem

Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

131—Grangeville silt loam, drained

Map Unit Setting

National map unit symbol: hkdq
Elevation: 0 to 1,800 feet
Mean annual precipitation: 7 to 16 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 200 to 300 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Grangeville and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Grangeville

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granitoid

Typical profile

A - 0 to 14 inches: silt loam
C - 14 to 64 inches: stratified loamy sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Ecological site: R017XE061CA - Loamy Fan Remnant 8-10" P.Z.
Hydric soil rating: Yes

Minor Components

Unnamed
Percent of map unit: 2 percent
Landform: Drainageways
Hydric soil rating: Yes

San emigdio
Percent of map unit: 2 percent
Hydric soil rating: No

Tujunga
Percent of map unit: 2 percent
Hydric soil rating: No

Yettem
Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed, compacted
Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, silt loam surface
Percent of map unit: 1 percent
Hydric soil rating: No

134—Havala loam, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: hkdt
Elevation: 1,500 to 4,300 feet
Mean annual precipitation: 9 to 12 inches
Mean annual air temperature: 57 to 63 degrees F
Frost-free period: 175 to 225 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition
Havala and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Havala

Setting
Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granitoid

Typical profile

A - 0 to 16 inches: loam
Bt - 16 to 45 inches: sandy clay loam
C - 45 to 64 inches: sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: C
Ecological site: R017XY905CA - Dry Alluvial Fans and Terraces
Hydric soil rating: No

Minor Components

Honcut

Percent of map unit: 4 percent
Hydric soil rating: No

Wyman

Percent of map unit: 4 percent
Hydric soil rating: No

Yettem

Percent of map unit: 4 percent
Hydric soil rating: No

Unnamed, steeper slopes

Percent of map unit: 3 percent
Hydric soil rating: No

138tw—Tujunga loamy sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2dg4c
Elevation: 210 to 520 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 250 to 300 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Tujunga and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tujunga

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

Ap - 0 to 14 inches: loamy sand
C - 14 to 70 inches: stratified coarse sand to loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R017XY903CA - Stream Channels and Floodplains
Hydric soil rating: No

Minor Components

Grangeville

Percent of map unit: 5 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: Yes

Yettem

Percent of map unit: 4 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Akers, saline-sodic

Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Akers
Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

146—Pits

Map Unit Composition
Pits: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pits

Setting
Microfeatures of landform position: Open depressions
Down-slope shape: Linear
Across-slope shape: Linear

Interpretive groups
Land capability classification (irrigated): 8
Land capability classification (nonirrigated): 8
Hydric soil rating: No

Minor Components

Water
Percent of map unit: 10 percent
Hydric soil rating: No

151—Riverwash

Map Unit Composition
Riverwash: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Riverwash

Setting
Landform: Channels
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear

Interpretive groups

Land capability classification (irrigated): 8
Land capability classification (nonirrigated): 8
Hydric soil rating: Yes

Minor Components

Honcut

Percent of map unit: 3 percent
Hydric soil rating: No

Tujunga

Percent of map unit: 2 percent
Hydric soil rating: No

153—San Emigdio loam

Map Unit Setting

National map unit symbol: hkff
Elevation: 430 to 690 feet
Mean annual precipitation: 11 to 16 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 320 to 325 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

San emigdio and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of San Emigdio

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granitoid and/or alluvium derived from sedimentary rock

Typical profile

Ap - 0 to 29 inches: loam
C - 29 to 66 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: A
Ecological site: R017XE118CA - CALCAREOUS LOAMY
Hydric soil rating: No

Minor Components

Honcut

Percent of map unit: 2 percent
Hydric soil rating: No

Tujunga

Percent of map unit: 2 percent
Hydric soil rating: No

Wyman

Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed, salty

Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed, finer subsoil

Percent of map unit: 2 percent
Hydric soil rating: No

154—San Joaquin loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hkfg
Elevation: 20 to 500 feet
Mean annual precipitation: 10 to 22 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 250 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

San joaquin and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of San Joaquin

Setting

Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from acid igneous rock

Typical profile

Ap - 0 to 13 inches: loam
B - 13 to 20 inches: sandy clay loam
Bt - 20 to 25 inches: clay
Cqm - 25 to 56 inches: duripan
C - 56 to 78 inches: stratified sandy loam to loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches; 20 to 40 inches to duripan
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Minor Components

Exeter

Percent of map unit: 6 percent
Hydric soil rating: No

Unnamed, brown subsoil

Percent of map unit: 6 percent
Hydric soil rating: No

Unnamed, shallow

Percent of map unit: 6 percent
Hydric soil rating: No

Wyman

Percent of map unit: 6 percent
Hydric soil rating: No

Unnamed, ponded

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

155—San Joaquin loam, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: hkfh
Elevation: 20 to 500 feet
Mean annual precipitation: 10 to 22 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 250 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

San joaquin and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of San Joaquin

Setting

Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from acid igneous rock

Typical profile

Ap - 0 to 13 inches: loam
B - 13 to 20 inches: sandy clay loam
Bt - 20 to 25 inches: clay
Cqm - 25 to 56 inches: duripan
C - 56 to 78 inches: stratified sandy loam to loam

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches; 20 to 40 inches to duripan
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: R017XE061CA - Loamy Fan Remnant 8-10" P.Z.
Hydric soil rating: No

Minor Components

Exeter
Percent of map unit: 7 percent
Hydric soil rating: No

Unnamed, brown subsoil
Percent of map unit: 6 percent
Hydric soil rating: No

Wyman
Percent of map unit: 6 percent
Hydric soil rating: No

Unnamed, ponded
Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

164—Tujunga sand

Map Unit Setting
National map unit symbol: hkfs
Elevation: 10 to 2,500 feet
Mean annual precipitation: 10 to 25 inches
Mean annual air temperature: 59 to 64 degrees F
Frost-free period: 280 to 350 days
Farmland classification: Not prime farmland

Map Unit Composition
Tujunga and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tujunga

Setting
Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granitoid

Typical profile
A - 0 to 16 inches: sand
C - 16 to 60 inches: loamy sand

Properties and qualities
Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: R017XE080CA - SANDY
Hydric soil rating: No

Minor Components

Honcut

Percent of map unit: 4 percent
Hydric soil rating: No

San emigdio

Percent of map unit: 3 percent
Hydric soil rating: No

Unnamed, calcareous

Percent of map unit: 3 percent
Hydric soil rating: No

176—Yettem sandy loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hkg5
Elevation: 300 to 1,500 feet
Mean annual precipitation: 10 to 16 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 250 to 300 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Yettem and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Yettem

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear

Across-slope shape: Linear
Parent material: Alluvium derived from granitoid

Typical profile

A - 0 to 26 inches: sandy loam
C - 26 to 70 inches: sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Minor Components

Grangeville

Percent of map unit: 3 percent
Landform: Alluvial fans
Hydric soil rating: Yes

Havala

Percent of map unit: 3 percent
Hydric soil rating: No

San emigdio

Percent of map unit: 3 percent
Hydric soil rating: No

Tujunga

Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed

Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed, clayey substratum

Percent of map unit: 2 percent
Hydric soil rating: No

W—Water

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Water

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: Unranked

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
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 content: 10 percent
Gypsum, maximum content: 2 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Ecological site: R017XY907CA - Aridic Alkali Desert
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
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 content: 10 percent
Gypsum, maximum content: 2 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 30.0
Available water supply, 0 to 60 inches: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Minor Components

Tujunga

Percent of map unit: 3 percent
Landform: Flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Colpien

Percent of map unit: 3 percent
Landform: Fan remnants
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Yettem

Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Tagus

Percent of map unit: 2 percent
Landform: Fan remnants
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Grangeville

Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Hanford

Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Unnamed, ponded

Percent of map unit: 1 percent
Landform: Depressions
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

105—Calgro-Calgro, saline-Sodic, complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hp47
Elevation: 250 to 480 feet
Mean annual precipitation: 8 to 12 inches
Mean annual air temperature: 62 to 65 degrees F
Frost-free period: 250 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Calgro and similar soils: 60 percent
Calgro, saline-sodic, and similar soils: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Calgro

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 granite

Typical profile

Ap - 0 to 7 inches: sandy loam
Bw - 7 to 25 inches: sandy loam
2Bkqm - 25 to 33 inches: cemented
2Bkq - 33 to 53 inches: gravelly loamy sand
3Bkqm - 53 to 60 inches: cemented

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to duripan
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Description of Calgro, 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 granite

Typical profile

Ap - 0 to 8 inches: sandy loam
Bw - 8 to 24 inches: sandy loam
2Bkqm - 24 to 33 inches: cemented
2Bkq - 33 to 52 inches: gravelly loamy sand
3Bkqm - 52 to 60 inches: cemented

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to duripan
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None

Calcium carbonate, maximum content: 4 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 100.0
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Minor Components

Colpien

Percent of map unit: 5 percent
Landform: Fan remnants
Hydric soil rating: No

Grangeville

Percent of map unit: 4 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Tujunga

Percent of map unit: 3 percent
Landform: Flood plains
Hydric soil rating: No

Exeter

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

107—Centerville clay, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: hp49
Elevation: 300 to 600 feet
Mean annual precipitation: 9 to 12 inches
Mean annual air temperature: 59 to 64 degrees F
Frost-free period: 250 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Centerville and similar soils: 90 percent

Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Centerville

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 granitoid

Typical profile

A - 0 to 7 inches: clay
Bss - 7 to 48 inches: sandy clay
Btdkss - 48 to 60 inches: gravelly sandy clay loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: 48 to 60 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to moderately saline (0.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 40.0
Available water supply, 0 to 60 inches: Moderate (about 6.7 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: R017XY905CA - Dry Alluvial Fans and Terraces
Hydric soil rating: No

Minor Components

Exeter

Percent of map unit: 7 percent
Landform: Fan remnants
Hydric soil rating: No

San joaquin

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
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 content: 5 percent
Maximum salinity: Nonsaline to slightly saline (0.5 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: High (about 10.7 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c

Hydrologic Soil Group: C
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Hanford
Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Biggriz
Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Gambogy
Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
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: Alluvial fans, flood plains
Hydric soil rating: No

Akers, saline-sodic
Percent of map unit: 2 percent
Landform: Fan remnants
Hydric soil rating: No

109—Crosscreek-Kai association, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: hp4c
Elevation: 230 to 400 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: Farmland of statewide importance

Map Unit Composition
Crosscreek and similar soils: 70 percent
Kai and similar soils: 15 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Crosscreek

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: Formed by the chemical and mechanical alteration of the kai series which originally formed in alluvium derived from granitic rock

Typical profile

Ap1 - 0 to 11 inches: loam
Ap2 - 11 to 17 inches: gravelly loam
Ap3 - 17 to 55 inches: sandy loam
2Bkqmb - 55 to 60 inches: cemented

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 40 to 60 inches to duripan
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.01 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Gypsum, maximum content: 5 percent
Maximum salinity: Nonsaline to moderately saline (1.0 to 12.0 mmhos/cm)
Sodium adsorption ratio, maximum: 13.0
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Description of Kai

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

A - 0 to 6 inches: loam
Btkn - 6 to 39 inches: loam
Bkqm - 39 to 46 inches: cemented
Btq - 46 to 65 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 4 to 12 inches to natric; 20 to 40 inches to duripan
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.01 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Nonsaline to strongly saline (1.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 80.0
Available water supply, 0 to 60 inches: Very low (about 0.9 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Quonal

Percent of map unit: 5 percent
Landform: Fan remnants
Hydric soil rating: No

Exeter

Percent of map unit: 4 percent
Landform: Fan remnants
Hydric soil rating: No

Calgro, saline-sodic

Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Hanford

Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Unnamed, ponded

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

114—Exeter loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hp4j
Elevation: 250 to 570 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: Farmland of statewide importance

Map Unit Composition

Exeter, 0-2% slopes, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Exeter, 0-2% Slopes

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 9 inches: loam
Bt1 - 9 to 26 inches: sandy clay loam
Bt2 - 26 to 28 inches: clay loam
Btqm - 28 to 46 inches: indurated
2Bt - 46 to 72 inches: stratified very gravelly loamy coarse sand to gravelly loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to duripan
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.01 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 4s

Hydrologic Soil Group: C
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Minor Components

Hanford
Percent of map unit: 4 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Colpien
Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

San joaquin
Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Quonal
Percent of map unit: 2 percent
Landform: Fan remnants
Hydric soil rating: No

Calgro
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

116—Flamen loam, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: hp4l
Elevation: 260 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
Flamen and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Flamen

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

Ap1 - 0 to 17 inches: loam
Ap2 - 17 to 28 inches: loam
Btk - 28 to 43 inches: loam
2Btkqm - 43 to 72 inches: cemented

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 40 to 60 inches to duripan
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Minor Components

Exeter

Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

San joaquin

Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Hanford

Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Calgro

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

Centerville

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

122—Grangeville sandy loam, drained, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hp4s
Elevation: 190 to 400 feet
Mean annual precipitation: 8 to 12 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 250 to 275 days
Farmland classification: Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Grangeville and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Grangeville

Setting

Landform: Alluvial fans, flood plains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Convex, linear
Parent material: Alluvium derived from granitic rock sources

Typical profile

Ap - 0 to 16 inches: sandy loam
Bg - 16 to 27 inches: sandy loam
2C - 27 to 67 inches: stratified loamy sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat poorly 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: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: A
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: Yes

Minor Components

Yettem

Percent of map unit: 3 percent
Landform: Flood plains, alluvial fans
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Tujunga

Percent of map unit: 3 percent
Landform: Flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Grangeville, saline-sodic

Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: Yes

Nord

Percent of map unit: 1 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Hanford

Percent of map unit: 1 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY904CA - Subirrigated Deep 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: Alluvial fans, flood plains
Landform position (two-dimensional): Footslope, toeslope
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
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 content: 2 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 7.0
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 3c
Hydrologic Soil Group: A

Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Exeter
Percent of map unit: 5 percent
Landform: Fan remnants
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Tujunga
Percent of map unit: 5 percent
Landform: Flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Calgro
Percent of map unit: 3 percent
Landform: Fan remnants
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Yettem
Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

130—Nord fine sandy loam, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: hp51
Elevation: 190 to 520 feet
Mean annual precipitation: 8 to 12 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 250 to 275 days
Farmland classification: Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition
Nord and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nord

Setting
Landform: Alluvial fans, flood plains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope

Down-slope shape: Linear
Across-slope shape: Convex, linear
Parent material: Alluvium derived from mixed

Typical profile

Ap - 0 to 11 inches: fine sandy loam
C1 - 11 to 38 inches: stratified sandy loam to loam
C2 - 38 to 50 inches: stratified loamy coarse sand to coarse sandy loam
2Btb - 50 to 72 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches; More than 80 inches
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 content: 4 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 10.0
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Grangeville, saline-sodic

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: Yes

Hanford

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Tujunga

Percent of map unit: 3 percent
Landform: Flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Tagus

Percent of map unit: 2 percent
Landform: Fan remnants
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Akers

Percent of map unit: 2 percent
Landform: Fan remnants
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Colpien

Percent of map unit: 2 percent
Landform: Fan remnants
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

132—Quonal-Lewis association, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hp53
Elevation: 280 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: Farmland of statewide importance

Map Unit Composition

Quonal and similar soils: 70 percent
Lewis and similar soils: 15 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Quonal

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: Formed by the chemical and mechanical alteration of the lewis series which originally formed in alluvium from mixed rock sources

Typical profile

Ap1 - 0 to 7 inches: silty clay
Ap2 - 7 to 16 inches: gravelly clay
Ap3 - 16 to 41 inches: gravelly clay
2Bkqmb - 41 to 44 inches: duripan
2Bkb - 44 to 62 inches: stratified sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 40 to 60 inches to duripan
Drainage class: Moderately well drained

Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.01 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Gypsum, maximum content: 5 percent
Maximum salinity: Nonsaline to moderately saline (0.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 50.0
Available water supply, 0 to 60 inches: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Description of Lewis

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 mixed

Typical profile

A - 0 to 5 inches: silty clay loam
Btkn - 5 to 25 inches: clay
2Bkqm - 25 to 39 inches: cemented
3Bkq - 39 to 60 inches: stratified sandy loam to clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 2 to 6 inches to natric; 20 to 40 inches to duripan
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.01 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum content: 8 percent
Maximum salinity: Moderately saline to strongly saline (8.0 to 40.0 mmhos/cm)
Sodium adsorption ratio, maximum: 100.0
Available water supply, 0 to 60 inches: Very low (about 0.9 inches)

Interpretive groups

Land capability classification (irrigated): 6s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Minor Components

Exeter
Percent of map unit: 4 percent
Landform: Fan remnants
Hydric soil rating: No

Colpien
Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Flamen
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

San joaquin
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

133—Remnoy silt loam, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: hp54
Elevation: 190 to 300 feet
Mean annual precipitation: 7 to 8 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 250 to 275 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Remnoy and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Remnoy

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 mixed

Typical profile

A - 0 to 3 inches: silt loam
Btn - 3 to 17 inches: clay loam
Bkqm - 17 to 23 inches: indurated
C - 23 to 60 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 2 to 9 inches to natric; 10 to 20 inches to duripan
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Gypsum, maximum content: 3 percent
Maximum salinity: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 100.0
Available water supply, 0 to 60 inches: Very low (about 0.3 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Youd

Percent of map unit: 5 percent
Landform: Fan remnants
Hydric soil rating: No

Calgro, saline-sodic

Percent of map unit: 4 percent
Landform: Fan remnants
Hydric soil rating: No

Quonal

Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Crosscreek
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
Ecological site: R017XY903CA - Stream Channels and Floodplains
Hydric soil rating: Yes

135—San Joaquin loam, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: hp56
Elevation: 300 to 490 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 250 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
San joaquin and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of San Joaquin

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 mixed

Typical profile

Ap - 0 to 10 inches: loam
Bt - 10 to 15 inches: sandy clay loam
2Bt - 15 to 29 inches: clay loam
2Bkqm - 29 to 39 inches: indurated

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches; 20 to 40 inches to duripan
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.01 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Very low (about 2.3 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: D
Ecological site: R017XY902CA - Duripan Vernal Pools
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

Colpien

Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Akers

Percent of map unit: 2 percent
Landform: Fan remnants
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
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 content: 10 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B

Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Minor Components

Tujunga
Percent of map unit: 5 percent
Landform: Flood plains
Hydric soil rating: No

Hanford
Percent of map unit: 5 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Grangeville
Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Colpien
Percent of map unit: 2 percent
Landform: Fan remnants
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

138—Tujunga loamy sand, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: hp59
Elevation: 210 to 520 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 250 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Tujunga and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tujunga

Setting
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

Ap - 0 to 14 inches: loamy sand
C - 14 to 70 inches: stratified coarse sand to loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R017XY903CA - Stream Channels and Floodplains
Hydric soil rating: No

Minor Components

Grangeville

Percent of map unit: 5 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: Yes

Yettem

Percent of map unit: 4 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Akers, saline-sodic

Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Akers

Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

142—Wutchumna-Rock outcrop association, 5 to 50 percent slopes

Map Unit Setting

National map unit symbol: hp5f
Elevation: 340 to 870 feet
Mean annual precipitation: 9 to 14 inches

Mean annual air temperature: 62 to 65 degrees F
Frost-free period: 175 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition

Wutchumna, 15-50% slopes, and similar soils: 55 percent
Minor components: 45 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wutchumna, 15-50% Slopes

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Colluvium derived from gabbro and/or residuum weathered from gabbro

Typical profile

A - 0 to 4 inches: gravelly clay loam
Bt1 - 4 to 18 inches: gravelly clay loam
Bt2 - 18 to 35 inches: gravelly clay
R - 35 to 45 inches: bedrock

Properties and qualities

Slope: 15 to 50 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: R018XC102CA - Steep Thermic Clayey Shallow
Hydric soil rating: No

Minor Components

Wutchumna, 5-15% slopes

Percent of map unit: 15 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Hydric soil rating: No

Rock outcrop
Percent of map unit: 15 percent
Landform: Hills
Hydric soil rating: No

Unnamed, clayey-skeletal
Percent of map unit: 10 percent
Landform: Hills
Hydric soil rating: No

Unnamed, fine
Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Toeslope
Down-slope shape: Concave
Hydric soil rating: No

143—Yettem sandy loam, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: hp5g
Elevation: 270 to 530 feet
Mean annual precipitation: 9 to 12 inches
Mean annual air temperature: 62 to 65 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
Yettem and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Yettem

Setting
Landform: Alluvial fans, flood plains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile
Ap - 0 to 13 inches: sandy loam
C - 13 to 63 inches: sandy loam

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained

Runoff class: Very low
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 content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 5.0
Available water supply, 0 to 60 inches: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: A
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Minor Components

Grangeville

Percent of map unit: 5 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: Yes

Kimberlina

Percent of map unit: 5 percent
Landform: Flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Colpien

Percent of map unit: 3 percent
Landform: Fan remnants
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Tujunga

Percent of map unit: 2 percent
Landform: Flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

144—Youd loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: hp5h
Elevation: 220 to 300 feet
Mean annual precipitation: 7 to 8 inches
Mean annual air temperature: 63 to 64 degrees F

Frost-free period: 250 to 275 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Youd and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Youd

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 9 inches: loam
Bkqm - 9 to 32 inches: cemented
Bkq - 32 to 60 inches: stratified sand to silt loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 8 to 20 inches to duripan
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Gypsum, maximum content: 3 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 50.0
Available water supply, 0 to 60 inches: Very low (about 0.8 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Minor Components

Crosscreek

Percent of map unit: 5 percent
Landform: Fan remnants
Hydric soil rating: No

Quonal

Percent of map unit: 4 percent
Landform: Fan remnants
Hydric soil rating: No

Remnoy

Percent of map unit: 3 percent
Landform: Fan remnants
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Tujunga

Percent of map unit: 2 percent
Landform: Flood plains
Hydric soil rating: Yes

Unnamed, ponded

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

145—Water-perennial

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Water

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: Unranked

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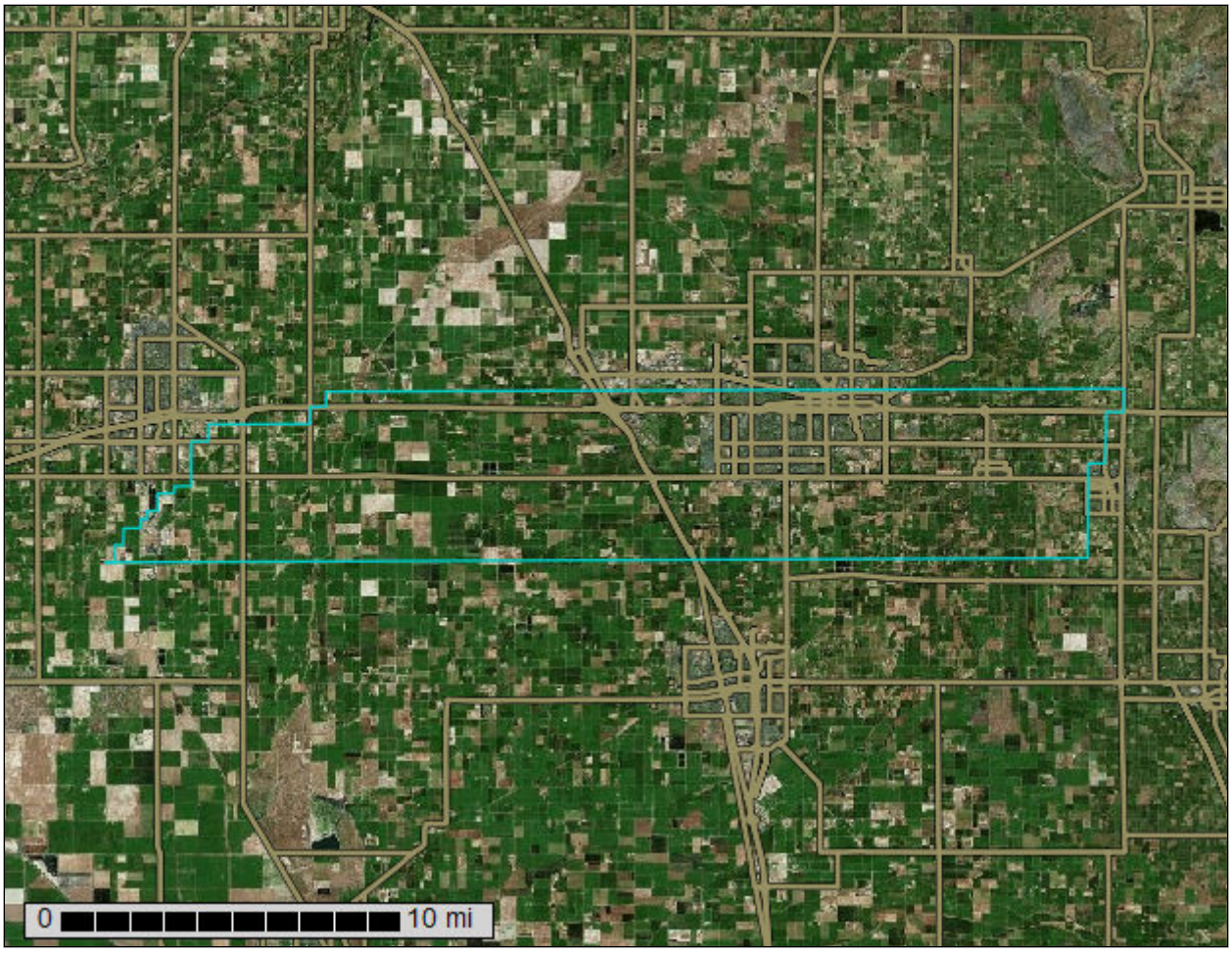
United States Department of Agriculture

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 Kings County, California; and Tulare County, Western Part, California



November 11, 2024

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.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

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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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.

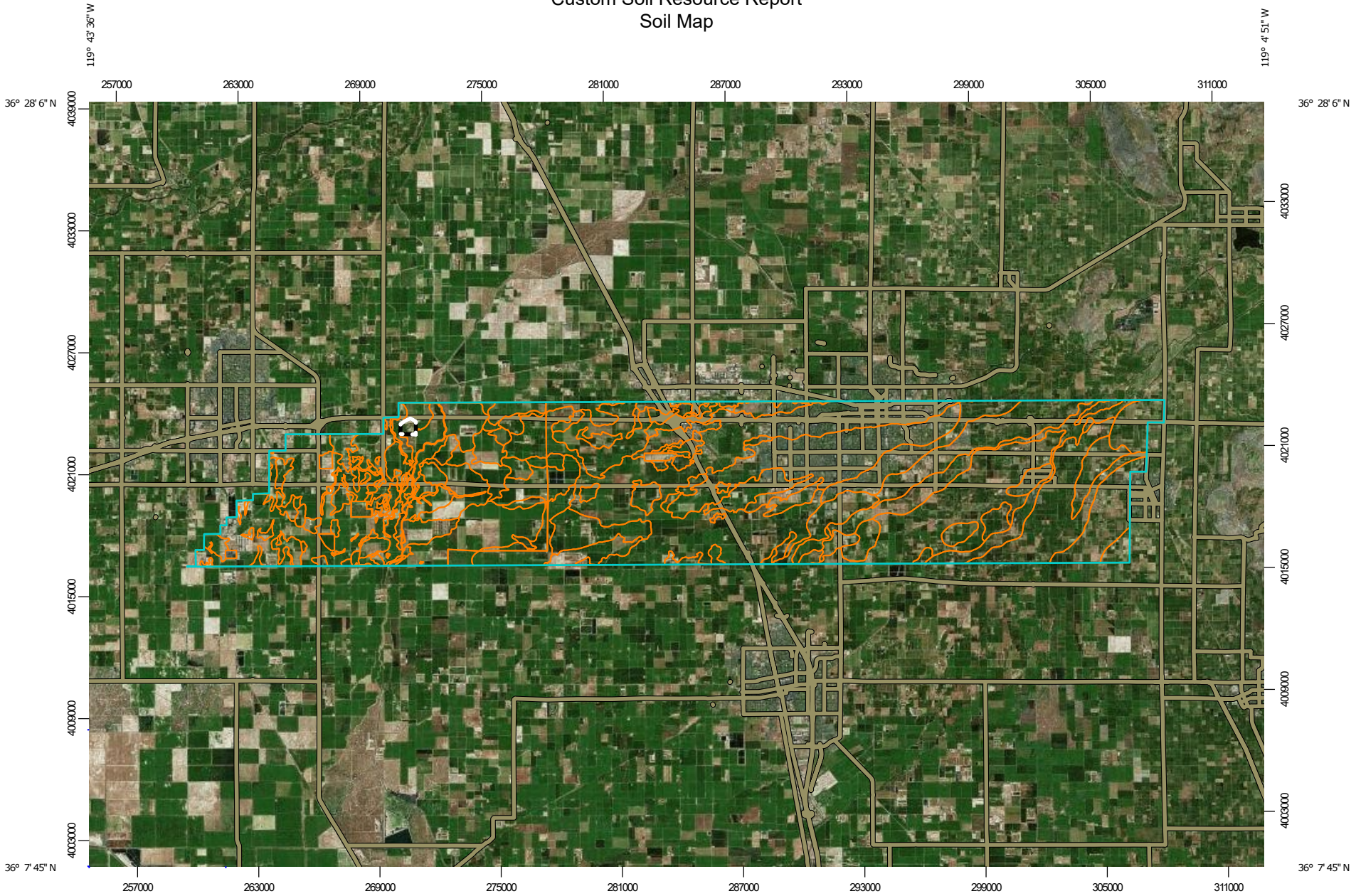
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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: 1:265,000 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 3500 7000 14000 21000

Feet
0 10000 20000 40000 60000

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: Kings County, California
Survey Area Data: Version 20, Aug 30, 2024

Soil Survey Area: Tulare County, Western Part, California
Survey Area Data: Version 18, Aug 30, 2024

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 1, 1999—Dec 31, 2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

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
101tw	Akers-Akers, saline-Sodic, complex, 0 to 2 percent slopes	737.4	0.9%
104	Cajon sandy loam	508.0	0.6%
108tw	Colpien loam, 0 to 2 percent slopes	920.5	1.1%
112	Excelsior sandy loam	1,981.7	2.3%
113	Garces loam	653.4	0.8%
117tw	Gambogy loam, drained, 0 to 1 percent slopes	2,700.5	3.2%
120	Grangeville fine sandy loam, partially drained	836.2	1.0%
121	Grangeville fine sandy loam, saline-alkali, partially d rained	529.6	0.6%
130	Kimberlina fine sandy loam, saline-alkali	8,421.8	9.9%
131	Kimberlina fine sandy loam, sandy substratum	109.5	0.1%
132	Kimberlina saline alkali-Garces complex	1,966.9	2.3%
135	Lakeside clay loam, drained	1,605.6	1.9%
140	Melga silt loam	1,176.5	1.4%
147	Nord fine sandy loam	184.6	0.2%
148	Nord fine sandy loam, saline-alkali	33.2	0.0%
149	Nord complex	106.7	0.1%
154	Pits and Dumps	145.9	0.2%
158	Remnoy very fine sandy loam	44.7	0.1%
167	Urban land	207.2	0.2%
174	Wasco sandy loam, 0 to 5 percent slopes	1,360.4	1.6%
178	Westhaven clay loam, saline-alkali, 0 to 2 percent slop es	1,538.1	1.8%
179	Whitewolf coarse sandy loam	3.3	0.0%
181	Water	382.5	0.4%
Subtotals for Soil Survey Area		**26,154.0**	**30.7%**
Totals for Area of Interest		**85,094.5**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
101	Akers-Akers, saline-Sodic, complex, 0 to 2 percent slopes	5,376.0	6.3%
108	Colpien loam, 0 to 2 percent slopes	2,542.6	3.0%
114	Exeter loam, 0 to 2 percent slopes	1,555.9	1.8%
116	Flamen loam, 0 to 2 percent slopes	3,216.2	3.8%
117	Gambogy loam, drained, 0 to 1 percent slopes	233.5	0.3%
122	Grangeville sandy loam, drained, 0 to 2 percent slopes	5,695.9	6.7%
130	Nord fine sandy loam, 0 to 2 percent slopes	26,177.5	30.8%
137	Tagus loam, 0 to 2 percent slopes	13,488.9	15.9%
143	Yettem sandy loam, 0 to 2 percent slopes	395.0	0.5%
145	Water-perennial	131.4	0.2%
Subtotals for Soil Survey Area		**58,812.9**	**69.1%**
Totals for Area of Interest		**85,094.5**	**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.

Kings County, California

101tw—Akers-Akers, saline-Sodic, complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 1r40p
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
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 content: 10 percent
Gypsum, maximum content: 2 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Ecological site: R017XY907CA - Aridic Alkali Desert
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
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 content: 10 percent
Gypsum, maximum content: 2 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 30.0
Available water supply, 0 to 60 inches: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Minor Components

Colpien

Percent of map unit: 3 percent
Landform: Fan remnants
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Tujunga

Percent of map unit: 3 percent
Landform: Flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Grangeville

Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Tagus

Percent of map unit: 2 percent
Landform: Fan remnants
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Hanford

Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Yettem

Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Unnamed, ponded

Percent of map unit: 1 percent
Landform: Depressions
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

104—Cajon sandy loam

Map Unit Setting

National map unit symbol: hhhn
Elevation: 320 to 400 feet
Mean annual precipitation: 5 to 7 inches
Mean annual air temperature: 61 to 70 degrees F
Frost-free period: 240 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Cajon and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cajon

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

Ap - 0 to 11 inches: sandy loam
C - 11 to 60 inches: loamy sand
2C - 60 to 70 inches: stratified sand to loamy fine sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Kimberlina

Percent of map unit: 4 percent
Hydric soil rating: No

Cajon, calcareous

Percent of map unit: 4 percent
Hydric soil rating: No

Nord

Percent of map unit: 3 percent
Hydric soil rating: No

Lemoore

Percent of map unit: 1 percent
Landform: Alluvial fans
Hydric soil rating: Yes

Wasco

Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, rare flooding

Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, rare flooding

Percent of map unit: 1 percent
Landform: Sloughs
Hydric soil rating: Yes

108tw—Colpien loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 1r40s
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
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 content: 5 percent
Maximum salinity: Nonsaline to slightly saline (0.5 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: High (about 10.7 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c

Hydrologic Soil Group: C
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Biggriz
Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Hanford
Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Gambogy
Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Nord
Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Akers, saline-sodic
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

112—Excelsior sandy loam

Map Unit Setting
National map unit symbol: hhhx
Elevation: 200 to 280 feet
Mean annual precipitation: 5 to 8 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 240 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Excelsior and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Excelsior

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

Ap - 0 to 8 inches: sandy loam
C - 8 to 26 inches: stratified loamy sand to sandy loam
2C - 26 to 60 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Very slightly saline to strongly saline (2.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 80.0
Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Minor Components

Melga

Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Garces

Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Remnoy

Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Youd

Percent of map unit: 2 percent
Ecological site: R017XY907CA - Aridic Alkali Desert

Hydric soil rating: No

Unnamed, rare flooding

Percent of map unit: 1 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Unnamed, rare flooding

Percent of map unit: 1 percent
Landform: Sloughs
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Nord

Percent of map unit: 1 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Kimberlina

Percent of map unit: 1 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

113—Garces loam

Map Unit Setting

National map unit symbol: hhhy
Elevation: 200 to 400 feet
Mean annual precipitation: 5 to 8 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 250 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Garces and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Garces

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

A - 0 to 9 inches: loam
Btk1 - 9 to 17 inches: clay loam
Btk2 - 17 to 22 inches: sandy clay loam

Ck - 22 to 60 inches: stratified sandy loam to clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 9 to 14 inches to natric
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 30.0
Available water supply, 0 to 60 inches: Very low (about 1.3 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R017XY905CA - Dry Alluvial Fans and Terraces
Hydric soil rating: No

Minor Components

Corona

Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Kimberlina

Percent of map unit: 2 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Excelsior

Percent of map unit: 2 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Goldberg

Percent of map unit: 2 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Wasco

Percent of map unit: 1 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Unnamed, rare flooding

Percent of map unit: 1 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Cajon

Percent of map unit: 1 percent
Ecological site: R017XY907CA - Aridic Alkali Desert

Hydric soil rating: No

Playas

Percent of map unit: 1 percent
Landform: Playas
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Unnamed, rare flooding

Percent of map unit: 1 percent
Landform: Sloughs
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Lakeside

Percent of map unit: 1 percent
Landform: Rims
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

117tw—Gambogy loam, drained, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2dg7y
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: Alluvial fans, flood plains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Convex, linear
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
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 content: 3 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Hanford

Percent of map unit: 3 percent
Landform: Alluvial fans, 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: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Yettem

Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
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: Alluvial fans, flood plains
Hydric soil rating: No

120—Grangeville fine sandy loam, partially drained

Map Unit Setting

National map unit symbol: hhj5
Elevation: 210 to 290 feet
Mean annual precipitation: 7 to 8 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 250 to 275 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Grangeville and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Grangeville

Setting

Landform: Flood plains, alluvial fans
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

A - 0 to 10 inches: fine sandy loam
C - 10 to 60 inches: stratified sandy loam to fine sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: A/D
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: Yes

Minor Components

Nord
Percent of map unit: 4 percent
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Vanguard
Percent of map unit: 3 percent
Landform: Flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: Yes

Kimberlina
Percent of map unit: 3 percent
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Whitewolf
Percent of map unit: 3 percent
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Wasco
Percent of map unit: 2 percent
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

121—Grangeville fine sandy loam, saline-alkali, partially d rained

Map Unit Setting
National map unit symbol: hhj6
Elevation: 210 to 290 feet
Mean annual precipitation: 7 to 8 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 250 to 275 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Grangeville and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Grangeville

Setting
Landform: Flood plains, alluvial fans
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Alluvium derived from granite

Typical profile

A - 0 to 10 inches: fine sandy loam
C - 10 to 60 inches: stratified sandy loam to fine sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 20.0
Available water supply, 0 to 60 inches: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: B/D
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Minor Components

Nord

Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Grangeville

Percent of map unit: 3 percent
Landform: Alluvial fans
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Whitewolf

Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Vanguard

Percent of map unit: 3 percent
Landform: Flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Kimberlina

Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

130—Kimberlina fine sandy loam, saline-alkali

Map Unit Setting

National map unit symbol: hhjh
Elevation: 190 to 3,500 feet
Mean annual precipitation: 4 to 8 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 210 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Kimberlina and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kimberlina

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

Ap - 0 to 8 inches: fine sandy loam
C - 8 to 60 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 25.0
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Wasco
Percent of map unit: 2 percent
Hydric soil rating: No

Nord
Percent of map unit: 2 percent
Hydric soil rating: No

Excelsior
Percent of map unit: 2 percent
Hydric soil rating: No

Kimberlina, sandy substratum
Percent of map unit: 2 percent
Hydric soil rating: No

Garces
Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, rare flooding
Percent of map unit: 1 percent
Hydric soil rating: No

Cajon
Percent of map unit: 1 percent
Hydric soil rating: No

Melga
Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, rare flooding
Percent of map unit: 1 percent
Landform: Sloughs
Hydric soil rating: Yes

Yound
Percent of map unit: 1 percent
Hydric soil rating: No

Remnoy
Percent of map unit: 1 percent
Hydric soil rating: No

131—Kimberlina fine sandy loam, sandy substratum

Map Unit Setting
National map unit symbol: hhjj
Elevation: 250 to 3,500 feet
Mean annual precipitation: 7 inches

Mean annual air temperature: 63 degrees F
Frost-free period: 255 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Kimberlina and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kimberlina

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

Ap - 0 to 8 inches: fine sandy loam
C - 8 to 41 inches: fine sandy loam
2C - 41 to 60 inches: loamy fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Nord

Percent of map unit: 3 percent
Hydric soil rating: No

Excelsior

Percent of map unit: 3 percent
Hydric soil rating: No

Cajon

Percent of map unit: 3 percent
Hydric soil rating: No

Kimberlina, saline alkali
Percent of map unit: 3 percent
Hydric soil rating: No

Unnamed, rare flooding
Percent of map unit: 1 percent
Landform: Sloughs
Hydric soil rating: Yes

Wasco
Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, rare flooding
Percent of map unit: 1 percent
Hydric soil rating: No

132—Kimberlina saline alkali-Garces complex

Map Unit Setting
National map unit symbol: hhjk
Elevation: 190 to 3,500 feet
Mean annual precipitation: 4 to 8 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 210 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition
Kimberlina and similar soils: 50 percent
Garces and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kimberlina

Setting
Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile
Ap - 0 to 8 inches: fine sandy loam
C - 8 to 60 inches: fine sandy loam

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained

Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 25.0
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Description of Garces

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

A - 0 to 9 inches: loam
Btk1 - 9 to 17 inches: clay loam
Btk2 - 17 to 22 inches: sandy clay loam
Ck - 22 to 60 inches: stratified sandy loam to clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 9 inches to natric
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 30.0
Available water supply, 0 to 60 inches: Very low (about 1.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Cajon
Percent of map unit: 4 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Lakeside
Percent of map unit: 3 percent
Landform: Rims
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Goldberg
Percent of map unit: 3 percent
Landform: Alluvial flats
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Lemoore
Percent of map unit: 2 percent
Landform: Alluvial flats
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Unnamed, rare flooding
Percent of map unit: 1 percent
Landform: Sloughs
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Unnamed, rare flooding
Percent of map unit: 1 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Nord
Percent of map unit: 1 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

135—Lakeside clay loam, drained

Map Unit Setting
National map unit symbol: hhjn
Elevation: 170 to 260 feet
Mean annual precipitation: 8 inches
Mean annual air temperature: 64 degrees F
Frost-free period: 260 to 275 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Lakeside and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lakeside

Setting

Landform: Rims on basin floors
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

Ap - 0 to 17 inches: loam
Czg - 17 to 60 inches: stratified sandy loam to clay

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 35.0
Available water supply, 0 to 60 inches: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: C
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Minor Components

Excelsior

Percent of map unit: 4 percent
Hydric soil rating: No

Grangeville

Percent of map unit: 3 percent
Landform: Alluvial fans
Hydric soil rating: Yes

Garces

Percent of map unit: 2 percent
Hydric soil rating: No

Corona
Percent of map unit: 2 percent
Hydric soil rating: No

Kimberlina
Percent of map unit: 2 percent
Hydric soil rating: No

Melga
Percent of map unit: 2 percent
Hydric soil rating: No

140—Melga silt loam

Map Unit Setting
National map unit symbol: hhjt
Elevation: 220 to 280 feet
Mean annual precipitation: 2 inches
Mean annual air temperature: 63 degrees F
Frost-free period: 250 to 275 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Melga and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Melga

Setting
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile
A - 0 to 4 inches: silt loam
Btk - 4 to 18 inches: silty clay loam
Ck - 18 to 26 inches: clay loam
2C - 26 to 60 inches: stratified fine sandy loam to silty clay loam

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: 10 to 20 inches to duripan
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 70.0
Available water supply, 0 to 60 inches: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: D
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Minor Components

Remnoy

Percent of map unit: 2 percent
Hydric soil rating: No

Corona

Percent of map unit: 2 percent
Hydric soil rating: No

Garces

Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed, rare flooding

Percent of map unit: 2 percent
Hydric soil rating: No

Excelsior

Percent of map unit: 2 percent
Hydric soil rating: No

Youd

Percent of map unit: 2 percent
Hydric soil rating: No

Lakeside

Percent of map unit: 1 percent
Landform: Rims
Hydric soil rating: Yes

Unnamed, rare flooding

Percent of map unit: 1 percent
Landform: Sloughs
Hydric soil rating: Yes

Kimberlina

Percent of map unit: 1 percent
Hydric soil rating: No

147—Nord fine sandy loam

Map Unit Setting

National map unit symbol: hhk1
Elevation: 210 to 290 feet
Mean annual precipitation: 8 to 9 inches
Mean annual air temperature: 61 to 62 degrees F
Frost-free period: 250 to 260 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Nord and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nord

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock and/or igneous rock

Typical profile

A - 0 to 18 inches: fine sandy loam
C - 18 to 72 inches: stratified sandy loam to loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Lakeside
Percent of map unit: 3 percent
Landform: Rims
Hydric soil rating: Yes

Grangeville
Percent of map unit: 3 percent
Landform: Alluvial fans
Hydric soil rating: Yes

Cajon
Percent of map unit: 2 percent
Hydric soil rating: No

Nor, saline-alkali
Percent of map unit: 2 percent
Hydric soil rating: No

Kimberlina
Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed, rare flooding
Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, rare flooding
Percent of map unit: 1 percent
Landform: Sloughs
Hydric soil rating: Yes

Whitewolf
Percent of map unit: 1 percent
Hydric soil rating: No

148—Nord fine sandy loam, saline-alkali

Map Unit Setting
National map unit symbol: hhk2
Elevation: 200 to 600 feet
Mean annual precipitation: 8 to 12 inches
Mean annual air temperature: 63 degrees F
Frost-free period: 250 to 260 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Nord and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nord

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous rock

Typical profile

A - 0 to 18 inches: fine sandy loam
C - 18 to 72 inches: stratified sandy loam to loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: B
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Minor Components

Nord, unsaline-alkali

Percent of map unit: 2 percent
Hydric soil rating: No

Kimberlina

Percent of map unit: 2 percent
Hydric soil rating: No

Grangeville

Percent of map unit: 2 percent
Landform: Alluvial fans
Hydric soil rating: Yes

Lakeside

Percent of map unit: 2 percent
Landform: Rims
Hydric soil rating: Yes

Cajon

Percent of map unit: 2 percent
Hydric soil rating: No

Vanguard
Percent of map unit: 2 percent
Landform: Flood plains
Hydric soil rating: Yes

Whitewolf
Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, rare flooding
Percent of map unit: 1 percent
Landform: Sloughs
Hydric soil rating: Yes

Unnamed, rare flooding
Percent of map unit: 1 percent
Hydric soil rating: No

149—Nord complex

Map Unit Setting
National map unit symbol: hhk3
Elevation: 190 to 600 feet
Mean annual precipitation: 8 to 12 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 250 to 275 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition
Nord and similar soils: 50 percent
Nord and similar soils: 40 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nord

Setting
Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous rock

Typical profile
A - 0 to 18 inches: fine sandy loam
C - 18 to 72 inches: stratified sandy loam to loam

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: B
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Description of Nord

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous rock

Typical profile

A - 0 to 18 inches: fine sandy loam
C - 18 to 72 inches: stratified sandy loam to loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Lakeside

Percent of map unit: 2 percent

Landform: Rims
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Grangeville
Percent of map unit: 2 percent
Landform: Alluvial fans
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Kimberlina
Percent of map unit: 2 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Cajon
Percent of map unit: 1 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Whitewolf
Percent of map unit: 1 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Unnamed, rare flooding
Percent of map unit: 1 percent
Landform: Sloughs
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Unnamed, rare flooding
Percent of map unit: 1 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

154—Pits and Dumps

Map Unit Setting
National map unit symbol: hhk8
Elevation: 200 to 3,400 feet
Mean annual precipitation: 5 to 7 inches
Mean annual air temperature: 64 degrees F
Frost-free period: 260 to 275 days
Farmland classification: Not prime farmland

Map Unit Composition
Pits: 46 percent
Dumps: 44 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pits

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: No

Description of Dumps

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: No

Minor Components

Delgado

Percent of map unit: 2 percent
Hydric soil rating: No

Cajon

Percent of map unit: 2 percent
Hydric soil rating: No

Nord

Percent of map unit: 1 percent
Hydric soil rating: No

Panoche

Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, rare flooding

Percent of map unit: 1 percent
Landform: Drainageways
Hydric soil rating: Yes

Henneke

Percent of map unit: 1 percent
Hydric soil rating: No

Kimberlina

Percent of map unit: 1 percent
Hydric soil rating: No

Wasco

Percent of map unit: 1 percent
Hydric soil rating: No

158—Remnoy very fine sandy loam

Map Unit Setting

National map unit symbol: hhkd
Elevation: 190 to 300 feet
Mean annual precipitation: 7 to 8 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 250 to 275 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Remnoy and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Remnoy

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

A - 0 to 5 inches: very fine sandy loam
Bt - 5 to 15 inches: clay loam
Ckqm - 15 to 29 inches: indurated
2C - 29 to 70 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 10 to 20 inches to duripan
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 100.0
Available water supply, 0 to 60 inches: Very low (about 1.6 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: D
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Minor Components

Melga
Percent of map unit: 2 percent
Hydric soil rating: No

Remnoy, not flooded
Percent of map unit: 2 percent
Hydric soil rating: No

Kimberlina
Percent of map unit: 2 percent
Hydric soil rating: No

Lakeside
Percent of map unit: 2 percent
Landform: Rims
Hydric soil rating: Yes

Excelsior
Percent of map unit: 2 percent
Hydric soil rating: No

Nord
Percent of map unit: 2 percent
Hydric soil rating: No

Garces
Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed, rare flooding
Percent of map unit: 1 percent
Landform: Sloughs
Hydric soil rating: Yes

167—Urban land

Map Unit Composition
Urban land: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Minor Components

Grangeville
Percent of map unit: 3 percent
Landform: Alluvial fans
Hydric soil rating: Yes

Kimberlina
Percent of map unit: 3 percent
Hydric soil rating: No

Nord
Percent of map unit: 2 percent
Hydric soil rating: No

Lemoore
Percent of map unit: 2 percent
Landform: Alluvial fans
Hydric soil rating: Yes

Wasco
Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, rare flooding
Percent of map unit: 1 percent
Landform: Sloughs
Hydric soil rating: Yes

Lakeside
Percent of map unit: 1 percent
Landform: Basin floors
Hydric soil rating: Yes

Panoche
Percent of map unit: 1 percent
Hydric soil rating: No

Lethent
Percent of map unit: 1 percent
Hydric soil rating: No

174—Wasco sandy loam, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: hhkx
Elevation: 250 to 3,700 feet
Mean annual precipitation: 4 to 7 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 210 to 275 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Wasco and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wasco

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sandstone

Typical profile

A - 0 to 20 inches: sandy loam
C - 20 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Kettleman

Percent of map unit: 3 percent
Hydric soil rating: No

Kimberlina

Percent of map unit: 3 percent
Hydric soil rating: No

Cantua

Percent of map unit: 3 percent
Hydric soil rating: No

Avenal

Percent of map unit: 2 percent
Hydric soil rating: No

Cajon

Percent of map unit: 2 percent
Hydric soil rating: No

Panoche

Percent of map unit: 2 percent
Hydric soil rating: No

178—Westhaven clay loam, saline-alkali, 0 to 2 percent slop es

Map Unit Setting

National map unit symbol: hhl1
Elevation: 200 to 400 feet
Mean annual precipitation: 6 to 8 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 240 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Westhaven and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Westhaven

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

Ap - 0 to 10 inches: clay loam
C - 10 to 40 inches: stratified fine sandy loam to clay
2C - 40 to 60 inches: stratified silty clay loam to silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Minor Components

Excelsior
Percent of map unit: 4 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Lethent
Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Westcamp
Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Westhaven, loam
Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Unnamed, rare flooding
Percent of map unit: 2 percent
Landform: Sloughs
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

179—Whitewolf coarse sandy loam

Map Unit Setting
National map unit symbol: hhl2
Elevation: 200 to 4,000 feet
Mean annual precipitation: 6 to 9 inches
Mean annual air temperature: 64 degrees F
Frost-free period: 200 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition
Whitewolf and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Whitewolf

Setting
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

Ap - 0 to 10 inches: coarse sandy loam
C - 10 to 60 inches: sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Cajon

Percent of map unit: 4 percent
Hydric soil rating: No

Wasco

Percent of map unit: 4 percent
Hydric soil rating: No

Kimberlina

Percent of map unit: 4 percent
Hydric soil rating: No

Unnamed, rare flooding

Percent of map unit: 3 percent
Landform: Sloughs
Hydric soil rating: Yes

181—Water

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Water

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: Unranked

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
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 content: 10 percent
Gypsum, maximum content: 2 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Ecological site: R017XY907CA - Aridic Alkali Desert
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
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 content: 10 percent
Gypsum, maximum content: 2 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 30.0
Available water supply, 0 to 60 inches: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Minor Components

Tujunga

Percent of map unit: 3 percent
Landform: Flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Colpien

Percent of map unit: 3 percent
Landform: Fan remnants
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Yettem

Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Tagus

Percent of map unit: 2 percent
Landform: Fan remnants
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Grangeville

Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Hanford

Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Unnamed, ponded

Percent of map unit: 1 percent
Landform: Depressions
Ecological site: R017XY907CA - Aridic Alkali Desert
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
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 content: 5 percent
Maximum salinity: Nonsaline to slightly saline (0.5 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: High (about 10.7 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: C
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Hanford

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Biggriz

Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Gambogy

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
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: Alluvial fans, flood plains
Hydric soil rating: No

Akers, saline-sodic

Percent of map unit: 2 percent
Landform: Fan remnants

Hydric soil rating: No

114—Exeter loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hp4j
Elevation: 250 to 570 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: Farmland of statewide importance

Map Unit Composition

Exeter, 0-2% slopes, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Exeter, 0-2% Slopes

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 9 inches: loam
Bt1 - 9 to 26 inches: sandy clay loam
Bt2 - 26 to 28 inches: clay loam
Btqm - 28 to 46 inches: indurated
2Bt - 46 to 72 inches: stratified very gravelly loamy coarse sand to gravelly loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to duripan
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.01 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 4s

Hydrologic Soil Group: C
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Minor Components

Hanford
Percent of map unit: 4 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Colpien
Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

San joaquin
Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Quonal
Percent of map unit: 2 percent
Landform: Fan remnants
Hydric soil rating: No

Calgro
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

116—Flamen loam, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: hp4l
Elevation: 260 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
Flamen and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Flamen

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

Ap1 - 0 to 17 inches: loam
Ap2 - 17 to 28 inches: loam
Btk - 28 to 43 inches: loam
2Btkqm - 43 to 72 inches: cemented

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 40 to 60 inches to duripan
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Minor Components

Exeter

Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

San joaquin

Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Hanford

Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Calgro

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

Centerville

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

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: Alluvial fans, flood plains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Convex, linear
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

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 content: 3 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Grangeville

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Colpien

Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Hanford

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
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: Alluvial fans, flood plains
Hydric soil rating: No

Yettem

Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

122—Grangeville sandy loam, drained, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hp4s
Elevation: 190 to 400 feet
Mean annual precipitation: 8 to 12 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 250 to 275 days
Farmland classification: Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Grangeville and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Grangeville

Setting

Landform: Alluvial fans, flood plains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Convex, linear
Parent material: Alluvium derived from granitic rock sources

Typical profile

Ap - 0 to 16 inches: sandy loam
Bg - 16 to 27 inches: sandy loam
2C - 27 to 67 inches: stratified loamy sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly 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: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c

Hydrologic Soil Group: A
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: Yes

Minor Components

Yettem
Percent of map unit: 3 percent
Landform: Flood plains, alluvial fans
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Tujunga
Percent of map unit: 3 percent
Landform: Flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Grangeville, saline-sodic
Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: Yes

Nord
Percent of map unit: 1 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Hanford
Percent of map unit: 1 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

130—Nord fine sandy loam, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: hp51
Elevation: 190 to 520 feet
Mean annual precipitation: 8 to 12 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 250 to 275 days
Farmland classification: Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition
Nord and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nord

Setting

Landform: Alluvial fans, flood plains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Convex, linear
Parent material: Alluvium derived from mixed

Typical profile

Ap - 0 to 11 inches: fine sandy loam
C1 - 11 to 38 inches: stratified sandy loam to loam
C2 - 38 to 50 inches: stratified loamy coarse sand to coarse sandy loam
2Btb - 50 to 72 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches; More than 80 inches
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 content: 4 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 10.0
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Grangeville, saline-sodic

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: Yes

Hanford

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Tujunga

Percent of map unit: 3 percent
Landform: Flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Tagus
Percent of map unit: 2 percent
Landform: Fan remnants
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Akers
Percent of map unit: 2 percent
Landform: Fan remnants
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Colpien
Percent of map unit: 2 percent
Landform: Fan remnants
Ecological site: R017XY904CA - Subirrigated Deep 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
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 content: 10 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Minor Components

Tujunga

Percent of map unit: 5 percent
Landform: Flood plains
Hydric soil rating: No

Hanford

Percent of map unit: 5 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Grangeville

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Colpien

Percent of map unit: 2 percent
Landform: Fan remnants
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

143—Yettem sandy loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hp5g
Elevation: 270 to 530 feet
Mean annual precipitation: 9 to 12 inches
Mean annual air temperature: 62 to 65 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

Yettem and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Yettem

Setting

Landform: Alluvial fans, flood plains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

Ap - 0 to 13 inches: sandy loam
C - 13 to 63 inches: sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
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 content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 5.0
Available water supply, 0 to 60 inches: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: A
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Minor Components

Grangeville

Percent of map unit: 5 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: Yes

Kimberlina

Percent of map unit: 5 percent
Landform: Flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans

Hydric soil rating: No

Colpien

Percent of map unit: 3 percent
Landform: Fan remnants
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Tujunga

Percent of map unit: 2 percent
Landform: Flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

145—Water-perennial

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Water

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: Unranked

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United States Department of Agriculture

NRCS

Natural Resources Conservation Service

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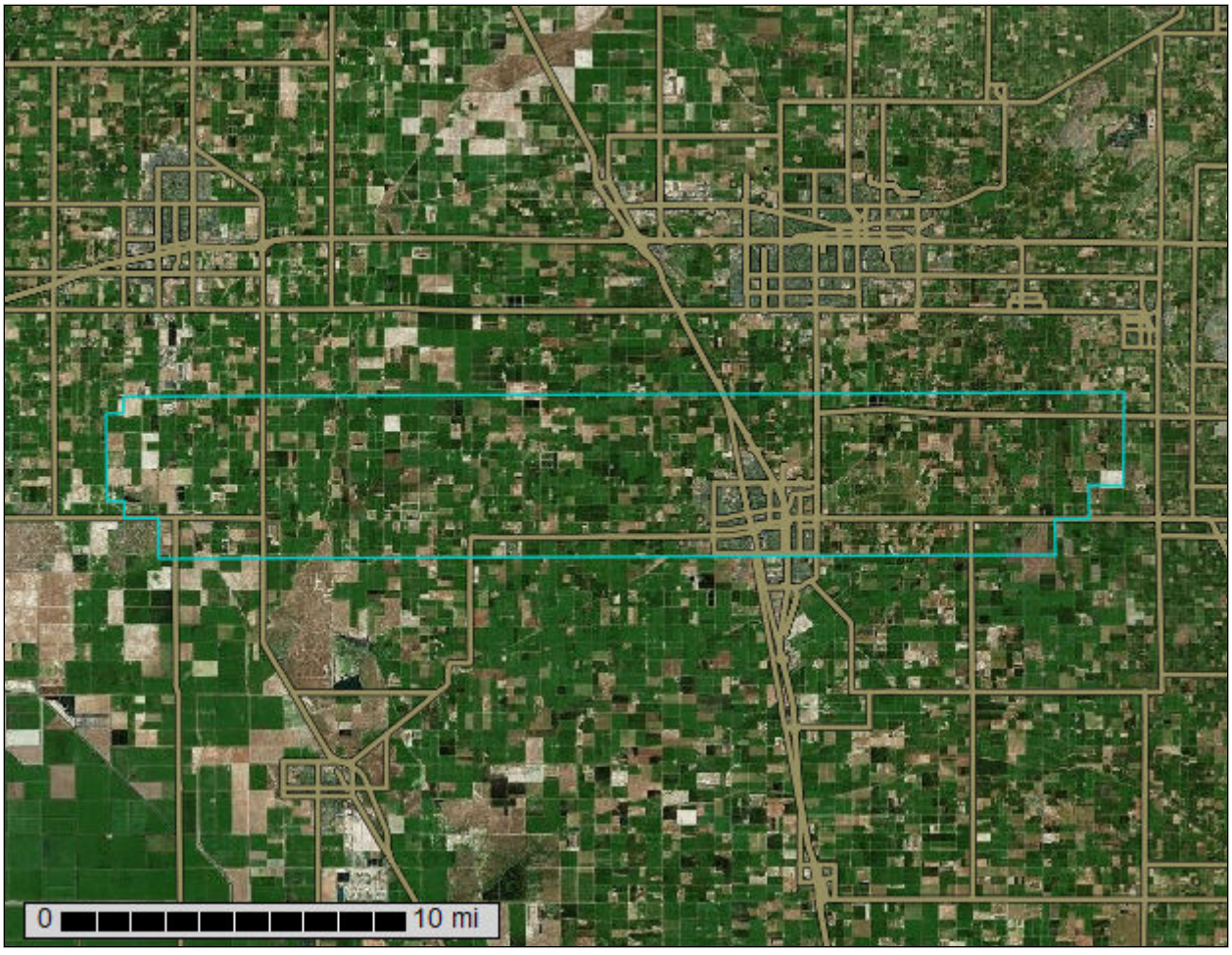
Custom Soil Resource Report for Kings County, California; and Tulare County, Western Part, California



November 11, 2024

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.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

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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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.

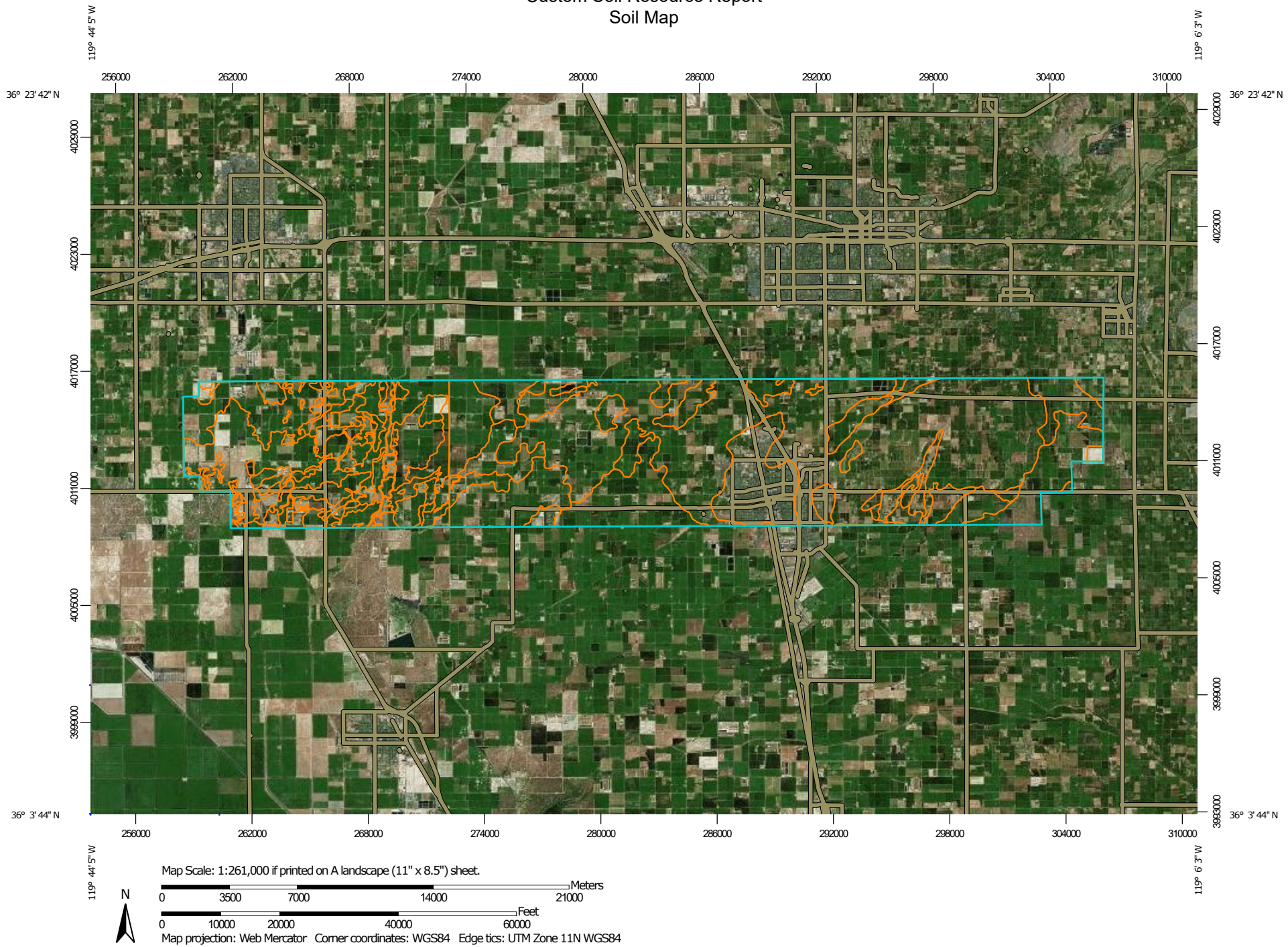
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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 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: Kings County, California
Survey Area Data: Version 20, Aug 30, 2024

Soil Survey Area: Tulare County, Western Part, California
Survey Area Data: Version 18, Aug 30, 2024

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 1, 1999—Dec 31, 2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

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
104	Cajon sandy loam	587.0	0.7%
104tw	Biggriz-Biggriz, saline-Sodic, complex, 0 to 2 percent slopes	404.5	0.5%
108	Corona silt loam	423.1	0.5%
112	Excelsior sandy loam	81.6	0.1%
113	Garces loam	1,693.6	2.0%
117	Goldberg loam, drained	315.0	0.4%
117tw	Gambogy loam, drained, 0 to 1 percent slopes	1,694.2	2.0%
120	Grangeville fine sandy loam, partially drained	624.9	0.7%
121	Grangeville fine sandy loam, saline-alkali, partially d rained	781.1	0.9%
130	Kimberlina fine sandy loam, saline-alkali	5,313.9	6.2%
131	Kimberlina fine sandy loam, sandy substratum	171.7	0.2%
132	Kimberlina saline alkali-Garces complex	6,405.5	7.5%
134	Lakeside loam, partially drained	92.5	0.1%
135	Lakeside clay loam, drained	1,780.1	2.1%
147	Nord fine sandy loam	336.9	0.4%
148	Nord fine sandy loam, saline-alkali	719.3	0.8%
149	Nord complex	1,045.7	1.2%
174	Wasco sandy loam, 0 to 5 percent slopes	1,158.9	1.4%
178	Westhaven clay loam, saline-alkali, 0 to 2 percent slop es	80.4	0.1%
179	Whitewolf coarse sandy loam	92.6	0.1%
181	Water	277.1	0.3%
Subtotals for Soil Survey Area		**24,079.6**	**28.3%**
Totals for Area of Interest		**85,091.0**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
101	Akers-Akers, saline-Sodic, complex, 0 to 2 percent slopes	3,417.1	4.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
104	Biggriz-Biggriz, saline-Sodic, complex, 0 to 2 percent slopes	1,042.1	1.2%
105	Calgro-Calgro, saline-Sodic, complex, 0 to 2 percent slopes	67.0	0.1%
108	Colpien loam, 0 to 2 percent slopes	9,745.9	11.5%
112	Dumps	1.9	0.0%
114	Exeter loam, 0 to 2 percent slopes	336.9	0.4%
116	Flamen loam, 0 to 2 percent slopes	2,633.6	3.1%
117	Gambogy loam, drained, 0 to 1 percent slopes	5,327.1	6.3%
122	Grangeville sandy loam, drained, 0 to 2 percent slopes	265.0	0.3%
124	Hanford sandy loam, 0 to 2 percent slopes	1,406.0	1.7%
130	Nord fine sandy loam, 0 to 2 percent slopes	30,124.5	35.4%
132	Quonal-Lewis association, 0 to 2 percent slopes	3,100.0	3.6%
137	Tagus loam, 0 to 2 percent slopes	1,879.6	2.2%
138	Tujunga loamy sand, 0 to 2 percent slopes	832.1	1.0%
143	Yettem sandy loam, 0 to 2 percent slopes	428.5	0.5%
145	Water-perennial	165.7	0.2%
Subtotals for Soil Survey Area		**60,773.1**	**71.4%**
Totals for Area of Interest		**85,091.0**	**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.

Kings County, California

104—Cajon sandy loam

Map Unit Setting

National map unit symbol: hhhn
Elevation: 320 to 400 feet
Mean annual precipitation: 5 to 7 inches
Mean annual air temperature: 61 to 70 degrees F
Frost-free period: 240 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Cajon and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cajon

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

Ap - 0 to 11 inches: sandy loam
C - 11 to 60 inches: loamy sand
2C - 60 to 70 inches: stratified sand to loamy fine sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Kimberlina

Percent of map unit: 4 percent

Hydric soil rating: No

Cajon, calcareous
Percent of map unit: 4 percent
Hydric soil rating: No

Nord
Percent of map unit: 3 percent
Hydric soil rating: No

Lemoore
Percent of map unit: 1 percent
Landform: Alluvial fans
Hydric soil rating: Yes

Wasco
Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, rare flooding
Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, rare flooding
Percent of map unit: 1 percent
Landform: Sloughs
Hydric soil rating: Yes

104tw—Biggriz-Biggriz, saline-Sodic, complex, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: 2dg7w
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
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 content: 10 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 13.0
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Ecological site: R017XY907CA - Aridic Alkali Desert
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
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 content: 10 percent

Gypsum, maximum content: 1 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 200.0
Available water supply, 0 to 60 inches: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Minor Components

Gambogy

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Nord

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Lethent

Percent of map unit: 2 percent
Landform: Fan remnants
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Garces

Percent of map unit: 2 percent
Landform: Fan remnants
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Colpien

Percent of map unit: 2 percent
Landform: Fan remnants
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Tujunga

Percent of map unit: 2 percent
Landform: Flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Unnamed, ponded

Percent of map unit: 1 percent
Landform: Depressions
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

108—Corona silt loam

Map Unit Setting

National map unit symbol: hhhs
Elevation: 200 to 400 feet
Mean annual precipitation: 8 inches
Mean annual air temperature: 61 degrees F
Frost-free period: 250 to 275 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Corona and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Corona

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

A - 0 to 25 inches: silt loam
Btk1 - 25 to 42 inches: silty clay loam
Btk2 - 42 to 55 inches: loam
C - 55 to 64 inches: sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C

Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Kimberlina
Percent of map unit: 4 percent
Hydric soil rating: No

Nord
Percent of map unit: 2 percent
Hydric soil rating: No

Melga
Percent of map unit: 2 percent
Hydric soil rating: No

Lakeside
Percent of map unit: 2 percent
Landform: Rims
Hydric soil rating: Yes

Remnoy
Percent of map unit: 2 percent
Hydric soil rating: No

Corona, saline-alkali
Percent of map unit: 1 percent
Hydric soil rating: No

Whitewolf
Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, rare flooding
Percent of map unit: 1 percent
Landform: Sloughs
Hydric soil rating: Yes

112—Excelsior sandy loam

Map Unit Setting
National map unit symbol: hhhx
Elevation: 200 to 280 feet
Mean annual precipitation: 5 to 8 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 240 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Excelsior and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Excelsior

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

Ap - 0 to 8 inches: sandy loam
C - 8 to 26 inches: stratified loamy sand to sandy loam
2C - 26 to 60 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Very slightly saline to strongly saline (2.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 80.0
Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Minor Components

Melga

Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Garces

Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Remnoy

Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Youd

Percent of map unit: 2 percent
Ecological site: R017XY907CA - Aridic Alkali Desert

Hydric soil rating: No

Unnamed, rare flooding

Percent of map unit: 1 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Unnamed, rare flooding

Percent of map unit: 1 percent
Landform: Sloughs
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Nord

Percent of map unit: 1 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Kimberlina

Percent of map unit: 1 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

113—Garces loam

Map Unit Setting

National map unit symbol: hhhy
Elevation: 200 to 400 feet
Mean annual precipitation: 5 to 8 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 250 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Garces and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Garces

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

A - 0 to 9 inches: loam
Btk1 - 9 to 17 inches: clay loam
Btk2 - 17 to 22 inches: sandy clay loam

Ck - 22 to 60 inches: stratified sandy loam to clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 9 to 14 inches to natric
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 30.0
Available water supply, 0 to 60 inches: Very low (about 1.3 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R017XY905CA - Dry Alluvial Fans and Terraces
Hydric soil rating: No

Minor Components

Corona

Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Kimberlina

Percent of map unit: 2 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Excelsior

Percent of map unit: 2 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Goldberg

Percent of map unit: 2 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Wasco

Percent of map unit: 1 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Unnamed, rare flooding

Percent of map unit: 1 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Cajon

Percent of map unit: 1 percent
Ecological site: R017XY907CA - Aridic Alkali Desert

Hydric soil rating: No

Playas

Percent of map unit: 1 percent
Landform: Playas
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Unnamed, rare flooding

Percent of map unit: 1 percent
Landform: Sloughs
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Lakeside

Percent of map unit: 1 percent
Landform: Rims
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

117—Goldberg loam, drained

Map Unit Setting

National map unit symbol: hhj2
Elevation: 200 to 240 feet
Mean annual precipitation: 7 inches
Mean annual air temperature: 64 degrees F
Frost-free period: 250 to 275 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Goldberg and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Goldberg

Setting

Landform: Alluvial flats
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

A - 0 to 1 inches: loam
Bt - 1 to 6 inches: clay loam
Btk - 6 to 32 inches: clay
Btg - 32 to 38 inches: clay loam
Cg - 38 to 60 inches: stratified loamy sand to clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 6 to 24 inches to natric
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 42.0
Available water supply, 0 to 60 inches: Very low (about 1.0 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: D
Ecological site: R017XY905CA - Dry Alluvial Fans and Terraces
Hydric soil rating: Yes

Minor Components

Cajon

Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Goldberg

Percent of map unit: 2 percent
Landform: Alluvial flats
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Garces

Percent of map unit: 2 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Whitewolf

Percent of map unit: 2 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Kimberlina

Percent of map unit: 2 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Lakeside

Percent of map unit: 2 percent
Landform: Basin floors
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Nord

Percent of map unit: 2 percent

Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

117tw—Gambogy loam, drained, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2dg7y
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: Alluvial fans, flood plains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Convex, linear
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
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 content: 3 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Hanford

Percent of map unit: 3 percent
Landform: Alluvial fans, 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: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Yettem

Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
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: Alluvial fans, flood plains
Hydric soil rating: No

120—Grangeville fine sandy loam, partially drained

Map Unit Setting

National map unit symbol: hhj5
Elevation: 210 to 290 feet
Mean annual precipitation: 7 to 8 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 250 to 275 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Grangeville and similar soils: 85 percent

Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Grangeville

Setting

Landform: Flood plains, alluvial fans
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

A - 0 to 10 inches: fine sandy loam
C - 10 to 60 inches: stratified sandy loam to fine sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: A/D
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: Yes

Minor Components

Nord

Percent of map unit: 4 percent
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Vanguard

Percent of map unit: 3 percent
Landform: Flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: Yes

Kimberlina

Percent of map unit: 3 percent
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Whitewolf

Percent of map unit: 3 percent

Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Wasco

Percent of map unit: 2 percent
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

121—Grangeville fine sandy loam, saline-alkali, partially d rained

Map Unit Setting

National map unit symbol: hhj6
Elevation: 210 to 290 feet
Mean annual precipitation: 7 to 8 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 250 to 275 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Grangeville and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Grangeville

Setting

Landform: Flood plains, alluvial fans
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

A - 0 to 10 inches: fine sandy loam
C - 10 to 60 inches: stratified sandy loam to fine sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 20.0
Available water supply, 0 to 60 inches: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: B/D
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Minor Components

Nord

Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Grangeville

Percent of map unit: 3 percent
Landform: Alluvial fans
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Whitewolf

Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Vanguard

Percent of map unit: 3 percent
Landform: Flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Kimberlina

Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

130—Kimberlina fine sandy loam, saline-alkali

Map Unit Setting

National map unit symbol: hhjh
Elevation: 190 to 3,500 feet
Mean annual precipitation: 4 to 8 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 210 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Kimberlina and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kimberlina

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

Ap - 0 to 8 inches: fine sandy loam
C - 8 to 60 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 25.0
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Wasco

Percent of map unit: 2 percent
Hydric soil rating: No

Nord

Percent of map unit: 2 percent
Hydric soil rating: No

Excelsior

Percent of map unit: 2 percent
Hydric soil rating: No

Kimberlina, sandy substratum

Percent of map unit: 2 percent
Hydric soil rating: No

Garces

Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, rare flooding
Percent of map unit: 1 percent
Hydric soil rating: No

Cajon
Percent of map unit: 1 percent
Hydric soil rating: No

Melga
Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, rare flooding
Percent of map unit: 1 percent
Landform: Sloughs
Hydric soil rating: Yes

Yound
Percent of map unit: 1 percent
Hydric soil rating: No

Remnoy
Percent of map unit: 1 percent
Hydric soil rating: No

131—Kimberlina fine sandy loam, sandy substratum

Map Unit Setting
National map unit symbol: hhjj
Elevation: 250 to 3,500 feet
Mean annual precipitation: 7 inches
Mean annual air temperature: 63 degrees F
Frost-free period: 255 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition
Kimberlina and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kimberlina

Setting
Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile
Ap - 0 to 8 inches: fine sandy loam

C - 8 to 41 inches: fine sandy loam
2C - 41 to 60 inches: loamy fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Nord

Percent of map unit: 3 percent
Hydric soil rating: No

Excelsior

Percent of map unit: 3 percent
Hydric soil rating: No

Cajon

Percent of map unit: 3 percent
Hydric soil rating: No

Kimberlina, saline alkali

Percent of map unit: 3 percent
Hydric soil rating: No

Unnamed, rare flooding

Percent of map unit: 1 percent
Landform: Sloughs
Hydric soil rating: Yes

Wasco

Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, rare flooding

Percent of map unit: 1 percent
Hydric soil rating: No

132—Kimberlina saline alkali-Garces complex

Map Unit Setting

National map unit symbol: hhjk
Elevation: 190 to 3,500 feet
Mean annual precipitation: 4 to 8 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 210 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition

Kimberlina and similar soils: 50 percent
Garces and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kimberlina

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

Ap - 0 to 8 inches: fine sandy loam
C - 8 to 60 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 25.0
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert

Hydric soil rating: No

Description of Garces

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

A - 0 to 9 inches: loam
Btk1 - 9 to 17 inches: clay loam
Btk2 - 17 to 22 inches: sandy clay loam
Ck - 22 to 60 inches: stratified sandy loam to clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 9 inches to natric
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 30.0
Available water supply, 0 to 60 inches: Very low (about 1.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Cajon

Percent of map unit: 4 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Lakeside

Percent of map unit: 3 percent
Landform: Rims
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Goldberg

Percent of map unit: 3 percent
Landform: Alluvial flats
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Lemoore
Percent of map unit: 2 percent
Landform: Alluvial flats
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Unnamed, rare flooding
Percent of map unit: 1 percent
Landform: Sloughs
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Unnamed, rare flooding
Percent of map unit: 1 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Nord
Percent of map unit: 1 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

134—Lakeside loam, partially drained

Map Unit Setting
National map unit symbol: hhjm
Elevation: 170 to 260 feet
Mean annual precipitation: 8 inches
Mean annual air temperature: 64 degrees F
Frost-free period: 190 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Lakeside and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lakeside

Setting
Landform: Rims on basin floors
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile
Ap - 0 to 17 inches: loam
Czg - 17 to 60 inches: stratified sandy loam to clay

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 35.0
Available water supply, 0 to 60 inches: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: C/D
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Minor Components

Armona

Percent of map unit: 4 percent
Landform: Basin floors
Hydric soil rating: Yes

Westcamp

Percent of map unit: 2 percent
Landform: Basin floors
Hydric soil rating: Yes

Goldberg

Percent of map unit: 2 percent
Landform: Alluvial flats
Hydric soil rating: Yes

Lakeside

Percent of map unit: 2 percent
Landform: Basin floors
Hydric soil rating: Yes

Grangeville

Percent of map unit: 2 percent
Landform: Alluvial fans
Hydric soil rating: Yes

Homeland

Percent of map unit: 2 percent
Landform: Basin floors
Hydric soil rating: Yes

Unnamed, rare flooding

Percent of map unit: 1 percent
Hydric soil rating: No

135—Lakeside clay loam, drained

Map Unit Setting

National map unit symbol: hhjn
Elevation: 170 to 260 feet
Mean annual precipitation: 8 inches
Mean annual air temperature: 64 degrees F
Frost-free period: 260 to 275 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Lakeside and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lakeside

Setting

Landform: Rims on basin floors
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

Ap - 0 to 17 inches: loam
Czg - 17 to 60 inches: stratified sandy loam to clay

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 35.0
Available water supply, 0 to 60 inches: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: C
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Minor Components

Excelsior
Percent of map unit: 4 percent
Hydric soil rating: No

Grangeville
Percent of map unit: 3 percent
Landform: Alluvial fans
Hydric soil rating: Yes

Garces
Percent of map unit: 2 percent
Hydric soil rating: No

Corona
Percent of map unit: 2 percent
Hydric soil rating: No

Kimberlina
Percent of map unit: 2 percent
Hydric soil rating: No

Melga
Percent of map unit: 2 percent
Hydric soil rating: No

147—Nord fine sandy loam

Map Unit Setting
National map unit symbol: hhk1
Elevation: 210 to 290 feet
Mean annual precipitation: 8 to 9 inches
Mean annual air temperature: 61 to 62 degrees F
Frost-free period: 250 to 260 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition
Nord and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nord

Setting
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock and/or igneous rock

Typical profile

A - 0 to 18 inches: fine sandy loam
C - 18 to 72 inches: stratified sandy loam to loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Lakeside

Percent of map unit: 3 percent
Landform: Rims
Hydric soil rating: Yes

Grangeville

Percent of map unit: 3 percent
Landform: Alluvial fans
Hydric soil rating: Yes

Cajon

Percent of map unit: 2 percent
Hydric soil rating: No

Nor, saline-alkali

Percent of map unit: 2 percent
Hydric soil rating: No

Kimberlina

Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed, rare flooding

Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, rare flooding

Percent of map unit: 1 percent
Landform: Sloughs
Hydric soil rating: Yes

Whitewolf
Percent of map unit: 1 percent
Hydric soil rating: No

148—Nord fine sandy loam, saline-alkali

Map Unit Setting
National map unit symbol: hhk2
Elevation: 200 to 600 feet
Mean annual precipitation: 8 to 12 inches
Mean annual air temperature: 63 degrees F
Frost-free period: 250 to 260 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Nord and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nord

Setting
Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous rock

Typical profile
A - 0 to 18 inches: fine sandy loam
C - 18 to 72 inches: stratified sandy loam to loam

Properties and qualities
Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups
Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s

Hydrologic Soil Group: B
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Minor Components

Nord, unsaline-alkali
Percent of map unit: 2 percent
Hydric soil rating: No

Kimberlina
Percent of map unit: 2 percent
Hydric soil rating: No

Grangeville
Percent of map unit: 2 percent
Landform: Alluvial fans
Hydric soil rating: Yes

Lakeside
Percent of map unit: 2 percent
Landform: Rims
Hydric soil rating: Yes

Cajon
Percent of map unit: 2 percent
Hydric soil rating: No

Vanguard
Percent of map unit: 2 percent
Landform: Flood plains
Hydric soil rating: Yes

Whitewolf
Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, rare flooding
Percent of map unit: 1 percent
Landform: Sloughs
Hydric soil rating: Yes

Unnamed, rare flooding
Percent of map unit: 1 percent
Hydric soil rating: No

149—Nord complex

Map Unit Setting
National map unit symbol: hhk3
Elevation: 190 to 600 feet
Mean annual precipitation: 8 to 12 inches
Mean annual air temperature: 61 to 64 degrees F

Frost-free period: 250 to 275 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Nord and similar soils: 50 percent
Nord and similar soils: 40 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nord

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous rock

Typical profile

A - 0 to 18 inches: fine sandy loam
C - 18 to 72 inches: stratified sandy loam to loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: B
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Description of Nord

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous rock

Typical profile

A - 0 to 18 inches: fine sandy loam
C - 18 to 72 inches: stratified sandy loam to loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Lakeside

Percent of map unit: 2 percent
Landform: Rims
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Grangeville

Percent of map unit: 2 percent
Landform: Alluvial fans
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Kimberlina

Percent of map unit: 2 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Cajon

Percent of map unit: 1 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Whitewolf

Percent of map unit: 1 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Unnamed, rare flooding

Percent of map unit: 1 percent
Landform: Sloughs
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Unnamed, rare flooding

Percent of map unit: 1 percent

Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

174—Wasco sandy loam, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: hhkx
Elevation: 250 to 3,700 feet
Mean annual precipitation: 4 to 7 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 210 to 275 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Wasco and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wasco

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sandstone

Typical profile

A - 0 to 20 inches: sandy loam
C - 20 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A

Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Kettleman
Percent of map unit: 3 percent
Hydric soil rating: No

Kimberlina
Percent of map unit: 3 percent
Hydric soil rating: No

Cantua
Percent of map unit: 3 percent
Hydric soil rating: No

Avenal
Percent of map unit: 2 percent
Hydric soil rating: No

Cajon
Percent of map unit: 2 percent
Hydric soil rating: No

Panoche
Percent of map unit: 2 percent
Hydric soil rating: No

178—Westhaven clay loam, saline-alkali, 0 to 2 percent slop es

Map Unit Setting
National map unit symbol: hhl1
Elevation: 200 to 400 feet
Mean annual precipitation: 6 to 8 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 240 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Westhaven and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Westhaven

Setting
Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

Ap - 0 to 10 inches: clay loam
C - 10 to 40 inches: stratified fine sandy loam to clay
2C - 40 to 60 inches: stratified silty clay loam to silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Minor Components

Excelsior

Percent of map unit: 4 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Lethent

Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Westcamp

Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Westhaven, loam

Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Unnamed, rare flooding

Percent of map unit: 2 percent
Landform: Sloughs
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

179—Whitewolf coarse sandy loam

Map Unit Setting

National map unit symbol: hhl2
Elevation: 200 to 4,000 feet
Mean annual precipitation: 6 to 9 inches
Mean annual air temperature: 64 degrees F
Frost-free period: 200 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition

Whitewolf and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Whitewolf

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

Ap - 0 to 10 inches: coarse sandy loam
C - 10 to 60 inches: sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Cajon
Percent of map unit: 4 percent
Hydric soil rating: No

Wasco
Percent of map unit: 4 percent
Hydric soil rating: No

Kimberlina
Percent of map unit: 4 percent
Hydric soil rating: No

Unnamed, rare flooding
Percent of map unit: 3 percent
Landform: Sloughs
Hydric soil rating: Yes

181—Water

Map Unit Composition
Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Water

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: Unranked

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
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 content: 10 percent
Gypsum, maximum content: 2 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Ecological site: R017XY907CA - Aridic Alkali Desert
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
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 content: 10 percent
Gypsum, maximum content: 2 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 30.0
Available water supply, 0 to 60 inches: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Minor Components

Tujunga

Percent of map unit: 3 percent
Landform: Flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Colpien

Percent of map unit: 3 percent
Landform: Fan remnants
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Yettem

Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Tagus

Percent of map unit: 2 percent
Landform: Fan remnants
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Grangeville

Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Hanford

Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Unnamed, ponded

Percent of map unit: 1 percent
Landform: Depressions
Ecological site: R017XY907CA - Aridic Alkali Desert
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
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 content: 10 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 13.0
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Ecological site: R017XY907CA - Aridic Alkali Desert
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
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 content: 10 percent
Gypsum, maximum content: 1 percent

Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 200.0
Available water supply, 0 to 60 inches: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Minor Components

Nord

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Gambogy

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Tujunga

Percent of map unit: 2 percent
Landform: Flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Lethent

Percent of map unit: 2 percent
Landform: Fan remnants
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Colpien

Percent of map unit: 2 percent
Landform: Fan remnants
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Garces

Percent of map unit: 2 percent
Landform: Fan remnants
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Unnamed, ponded

Percent of map unit: 1 percent
Landform: Depressions
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

105—Calgro-Calgro, saline-Sodic, complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hp47
Elevation: 250 to 480 feet
Mean annual precipitation: 8 to 12 inches
Mean annual air temperature: 62 to 65 degrees F
Frost-free period: 250 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Calgro and similar soils: 60 percent
Calgro, saline-sodic, and similar soils: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Calgro

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 granite

Typical profile

Ap - 0 to 7 inches: sandy loam
Bw - 7 to 25 inches: sandy loam
2Bkqm - 25 to 33 inches: cemented
2Bkq - 33 to 53 inches: gravelly loamy sand
3Bkqm - 53 to 60 inches: cemented

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to duripan
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Description of Calgro, 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 granite

Typical profile

Ap - 0 to 8 inches: sandy loam
Bw - 8 to 24 inches: sandy loam
2Bkqm - 24 to 33 inches: cemented
2Bkq - 33 to 52 inches: gravelly loamy sand
3Bkqm - 52 to 60 inches: cemented

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to duripan
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum content: 4 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 100.0
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Minor Components

Colpien

Percent of map unit: 5 percent
Landform: Fan remnants
Hydric soil rating: No

Grangeville

Percent of map unit: 4 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Tujunga
Percent of map unit: 3 percent
Landform: Flood plains
Hydric soil rating: No

Exeter
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

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 content: 5 percent
Maximum salinity: Nonsaline to slightly saline (0.5 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: High (about 10.7 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: C
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Hanford

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Biggriz

Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Gambogy

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
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: Alluvial fans, flood plains
Hydric soil rating: No

Akers, saline-sodic

Percent of map unit: 2 percent
Landform: Fan remnants
Hydric soil rating: No

112—Dumps

Map Unit Composition

Dumps: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dumps

Setting

Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

114—Exeter loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hp4j
Elevation: 250 to 570 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: Farmland of statewide importance

Map Unit Composition

Exeter, 0-2% slopes, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Exeter, 0-2% Slopes

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 9 inches: loam
Bt1 - 9 to 26 inches: sandy clay loam
Bt2 - 26 to 28 inches: clay loam
Btqm - 28 to 46 inches: indurated
2Bt - 46 to 72 inches: stratified very gravelly loamy coarse sand to gravelly loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: 20 to 40 inches to duripan
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.01 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Minor Components

Hanford

Percent of map unit: 4 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Colpien

Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

San joaquin

Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Quonal

Percent of map unit: 2 percent
Landform: Fan remnants
Hydric soil rating: No

Calgro

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

116—Flamen loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hp4l
Elevation: 260 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

Flamen and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Flamen

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

Ap1 - 0 to 17 inches: loam
Ap2 - 17 to 28 inches: loam
Btk - 28 to 43 inches: loam
2Btkqm - 43 to 72 inches: cemented

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 40 to 60 inches to duripan
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: B
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Minor Components

Exeter
Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

San joaquin
Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Hanford
Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Calgro
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

Centerville
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

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: Alluvial fans, flood plains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Convex, linear
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
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 content: 3 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Grangeville

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Colpien

Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Hanford

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
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: Alluvial fans, flood plains
Hydric soil rating: No

Yettem

Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

122—Grangeville sandy loam, drained, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hp4s
Elevation: 190 to 400 feet
Mean annual precipitation: 8 to 12 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 250 to 275 days
Farmland classification: Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Grangeville and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Grangeville

Setting

Landform: Alluvial fans, flood plains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Convex, linear
Parent material: Alluvium derived from granitic rock sources

Typical profile

Ap - 0 to 16 inches: sandy loam
Bg - 16 to 27 inches: sandy loam
2C - 27 to 67 inches: stratified loamy sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly 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: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: A
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: Yes

Minor Components

Yettem

Percent of map unit: 3 percent
Landform: Flood plains, alluvial fans
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Tujunga

Percent of map unit: 3 percent
Landform: Flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Grangeville, saline-sodic

Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: Yes

Nord

Percent of map unit: 1 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Hanford

Percent of map unit: 1 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY904CA - Subirrigated Deep 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: Alluvial fans, flood plains
Landform position (two-dimensional): Footslope, toeslope
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
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 content: 2 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 7.0
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 3c
Hydrologic Soil Group: A

Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Exeter
Percent of map unit: 5 percent
Landform: Fan remnants
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Tujunga
Percent of map unit: 5 percent
Landform: Flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Calgro
Percent of map unit: 3 percent
Landform: Fan remnants
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Yettem
Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

130—Nord fine sandy loam, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: hp51
Elevation: 190 to 520 feet
Mean annual precipitation: 8 to 12 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 250 to 275 days
Farmland classification: Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition
Nord and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nord

Setting
Landform: Alluvial fans, flood plains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope

Down-slope shape: Linear
Across-slope shape: Convex, linear
Parent material: Alluvium derived from mixed

Typical profile

Ap - 0 to 11 inches: fine sandy loam
C1 - 11 to 38 inches: stratified sandy loam to loam
C2 - 38 to 50 inches: stratified loamy coarse sand to coarse sandy loam
2Btb - 50 to 72 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches; More than 80 inches
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 content: 4 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 10.0
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Grangeville, saline-sodic

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: Yes

Hanford

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Tujunga

Percent of map unit: 3 percent
Landform: Flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Tagus

Percent of map unit: 2 percent
Landform: Fan remnants
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Akers

Percent of map unit: 2 percent
Landform: Fan remnants
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Colpien

Percent of map unit: 2 percent
Landform: Fan remnants
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

132—Quonal-Lewis association, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hp53
Elevation: 280 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: Farmland of statewide importance

Map Unit Composition

Quonal and similar soils: 70 percent
Lewis and similar soils: 15 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Quonal

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: Formed by the chemical and mechanical alteration of the lewis series which originally formed in alluvium from mixed rock sources

Typical profile

Ap1 - 0 to 7 inches: silty clay
Ap2 - 7 to 16 inches: gravelly clay
Ap3 - 16 to 41 inches: gravelly clay
2Bkqmb - 41 to 44 inches: duripan
2Bkb - 44 to 62 inches: stratified sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 40 to 60 inches to duripan
Drainage class: Moderately well drained

Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.01 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Gypsum, maximum content: 5 percent
Maximum salinity: Nonsaline to moderately saline (0.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 50.0
Available water supply, 0 to 60 inches: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Description of Lewis

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 mixed

Typical profile

A - 0 to 5 inches: silty clay loam
Btkn - 5 to 25 inches: clay
2Bkqm - 25 to 39 inches: cemented
3Bkq - 39 to 60 inches: stratified sandy loam to clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 2 to 6 inches to natric; 20 to 40 inches to duripan
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.01 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum content: 8 percent
Maximum salinity: Moderately saline to strongly saline (8.0 to 40.0 mmhos/cm)
Sodium adsorption ratio, maximum: 100.0
Available water supply, 0 to 60 inches: Very low (about 0.9 inches)

Interpretive groups

Land capability classification (irrigated): 6s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Minor Components

Exeter
Percent of map unit: 4 percent
Landform: Fan remnants
Hydric soil rating: No

Colpien
Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Flamen
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

San joaquin
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

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
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 content: 10 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Minor Components

Tujunga

Percent of map unit: 5 percent
Landform: Flood plains
Hydric soil rating: No

Hanford

Percent of map unit: 5 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Grangeville

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Colpien

Percent of map unit: 2 percent

Landform: Fan remnants
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

138—Tujunga loamy sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hp59
Elevation: 210 to 520 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 250 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Tujunga and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tujunga

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

Ap - 0 to 14 inches: loamy sand
C - 14 to 70 inches: stratified coarse sand to loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R017XY903CA - Stream Channels and Floodplains
Hydric soil rating: No

Minor Components

Grangeville
Percent of map unit: 5 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: Yes

Yettem
Percent of map unit: 4 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Akers, saline-sodic
Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Akers
Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

143—Yettem sandy loam, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: hp5g
Elevation: 270 to 530 feet
Mean annual precipitation: 9 to 12 inches
Mean annual air temperature: 62 to 65 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
Yettem and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Yettem

Setting
Landform: Alluvial fans, flood plains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile
Ap - 0 to 13 inches: sandy loam
C - 13 to 63 inches: sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
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 content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 5.0
Available water supply, 0 to 60 inches: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: A
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Minor Components

Grangeville

Percent of map unit: 5 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: Yes

Kimberlina

Percent of map unit: 5 percent
Landform: Flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Colpien

Percent of map unit: 3 percent
Landform: Fan remnants
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Tujunga

Percent of map unit: 2 percent
Landform: Flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

145—Water-perennial

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Water

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: Unranked

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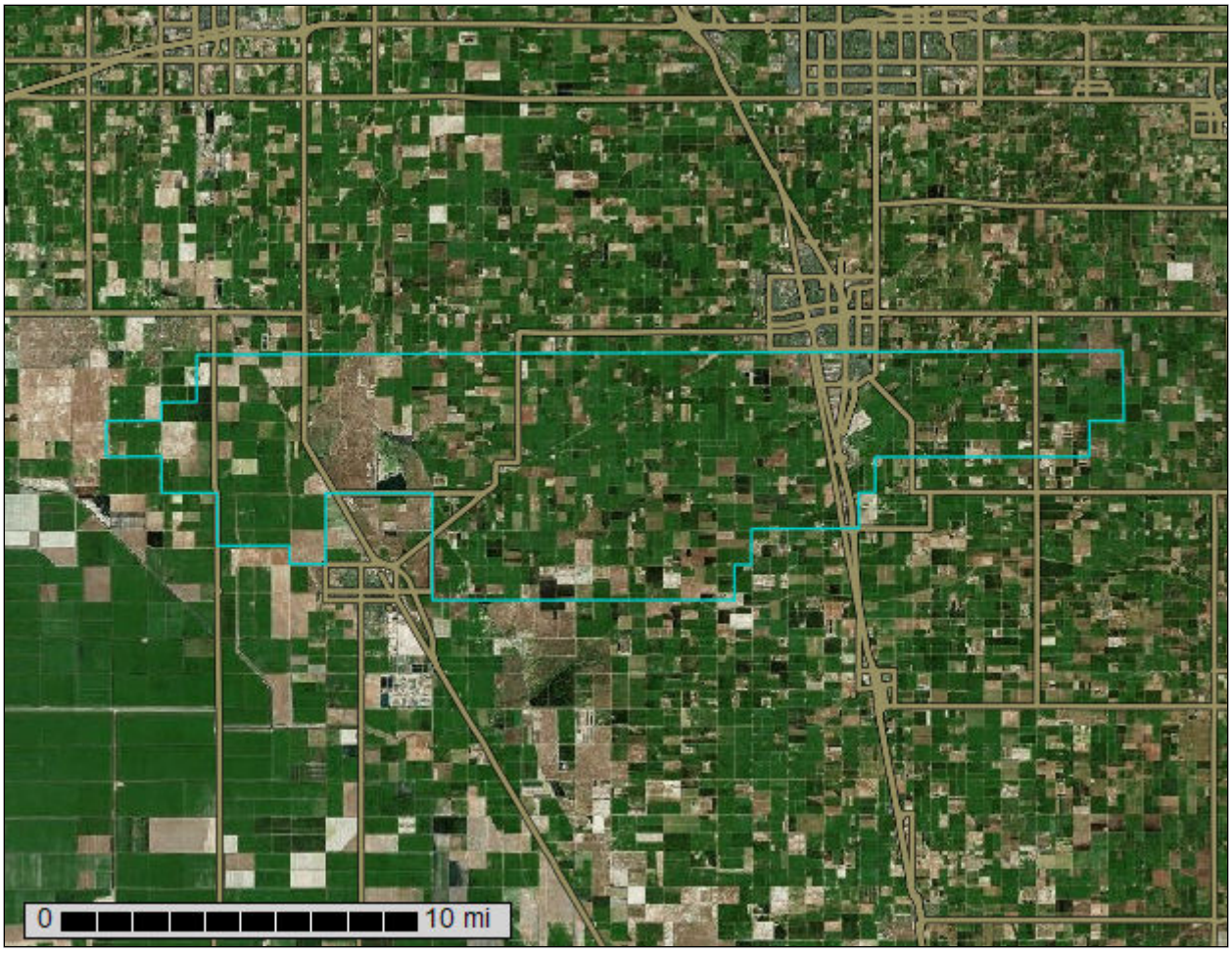
United States Department of Agriculture

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 Kings County, California; and Tulare County, Western Part, California



November 11, 2024

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.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

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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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.

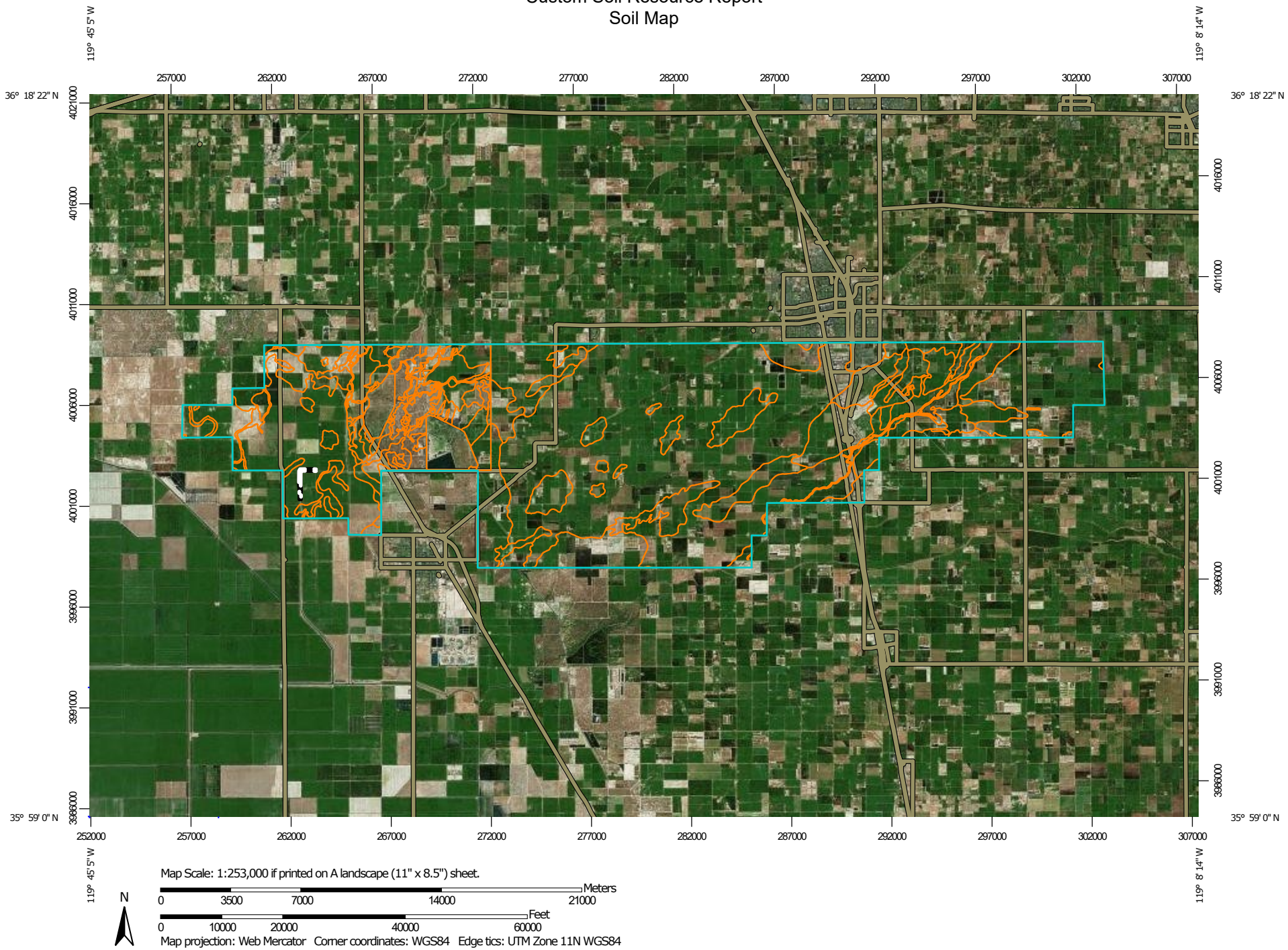
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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 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: Kings County, California
Survey Area Data: Version 20, Aug 30, 2024

Soil Survey Area: Tulare County, Western Part, California
Survey Area Data: Version 18, Aug 30, 2024

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 1, 1999—Dec 31, 2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

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	Armona loam, partially drained	8,483.3	10.0%
104	Cajon sandy loam	9.3	0.0%
104tw	Biggriz-Biggriz, saline-Sodic, complex, 0 to 2 percent slopes	290.0	0.3%
113	Garces loam	1,915.2	2.3%
117	Goldberg loam, drained	3,454.8	4.1%
117tw	Gambogy loam, drained, 0 to 1 percent slopes	1,044.2	1.2%
119	Grangeville sandy loam, saline-alkali	97.3	0.1%
121	Grangeville fine sandy loam, saline-alkali, partially d rained	54.8	0.1%
124	Homeland fine sandy loam, partially drained	114.5	0.1%
130	Kimberlina fine sandy loam, saline-alkali	29.3	0.0%
132	Kimberlina saline alkali-Garces complex	697.2	0.8%
134	Lakeside loam, partially drained	1,093.5	1.3%
135	Lakeside clay loam, drained	626.0	0.7%
136	Lakeside clay, partially drained	7.3	0.0%
140	Melga silt loam	388.9	0.5%
147	Nord fine sandy loam	4.1	0.0%
153	Pitco clay partially drained	338.3	0.4%
154	Pits and Dumps	5.6	0.0%
168	Vanguard sandy loam, partially drained	896.0	1.1%
175	Westcamp loam, partially drained	1,191.5	1.4%
178	Westhaven clay loam, saline-alkali, 0 to 2 percent slop es	315.6	0.4%
179	Whitewolf coarse sandy loam	127.4	0.1%
181	Water	2,096.8	2.5%
Subtotals for Soil Survey Area		**23,280.7**	**27.4%**
Totals for Area of Interest		**85,087.5**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
101	Akers-Akers, saline-Sodic, complex, 0 to 2 percent slopes	260.7	0.3%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
104	Biggriz-Biggriz, saline-Sodic, complex, 0 to 2 percent slopes	6,294.7	7.4%
105	Calgro-Calgro, saline-Sodic, complex, 0 to 2 percent slopes	155.2	0.2%
108	Colpien loam, 0 to 2 percent slopes	33,673.7	39.6%
109	Crosscreek-Kai association, 0 to 2 percent slopes	3,191.3	3.8%
116	Flamen loam, 0 to 2 percent slopes	2,929.1	3.4%
117	Gambogy loam, drained, 0 to 1 percent slopes	4,400.7	5.2%
118	Gambogy-Biggriz, saline-Sodic, association, drained, 0 to 2 percent slopes	1,990.9	2.3%
124	Hanford sandy loam, 0 to 2 percent slopes	142.4	0.2%
130	Nord fine sandy loam, 0 to 2 percent slopes	1,774.2	2.1%
131	Pits	18.7	0.0%
132	Quonal-Lewis association, 0 to 2 percent slopes	5,673.1	6.7%
134	Riverwash	227.1	0.3%
137	Tagus loam, 0 to 2 percent slopes	865.3	1.0%
138	Tujunga loamy sand, 0 to 2 percent slopes	18.9	0.0%
143	Yettem sandy loam, 0 to 2 percent slopes	20.3	0.0%
Subtotals for Soil Survey Area		**61,636.2**	**72.4%**
Totals for Area of Interest		**85,087.5**	**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.

Kings County, California

101—Armona loam, partially drained

Map Unit Setting

National map unit symbol: hhhk
Elevation: 190 to 250 feet
Mean annual precipitation: 7 inches
Mean annual air temperature: 64 degrees F
Frost-free period: 250 to 275 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Armona and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Armona

Setting

Landform: Basin floors
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

Ap - 0 to 14 inches: loam
Cyzg1 - 14 to 41 inches: stratified sandy loam to clay loam
Czg2 - 41 to 60 inches: sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 3 percent
Gypsum, maximum content: 3 percent
Maximum salinity: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 30.0
Available water supply, 0 to 60 inches: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: C/D
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Minor Components

Boggs
Percent of map unit: 5 percent
Landform: Alluvial flats
Hydric soil rating: Yes

Homeland
Percent of map unit: 4 percent
Landform: Basin floors
Hydric soil rating: Yes

Vanguard
Percent of map unit: 3 percent
Landform: Flood plains
Hydric soil rating: Yes

Unnamed, rare flooding
Percent of map unit: 3 percent
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

104—Cajon sandy loam

Map Unit Setting
National map unit symbol: hhhn
Elevation: 320 to 400 feet
Mean annual precipitation: 5 to 7 inches
Mean annual air temperature: 61 to 70 degrees F
Frost-free period: 240 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Cajon and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cajon

Setting
Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile
Ap - 0 to 11 inches: sandy loam

C - 11 to 60 inches: loamy sand
2C - 60 to 70 inches: stratified sand to loamy fine sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Kimberlina

Percent of map unit: 4 percent
Hydric soil rating: No

Cajon, calcareous

Percent of map unit: 4 percent
Hydric soil rating: No

Nord

Percent of map unit: 3 percent
Hydric soil rating: No

Lemoore

Percent of map unit: 1 percent
Landform: Alluvial fans
Hydric soil rating: Yes

Wasco

Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, rare flooding

Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, rare flooding

Percent of map unit: 1 percent
Landform: Sloughs
Hydric soil rating: Yes

104tw—Biggriz-Biggriz, saline-Sodic, complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2dg7w
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
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 content: 10 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 13.0
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s

Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Ecological site: R017XY907CA - Aridic Alkali Desert
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
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 content: 10 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 200.0
Available water supply, 0 to 60 inches: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Minor Components

Gambogy

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Nord

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Lethent
Percent of map unit: 2 percent
Landform: Fan remnants
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Garces
Percent of map unit: 2 percent
Landform: Fan remnants
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Colpien
Percent of map unit: 2 percent
Landform: Fan remnants
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Tujunga
Percent of map unit: 2 percent
Landform: Flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Unnamed, ponded
Percent of map unit: 1 percent
Landform: Depressions
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

113—Garces loam

Map Unit Setting
National map unit symbol: hhhy
Elevation: 200 to 400 feet
Mean annual precipitation: 5 to 8 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 250 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Garces and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Garces

Setting
Landform: Alluvial fans
Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

A - 0 to 9 inches: loam
Btk1 - 9 to 17 inches: clay loam
Btk2 - 17 to 22 inches: sandy clay loam
Ck - 22 to 60 inches: stratified sandy loam to clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 9 to 14 inches to natric
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 30.0
Available water supply, 0 to 60 inches: Very low (about 1.3 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R017XY905CA - Dry Alluvial Fans and Terraces
Hydric soil rating: No

Minor Components

Corona

Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Kimberlina

Percent of map unit: 2 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Excelsior

Percent of map unit: 2 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Goldberg

Percent of map unit: 2 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Wasco

Percent of map unit: 1 percent
Ecological site: R017XY907CA - Aridic Alkali Desert

Hydric soil rating: No

Unnamed, rare flooding

Percent of map unit: 1 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Cajon

Percent of map unit: 1 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Playas

Percent of map unit: 1 percent
Landform: Playas
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Unnamed, rare flooding

Percent of map unit: 1 percent
Landform: Sloughs
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Lakeside

Percent of map unit: 1 percent
Landform: Rims
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

117—Goldberg loam, drained

Map Unit Setting

National map unit symbol: hhj2
Elevation: 200 to 240 feet
Mean annual precipitation: 7 inches
Mean annual air temperature: 64 degrees F
Frost-free period: 250 to 275 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Goldberg and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Goldberg

Setting

Landform: Alluvial flats
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear

Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

A - 0 to 1 inches: loam
Bt - 1 to 6 inches: clay loam
Btk - 6 to 32 inches: clay
Btg - 32 to 38 inches: clay loam
Cg - 38 to 60 inches: stratified loamy sand to clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 6 to 24 inches to natric
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 42.0
Available water supply, 0 to 60 inches: Very low (about 1.0 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: D
Ecological site: R017XY905CA - Dry Alluvial Fans and Terraces
Hydric soil rating: Yes

Minor Components

Cajon

Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Goldberg

Percent of map unit: 2 percent
Landform: Alluvial flats
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Garces

Percent of map unit: 2 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Whitewolf

Percent of map unit: 2 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Kimberlina

Percent of map unit: 2 percent
Ecological site: R017XY907CA - Aridic Alkali Desert

Hydric soil rating: No

Lakeside

Percent of map unit: 2 percent
Landform: Basin floors
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Nord

Percent of map unit: 2 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

117tw—Gambogy loam, drained, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2dg7y
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: Alluvial fans, flood plains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Convex, linear
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
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 content: 3 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Hanford

Percent of map unit: 3 percent
Landform: Alluvial fans, 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: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Yettem

Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
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: Alluvial fans, flood plains
Hydric soil rating: No

119—Grangeville sandy loam, saline-alkali

Map Unit Setting

National map unit symbol: hhj4

Elevation: 10 to 1,800 feet
Mean annual precipitation: 8 to 16 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 250 to 275 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Grangeville and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Grangeville

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous rock

Typical profile

Ap - 0 to 6 inches: sandy loam
C1 - 6 to 21 inches: sandy loam
C2 - 21 to 63 inches: stratified loamy sand to silt loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 3 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: B/D
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: Yes

Minor Components

Boggs

Percent of map unit: 3 percent
Landform: Alluvial flats
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Armona

Percent of map unit: 3 percent

Landform: Basin floors
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Lemoore
Percent of map unit: 2 percent
Landform: Basin floors
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Vanguard
Percent of map unit: 2 percent
Landform: Flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Gepford
Percent of map unit: 2 percent
Landform: Basin floors
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Lakeside
Percent of map unit: 2 percent
Landform: Basin floors
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Nord
Percent of map unit: 1 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

121—Grangeville fine sandy loam, saline-alkali, partially d rained

Map Unit Setting
National map unit symbol: hhj6
Elevation: 210 to 290 feet
Mean annual precipitation: 7 to 8 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 250 to 275 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Grangeville and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Grangeville

Setting
Landform: Flood plains, alluvial fans

Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

A - 0 to 10 inches: fine sandy loam
C - 10 to 60 inches: stratified sandy loam to fine sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 20.0
Available water supply, 0 to 60 inches: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: B/D
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Minor Components

Nord

Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Grangeville

Percent of map unit: 3 percent
Landform: Alluvial fans
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Whitewolf

Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Vanguard

Percent of map unit: 3 percent
Landform: Flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Kimberlina

Percent of map unit: 3 percent

Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

124—Homeland fine sandy loam, partially drained

Map Unit Setting

National map unit symbol: hhj9
Elevation: 180 to 220 feet
Mean annual precipitation: 6 inches
Mean annual air temperature: 64 degrees F
Frost-free period: 255 to 270 days
Farmland classification: Not prime farmland

Map Unit Composition

Homeland and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Homeland

Setting

Landform: Basin floors
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

Ap - 0 to 8 inches: fine sandy loam
C1 - 8 to 15 inches: stratified sandy loam to very fine sandy loam
C2 - 15 to 60 inches: stratified loamy sand to very fine sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 60.0
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 7w

Hydrologic Soil Group: B/D
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Minor Components

Westcamp
Percent of map unit: 3 percent
Landform: Basin floors
Hydric soil rating: Yes

Houser
Percent of map unit: 3 percent
Landform: Basin floors
Hydric soil rating: Yes

Tulare
Percent of map unit: 3 percent
Landform: Basin floors
Hydric soil rating: Yes

Armona
Percent of map unit: 3 percent
Landform: Basin floors
Hydric soil rating: Yes

Lakeside
Percent of map unit: 2 percent
Landform: Basin floors
Hydric soil rating: Yes

Rambla
Percent of map unit: 1 percent
Hydric soil rating: No

130—Kimberlina fine sandy loam, saline-alkali

Map Unit Setting
National map unit symbol: hhjh
Elevation: 190 to 3,500 feet
Mean annual precipitation: 4 to 8 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 210 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Kimberlina and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kimberlina

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

Ap - 0 to 8 inches: fine sandy loam
C - 8 to 60 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 25.0
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Wasco

Percent of map unit: 2 percent
Hydric soil rating: No

Nord

Percent of map unit: 2 percent
Hydric soil rating: No

Excelsior

Percent of map unit: 2 percent
Hydric soil rating: No

Kimberlina, sandy substratum

Percent of map unit: 2 percent
Hydric soil rating: No

Garces

Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, rare flooding
Percent of map unit: 1 percent
Hydric soil rating: No

Cajon
Percent of map unit: 1 percent
Hydric soil rating: No

Melga
Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, rare flooding
Percent of map unit: 1 percent
Landform: Sloughs
Hydric soil rating: Yes

Yound
Percent of map unit: 1 percent
Hydric soil rating: No

Remnoy
Percent of map unit: 1 percent
Hydric soil rating: No

132—Kimberlina saline alkali-Garces complex

Map Unit Setting
National map unit symbol: hhjk
Elevation: 190 to 3,500 feet
Mean annual precipitation: 4 to 8 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 210 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition
Kimberlina and similar soils: 50 percent
Garces and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kimberlina

Setting
Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

Ap - 0 to 8 inches: fine sandy loam
C - 8 to 60 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 25.0
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Description of Garces

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

A - 0 to 9 inches: loam
Btk1 - 9 to 17 inches: clay loam
Btk2 - 17 to 22 inches: sandy clay loam
Ck - 22 to 60 inches: stratified sandy loam to clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 9 inches to natric
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 30.0
Available water supply, 0 to 60 inches: Very low (about 1.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Cajon

Percent of map unit: 4 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Lakeside

Percent of map unit: 3 percent
Landform: Rims
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Goldberg

Percent of map unit: 3 percent
Landform: Alluvial flats
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Lemoore

Percent of map unit: 2 percent
Landform: Alluvial flats
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Unnamed, rare flooding

Percent of map unit: 1 percent
Landform: Sloughs
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Unnamed, rare flooding

Percent of map unit: 1 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Nord

Percent of map unit: 1 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

134—Lakeside loam, partially drained

Map Unit Setting

National map unit symbol: hhjm
Elevation: 170 to 260 feet
Mean annual precipitation: 8 inches
Mean annual air temperature: 64 degrees F
Frost-free period: 190 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Lakeside and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lakeside

Setting

Landform: Rims on basin floors
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

Ap - 0 to 17 inches: loam
Czg - 17 to 60 inches: stratified sandy loam to clay

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 35.0
Available water supply, 0 to 60 inches: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: C/D
Ecological site: R017XY907CA - Aridic Alkali Desert

Hydric soil rating: Yes

Minor Components

Armona
Percent of map unit: 4 percent
Landform: Basin floors
Hydric soil rating: Yes

Westcamp
Percent of map unit: 2 percent
Landform: Basin floors
Hydric soil rating: Yes

Goldberg
Percent of map unit: 2 percent
Landform: Alluvial flats
Hydric soil rating: Yes

Lakeside
Percent of map unit: 2 percent
Landform: Basin floors
Hydric soil rating: Yes

Grangeville
Percent of map unit: 2 percent
Landform: Alluvial fans
Hydric soil rating: Yes

Homeland
Percent of map unit: 2 percent
Landform: Basin floors
Hydric soil rating: Yes

Unnamed, rare flooding
Percent of map unit: 1 percent
Hydric soil rating: No

135—Lakeside clay loam, drained

Map Unit Setting
National map unit symbol: hhjn
Elevation: 170 to 260 feet
Mean annual precipitation: 8 inches
Mean annual air temperature: 64 degrees F
Frost-free period: 260 to 275 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Lakeside and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lakeside

Setting

Landform: Rims on basin floors
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

Ap - 0 to 17 inches: loam
Czg - 17 to 60 inches: stratified sandy loam to clay

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 35.0
Available water supply, 0 to 60 inches: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: C
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Minor Components

Excelsior

Percent of map unit: 4 percent
Hydric soil rating: No

Grangeville

Percent of map unit: 3 percent
Landform: Alluvial fans
Hydric soil rating: Yes

Garces

Percent of map unit: 2 percent
Hydric soil rating: No

Corona

Percent of map unit: 2 percent
Hydric soil rating: No

Kimberlina

Percent of map unit: 2 percent
Hydric soil rating: No

Melga

Percent of map unit: 2 percent
Hydric soil rating: No

136—Lakeside clay, partially drained

Map Unit Setting

National map unit symbol: hhjp
Elevation: 170 to 260 feet
Mean annual precipitation: 8 inches
Mean annual air temperature: 64 degrees F
Frost-free period: 260 to 275 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Lakeside and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lakeside

Setting

Landform: Rims on basin floors
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

Ap - 0 to 12 inches: clay
Czg - 12 to 60 inches: stratified sandy loam to clay

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 35.0
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): 2w

Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: C/D
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Minor Components

Goldberg
Percent of map unit: 4 percent
Landform: Alluvial flats
Hydric soil rating: Yes

Lakeside
Percent of map unit: 4 percent
Landform: Basin floors
Hydric soil rating: Yes

Grangeville
Percent of map unit: 4 percent
Landform: Alluvial fans
Hydric soil rating: Yes

Unnamed, rare flooding
Percent of map unit: 3 percent
Hydric soil rating: No

140—Melga silt loam

Map Unit Setting
National map unit symbol: hhjt
Elevation: 220 to 280 feet
Mean annual precipitation: 2 inches
Mean annual air temperature: 63 degrees F
Frost-free period: 250 to 275 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Melga and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Melga

Setting
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

A - 0 to 4 inches: silt loam
Btk - 4 to 18 inches: silty clay loam
Ck - 18 to 26 inches: clay loam
2C - 26 to 60 inches: stratified fine sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 10 to 20 inches to duripan
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 70.0
Available water supply, 0 to 60 inches: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: D
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Minor Components

Remnoy

Percent of map unit: 2 percent
Hydric soil rating: No

Corona

Percent of map unit: 2 percent
Hydric soil rating: No

Garces

Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed, rare flooding

Percent of map unit: 2 percent
Hydric soil rating: No

Excelsior

Percent of map unit: 2 percent
Hydric soil rating: No

Youd

Percent of map unit: 2 percent
Hydric soil rating: No

Lakeside

Percent of map unit: 1 percent
Landform: Rims
Hydric soil rating: Yes

Unnamed, rare flooding

Percent of map unit: 1 percent
Landform: Sloughs
Hydric soil rating: Yes

Kimberlina

Percent of map unit: 1 percent
Hydric soil rating: No

147—Nord fine sandy loam

Map Unit Setting

National map unit symbol: hhk1
Elevation: 210 to 290 feet
Mean annual precipitation: 8 to 9 inches
Mean annual air temperature: 61 to 62 degrees F
Frost-free period: 250 to 260 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Nord and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nord

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock and/or igneous rock

Typical profile

A - 0 to 18 inches: fine sandy loam
C - 18 to 72 inches: stratified sandy loam to loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Lakeside

Percent of map unit: 3 percent
Landform: Rims
Hydric soil rating: Yes

Grangeville

Percent of map unit: 3 percent
Landform: Alluvial fans
Hydric soil rating: Yes

Cajon

Percent of map unit: 2 percent
Hydric soil rating: No

Nor, saline-alkali

Percent of map unit: 2 percent
Hydric soil rating: No

Kimberlina

Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed, rare flooding

Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, rare flooding

Percent of map unit: 1 percent
Landform: Sloughs
Hydric soil rating: Yes

Whitewolf

Percent of map unit: 1 percent
Hydric soil rating: No

153—Pitco clay partially drained

Map Unit Setting

National map unit symbol: hhk7
Elevation: 190 to 210 feet
Mean annual precipitation: 7 inches
Mean annual air temperature: 64 degrees F

Frost-free period: 260 to 275 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Pitco and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pitco

Setting

Landform: Rims on basin floors
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

A - 0 to 23 inches: clay
2Cyzg - 23 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: None
Gypsum, maximum content: 3 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 30.0
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: D
Ecological site: R017XY901CA - Clayey Basin Group
Hydric soil rating: Yes

Minor Components

Gepford

Percent of map unit: 4 percent
Landform: Basin floors
Hydric soil rating: Yes

Armona

Percent of map unit: 4 percent
Landform: Basin floors
Hydric soil rating: Yes

Tulare

Percent of map unit: 4 percent

Landform: Basin floors
Hydric soil rating: Yes

Vanguard
Percent of map unit: 3 percent
Landform: Flood plains
Hydric soil rating: Yes

154—Pits and Dumps

Map Unit Setting
National map unit symbol: hhk8
Elevation: 200 to 3,400 feet
Mean annual precipitation: 5 to 7 inches
Mean annual air temperature: 64 degrees F
Frost-free period: 260 to 275 days
Farmland classification: Not prime farmland

Map Unit Composition
Pits: 46 percent
Dumps: 44 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pits

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: No

Description of Dumps

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: No

Minor Components

Delgado
Percent of map unit: 2 percent
Hydric soil rating: No

Cajon
Percent of map unit: 2 percent
Hydric soil rating: No

Nord
Percent of map unit: 1 percent
Hydric soil rating: No

Panoche
Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, rare flooding
Percent of map unit: 1 percent
Landform: Drainageways
Hydric soil rating: Yes

Henneke
Percent of map unit: 1 percent
Hydric soil rating: No

Kimberlina
Percent of map unit: 1 percent
Hydric soil rating: No

Wasco
Percent of map unit: 1 percent
Hydric soil rating: No

168—Vanguard sandy loam, partially drained

Map Unit Setting
National map unit symbol: hhkq
Elevation: 200 to 250 feet
Mean annual precipitation: 7 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 250 to 260 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Vanguard and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Vanguard

Setting
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous rock

Typical profile
Ap - 0 to 16 inches: sandy loam
C - 16 to 60 inches: stratified fine sandy loam to sandy clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 3 percent
Maximum salinity: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 50.0
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: B/D
Ecological site: R017XY903CA - Stream Channels and Floodplains
Hydric soil rating: Yes

Minor Components

Armona

Percent of map unit: 4 percent
Landform: Basin floors
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Boggs

Percent of map unit: 3 percent
Landform: Alluvial flats
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Grangeville

Percent of map unit: 3 percent
Landform: Alluvial fans
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Gepford

Percent of map unit: 3 percent
Landform: Basin floors
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Lakeside

Percent of map unit: 2 percent
Landform: Basin floors
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

175—Westcamp loam, partially drained

Map Unit Setting

National map unit symbol: hhky
Elevation: 190 to 220 feet
Mean annual precipitation: 6 to 7 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 260 to 275 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Westcamp and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Westcamp

Setting

Landform: Rims on basin floors
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

Ap - 0 to 10 inches: loam
2C1 - 10 to 37 inches: stratified fine sandy loam to silty clay loam
2C2 - 37 to 72 inches: stratified silty clay loam to clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 3 percent
Gypsum, maximum content: 3 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 13.0
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: D

Ecological site: R017XY901CA - Clayey Basin Group
Hydric soil rating: Yes

Minor Components

Houser
Percent of map unit: 4 percent
Landform: Basin floors
Hydric soil rating: Yes

Boggs
Percent of map unit: 3 percent
Landform: Alluvial flats
Hydric soil rating: Yes

Armona
Percent of map unit: 3 percent
Landform: Basin floors
Hydric soil rating: Yes

Grangeville
Percent of map unit: 2 percent
Landform: Alluvial fans
Hydric soil rating: Yes

Lakeside
Percent of map unit: 2 percent
Landform: Basin floors
Hydric soil rating: Yes

Rambla
Percent of map unit: 1 percent
Hydric soil rating: No

178—Westhaven clay loam, saline-alkali, 0 to 2 percent slop es

Map Unit Setting
National map unit symbol: hhl1
Elevation: 200 to 400 feet
Mean annual precipitation: 6 to 8 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 240 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Westhaven and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Westhaven

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

Ap - 0 to 10 inches: clay loam
C - 10 to 40 inches: stratified fine sandy loam to clay
2C - 40 to 60 inches: stratified silty clay loam to silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Minor Components

Excelsior

Percent of map unit: 4 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Lethent

Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Westcamp

Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Westhaven, loam

Percent of map unit: 3 percent
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Unnamed, rare flooding

Percent of map unit: 2 percent
Landform: Sloughs
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

179—Whitewolf coarse sandy loam

Map Unit Setting

National map unit symbol: hhl2
Elevation: 200 to 4,000 feet
Mean annual precipitation: 6 to 9 inches
Mean annual air temperature: 64 degrees F
Frost-free period: 200 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition

Whitewolf and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Whitewolf

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

Ap - 0 to 10 inches: coarse sandy loam
C - 10 to 60 inches: sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): 3s

Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Cajon
Percent of map unit: 4 percent
Hydric soil rating: No

Wasco
Percent of map unit: 4 percent
Hydric soil rating: No

Kimberlina
Percent of map unit: 4 percent
Hydric soil rating: No

Unnamed, rare flooding
Percent of map unit: 3 percent
Landform: Sloughs
Hydric soil rating: Yes

181—Water

Map Unit Composition
Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Water

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: Unranked

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
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 content: 10 percent
Gypsum, maximum content: 2 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Ecological site: R017XY907CA - Aridic Alkali Desert
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
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 content: 10 percent
Gypsum, maximum content: 2 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 30.0
Available water supply, 0 to 60 inches: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Minor Components

Tujunga

Percent of map unit: 3 percent
Landform: Flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Colpien

Percent of map unit: 3 percent
Landform: Fan remnants
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Yettem

Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Tagus
Percent of map unit: 2 percent
Landform: Fan remnants
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Grangeville
Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Hanford
Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Unnamed, ponded
Percent of map unit: 1 percent
Landform: Depressions
Ecological site: R017XY907CA - Aridic Alkali Desert
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
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 content: 10 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 13.0
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Ecological site: R017XY907CA - Aridic Alkali Desert
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
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 content: 10 percent
Gypsum, maximum content: 1 percent

Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 200.0
Available water supply, 0 to 60 inches: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Minor Components

Nord

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Gambogy

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Tujunga

Percent of map unit: 2 percent
Landform: Flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Lethent

Percent of map unit: 2 percent
Landform: Fan remnants
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Colpien

Percent of map unit: 2 percent
Landform: Fan remnants
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Garces

Percent of map unit: 2 percent
Landform: Fan remnants
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Unnamed, ponded

Percent of map unit: 1 percent
Landform: Depressions
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

105—Calgro-Calgro, saline-Sodic, complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hp47
Elevation: 250 to 480 feet
Mean annual precipitation: 8 to 12 inches
Mean annual air temperature: 62 to 65 degrees F
Frost-free period: 250 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Calgro and similar soils: 60 percent
Calgro, saline-sodic, and similar soils: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Calgro

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 granite

Typical profile

Ap - 0 to 7 inches: sandy loam
Bw - 7 to 25 inches: sandy loam
2Bkqm - 25 to 33 inches: cemented
2Bkq - 33 to 53 inches: gravelly loamy sand
3Bkqm - 53 to 60 inches: cemented

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to duripan
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Description of Calgro, 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 granite

Typical profile

Ap - 0 to 8 inches: sandy loam
Bw - 8 to 24 inches: sandy loam
2Bkqm - 24 to 33 inches: cemented
2Bkq - 33 to 52 inches: gravelly loamy sand
3Bkqm - 52 to 60 inches: cemented

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to duripan
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum content: 4 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 100.0
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Minor Components

Colpien

Percent of map unit: 5 percent
Landform: Fan remnants
Hydric soil rating: No

Grangeville

Percent of map unit: 4 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Tujunga
Percent of map unit: 3 percent
Landform: Flood plains
Hydric soil rating: No

Exeter
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

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 content: 5 percent
Maximum salinity: Nonsaline to slightly saline (0.5 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: High (about 10.7 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: C
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Hanford

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Biggriz

Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Gambogy

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
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: Alluvial fans, flood plains
Hydric soil rating: No

Akers, saline-sodic

Percent of map unit: 2 percent
Landform: Fan remnants
Hydric soil rating: No

109—Crosscreek-Kai association, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hp4c
Elevation: 230 to 400 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: Farmland of statewide importance

Map Unit Composition

Crosscreek and similar soils: 70 percent
Kai and similar soils: 15 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Crosscreek

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: Formed by the chemical and mechanical alteration of the kai series which originally formed in alluvium derived from granitic rock

Typical profile

Ap1 - 0 to 11 inches: loam
Ap2 - 11 to 17 inches: gravelly loam
Ap3 - 17 to 55 inches: sandy loam
2Bkqmb - 55 to 60 inches: cemented

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 40 to 60 inches to duripan
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.01 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Gypsum, maximum content: 5 percent
Maximum salinity: Nonsaline to moderately saline (1.0 to 12.0 mmhos/cm)
Sodium adsorption ratio, maximum: 13.0
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Description of Kai

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

A - 0 to 6 inches: loam
Btkn - 6 to 39 inches: loam
Bkqm - 39 to 46 inches: cemented
Btq - 46 to 65 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 4 to 12 inches to natric; 20 to 40 inches to duripan
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.01 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Nonsaline to strongly saline (1.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 80.0
Available water supply, 0 to 60 inches: Very low (about 0.9 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Quonal

Percent of map unit: 5 percent
Landform: Fan remnants
Hydric soil rating: No

Exeter

Percent of map unit: 4 percent
Landform: Fan remnants
Hydric soil rating: No

Calgro, saline-sodic
Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Hanford
Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Unnamed, ponded
Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

116—Flamen loam, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: hp4l
Elevation: 260 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
Flamen and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Flamen

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
Ap1 - 0 to 17 inches: loam
Ap2 - 17 to 28 inches: loam
Btk - 28 to 43 inches: loam
2Btkqm - 43 to 72 inches: cemented

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: 40 to 60 inches to duripan

Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Minor Components

Exeter

Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

San joaquin

Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Hanford

Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Calgro

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

Centerville

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

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: Alluvial fans, flood plains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Convex, linear
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
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 content: 3 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s

Hydrologic Soil Group: C
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Grangeville
Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Colpien
Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Hanford
Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
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: Alluvial fans, flood plains
Hydric soil rating: No

Yettem
Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

118—Gambogy-Biggriz, saline-Sodic, association, drained, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: hp4n
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: 50 percent
Biggriz and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gambogy

Setting

Landform: Alluvial fans, flood plains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
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 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly 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 content: 3 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

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

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 content: 10 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 200.0
Available water supply, 0 to 60 inches: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Colpien

Percent of map unit: 5 percent
Landform: Fan remnants
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Hanford

Percent of map unit: 4 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Grangeville

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Tujunga

Percent of map unit: 1 percent
Landform: Flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Nord

Percent of map unit: 1 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Unnamed, ponded

Percent of map unit: 1 percent
Landform: Depressions
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

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: Alluvial fans, flood plains
Landform position (two-dimensional): Footslope, toeslope
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
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 content: 2 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 7.0
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 3c

Hydrologic Soil Group: A
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Exeter
Percent of map unit: 5 percent
Landform: Fan remnants
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Tujunga
Percent of map unit: 5 percent
Landform: Flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Calgro
Percent of map unit: 3 percent
Landform: Fan remnants
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Yettem
Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

130—Nord fine sandy loam, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: hp51
Elevation: 190 to 520 feet
Mean annual precipitation: 8 to 12 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 250 to 275 days
Farmland classification: Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition
Nord and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nord

Setting
Landform: Alluvial fans, flood plains
Landform position (two-dimensional): Footslope, toeslope

Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Convex, linear
Parent material: Alluvium derived from mixed

Typical profile

Ap - 0 to 11 inches: fine sandy loam
C1 - 11 to 38 inches: stratified sandy loam to loam
C2 - 38 to 50 inches: stratified loamy coarse sand to coarse sandy loam
2Btb - 50 to 72 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches; More than 80 inches
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 content: 4 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 10.0
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Ecological site: R017XY906CA - Non-Alkali San Joaquin Valley Desert
Hydric soil rating: No

Minor Components

Grangeville, saline-sodic

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: Yes

Hanford

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Tujunga

Percent of map unit: 3 percent
Landform: Flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Tagus

Percent of map unit: 2 percent
Landform: Fan remnants
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Akers

Percent of map unit: 2 percent
Landform: Fan remnants
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Colpien

Percent of map unit: 2 percent
Landform: Fan remnants
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

131—Pits

Map Unit Composition

Pits: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pits

Setting

Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

132—Quonal-Lewis association, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hp53
Elevation: 280 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: Farmland of statewide importance

Map Unit Composition

Quonal and similar soils: 70 percent
Lewis and similar soils: 15 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Quonal

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: Formed by the chemical and mechanical alteration of the lewis series which originally formed in alluvium from mixed rock sources

Typical profile

Ap1 - 0 to 7 inches: silty clay
Ap2 - 7 to 16 inches: gravelly clay
Ap3 - 16 to 41 inches: gravelly clay
2Bkqmb - 41 to 44 inches: duripan
2Bkb - 44 to 62 inches: stratified sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 40 to 60 inches to duripan
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.01 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Gypsum, maximum content: 5 percent
Maximum salinity: Nonsaline to moderately saline (0.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 50.0
Available water supply, 0 to 60 inches: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Description of Lewis

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 mixed

Typical profile

A - 0 to 5 inches: silty clay loam
Btkn - 5 to 25 inches: clay
2Bkqm - 25 to 39 inches: cemented
3Bkq - 39 to 60 inches: stratified sandy loam to clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 2 to 6 inches to natric; 20 to 40 inches to duripan
Drainage class: Moderately well drained
Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.01 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum content: 8 percent
Maximum salinity: Moderately saline to strongly saline (8.0 to 40.0 mmhos/cm)
Sodium adsorption ratio, maximum: 100.0
Available water supply, 0 to 60 inches: Very low (about 0.9 inches)

Interpretive groups

Land capability classification (irrigated): 6s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Minor Components

Exeter

Percent of map unit: 4 percent
Landform: Fan remnants
Hydric soil rating: No

Colpien

Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Flamen

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

San joaquin

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
Ecological site: R017XY903CA - Stream Channels and Floodplains
Hydric soil rating: Yes

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
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 content: 10 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Minor Components

Tujunga

Percent of map unit: 5 percent
Landform: Flood plains
Hydric soil rating: No

Hanford

Percent of map unit: 5 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Grangeville

Percent of map unit: 3 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

Colpien

Percent of map unit: 2 percent
Landform: Fan remnants
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: No

138—Tujunga loamy sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hp59
Elevation: 210 to 520 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 250 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Tujunga and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tujunga

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

Ap - 0 to 14 inches: loamy sand
C - 14 to 70 inches: stratified coarse sand to loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R017XY903CA - Stream Channels and Floodplains
Hydric soil rating: No

Minor Components

Grangeville
Percent of map unit: 5 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: Yes

Yettem
Percent of map unit: 4 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Akers, saline-sodic
Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Akers
Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

143—Yettem sandy loam, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: hp5g
Elevation: 270 to 530 feet
Mean annual precipitation: 9 to 12 inches
Mean annual air temperature: 62 to 65 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
Yettem and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Yettem

Setting
Landform: Alluvial fans, flood plains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile
Ap - 0 to 13 inches: sandy loam
C - 13 to 63 inches: sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
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 content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 5.0
Available water supply, 0 to 60 inches: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: A
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Minor Components

Grangeville

Percent of map unit: 5 percent
Landform: Alluvial fans, flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: Yes

Kimberlina

Percent of map unit: 5 percent
Landform: Flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Colpien

Percent of map unit: 3 percent
Landform: Fan remnants
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Tujunga

Percent of map unit: 2 percent
Landform: Flood plains
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

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Appendix B– Cultural Resources Information

Kaweah Delta Water Conservation District

River and Stream Maintenance

Cultural Resources Information Summary

Name of Information Center, CSU location, California Historical Resources Information System: Record Search 25-033, dated February 3, 2025.

- There have been 448 previous cultural resource studies conducted within the project area.
- There are 781 cultural recorded resources 20 known but unrecorded resources within the project area.
- There are 31 recorded resources within the project area that are listed in the National Register of Historic Places.
- There are 40 recorded resources within the project area listed in the California Register of Historical Resources.

Native American Heritage Commission (NAHC): Sacred Lands File & Native American Contacts List Request, dated January 22, 2025.

- A Record Search of the NAHC Sacred Lands File was completed for the Area of Potential Effect (APE) with positive results.
- A list of ten tribal contacts from six Native American Tribes from was provided, and letters to the ten tribal contacts were then mailed out January 28, 2025.
- Two (2) responses were received by the Native American representatives.
    - On January 30, 2025, David Alvarez, Tribal Chairman for the Traditional Choinumni Tribe responded by stating that the Project is out of their historical land use and would be unable to comment.
    - On February 12, 2025, Samantha McCarty, Cultural Specialist II with the Santa Rosa Rancheria Tachi Yokut Tribe requested to schedule a meeting with the District and Provost & Pritchard (P&P) staff to discuss the Project in more detail.
        - On March 3, 2025, a meeting was held to discuss the Project in more detail. Participants included one member of the Santa Rosa Rancheria Tachi Yokut Tribe, one member of the District, and three staff members of P&P.
        - During this meeting, the Santa Rosa Rancheria Tachi Yokut Tribe addressed their concerns regarding potential project disturbance to places of spiritual, sacred activity or traditional use or other resources of importance. Due to the large Project APE and the fact that no cultural resources have been identified during prior and existing maintenance activities, the District will implement appropriate measures to satisfy and protect cultural and tribal cultural resources. The District will include standard mitigation measures, as required under State law to protect cultural and tribal cultural resources.

AB 52 Consultation pursuant to Public Resource Code Section 21080.3.1

- As of the date of this report, Kaweah Delta Water Conservation District has not received any written correspondence from a Tribe pursuant to Public Resources Code Section 21080.3.1 requesting notification of a proposed project.

CHRIS – Record Search Results

California Historical Resources Information System

Fresno
Inyo
Kern
Kings
Madera
Tulare

Southern San Joaquin Valley Information Center
California State University, Bakersfield
Mail Stop: 72 DOB
9001 Stockdale Highway
Bakersfield, California 93311-1022
(661) 654-2289
Email: ssjvic@csub.edu
Website: www.csub.edu/ssjvic

To: Jackie Lancaster
Provost & Pritchard Consulting Group
400 E. Main Street, Suite 300
Visalia, CA 93291

Record Search 25-033

Date: February 3, 2025

Re: Kaweah Delta Water Conservation District – River and Stream Maintenance Project 1225-25-002 Phase ENV

County: Kings, Tulare

Map(s): Burris Park, Cairns Corner, Corcoran, El Rico Ranch, Exeter, Goshen, Guernsey, Hanford, Ivanhoe, Monson, Paige, Remnoy, Rocky Hill, Taylor Weir, Tipton, Traver, Tulare, Visalia, Waukena, Woodlake 7.5'

CULTURAL RESOURCES RECORDS SEARCH

The California Office of Historic Preservation (OHP) contracts with the California Historical Resources Information System's (CHRIS) regional Information Centers (ICs) to maintain information in the CHRIS inventory and make it available to local, state, and federal agencies, cultural resource professionals, Native American tribes, researchers, and the public. Recommendations made by IC coordinators or their staff regarding the interpretation and application of this information are advisory only. Such recommendations do not necessarily represent the evaluation or opinion of the State Historic Preservation Officer in carrying out the OHP's regulatory authority under federal and state law.

The following are the results of a search of the cultural resource files at the Southern San Joaquin Valley Information Center. These files include known and recorded cultural resources sites, inventory and excavation reports filed with this office, and resources listed on the National Register of Historic Places, the OHP Built Environment Resources Directory, California State Historical Landmarks, California Register of Historical Resources, California Inventory of Historic Resources, and California Points of Historical Interest. Due to processing delays and other factors, not all of the historical resource reports and resource records that have been submitted to the OHP are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for historical resource management work in the search area.

PRIOR CULTURAL RESOURCE STUDIES CONDUCTED WITHIN THE PROJECT AREA

According to the information in our files, there have been 448 previous cultural resource studies completed within the project area. A list is enclosed.

KNOWN/RECORDED CULTURAL RESOURCES WITHIN THE PROJECT AREA

According to the information in our files, there are 781 recorded cultural resources and 20 known but unrecorded resources within the project area. A list is enclosed.

There are 31 recorded resources within the project area that are listed in the National Register of Historic Places. There are 40 recorded resources within the project area listed in the California Register of Historical Resources. A list of all listed and eligible to be listed resources is enclosed. Additionally, there are three California State Historic Landmark resources within the project area: CHL-410, CHL-471, and CHL-934. There are no other recorded cultural resources within the project area that are listed in the National Register of Historic Places, the California Register of Historical Resources, the California Points of Historical Interest, California Inventory of Historic Resources, or the California State Historic Landmarks.

COMMENTS AND RECOMMENDATIONS

We understand this project consists of routine channel maintenance with the Kaweah River system in Tulare and Kings Counties for the purpose of flood control. Please note waterways and their surrounding regions are considered extremely sensitive for cultural resources, as indigenous people utilized these areas as permanent villages, temporary camps, and task specific sites. Due to the size of this project area, we cannot make site specific recommendations. Therefore, we recommend a qualified, professional consultant be retained to obtain the necessary cultural resource information for specific work areas from our office. They will then be able to make further recommendations for needed cultural resource investigation. A list of qualified consultants can be found at www.chrisinfo.org.

We also recommend that you contact the Native American Heritage Commission in Sacramento. They will provide you with a current list of Native American individuals/organizations that can assist you with information regarding cultural resources that may not be included in the CHRIS Inventory and that may be of concern to the Native groups in the area. The Commission can consult their "Sacred Lands Inventory" file to determine what sacred resources, if any, exist within this project area and the way in which these resources might be managed. Finally, please consult with the lead agency on this project to determine if any other cultural resource investigation is required. If you need any additional information or have any questions or concerns, please contact our office at (661) 654-2289.

By:

Celeste M. Thomson, Coordinator **Date**: February 3, 2025

Please note that invoices for Information Center services will be sent under separate cover from the California State University, Bakersfield Accounting Office.

Reports in PA:							
KI-00005	TU-00103	TU-00245	TU-00961	TU-01069	TU-01177	TU-01311	TU-01482
KI-00016	TU-00121	TU-00246	TU-00962	TU-01069	TU-01178	TU-01312	TU-01483
KI-00017	TU-00128	TU-00247	TU-00963	TU-01069	TU-01179	TU-01314	TU-01484
KI-00023	TU-00129	TU-00267	TU-00964	TU-01069	TU-01180	TU-01315	TU-01499
KI-00028 (TU-00102)	TU-00134	TU-00297	TU-00981	TU-01069	TU-01183	TU-01318	TU-01500
KI-00064	TU-00136	TU-00313	TU-00987	TU-01069	TU-01184	TU-01319	TU-01501
KI-00089 (TU-01010)	TU-00137	TU-00324	TU-01001	TU-01069	TU-01187	TU-01319	TU-01509
KI-00094	TU-00138	TU-00370	TU-01003	TU-01070	TU-01194	TU-01321	TU-01512
KI-00101	TU-00139	TU-00404	TU-01005	TU-01071	TU-01195	TU-01324	TU-01517
KI-00109 (TU-01081)	TU-00140	TU-00442	TU-01006	TU-01073	TU-01196	TU-01327	TU-01528
KI-00110 (TU-01082)	TU-00141	TU-00444	TU-01007	TU-01074	TU-01199	TU-01332	TU-01534
KI-00111 (TU-01083)	TU-00142	TU-00449	TU-01008	TU-01078	TU-01200	TU-01333	TU-01536
KI-00113	TU-00143	TU-00453	TU-01008	TU-01079	TU-01215	TU-01337	TU-01538
KI-00130	TU-00144	TU-00454	TU-01011	TU-01080	TU-01216	TU-01340	TU-01543
KI-00148	TU-00145	TU-00458	TU-01013	TU-01085	TU-01217	TU-01344	TU-01546
KI-00160	TU-00146	TU-00461	TU-01014	TU-01090	TU-01217	TU-01353	TU-01554
KI-00168	TU-00147	TU-00467	TU-01020	TU-01092	TU-01220	TU-01357	TU-01555
KI-00169	TU-00148	TU-00500	TU-01032	TU-01095	TU-01235	TU-01371	TU-01559
KI-00171	TU-00161	TU-00502	TU-01033	TU-01096	TU-01236	TU-01383	TU-01560
KI-00174	TU-00164	TU-00503	TU-01035	TU-01098	TU-01237	TU-01389	TU-01560
KI-00176	TU-00170	TU-00514	TU-01036	TU-01099	TU-01240	TU-01392	TU-01564
KI-00179	TU-00171	TU-00515	TU-01039	TU-01102	TU-01242	TU-01394	TU-01574
KI-00180	TU-00179	TU-00517	TU-01040	TU-01104	TU-01248	TU-01395	TU-01575
KI-00196 (TU-01498)	TU-00180	TU-00519	TU-01041	TU-01105	TU-01249	TU-01409	TU-01576
KI-00198 (TU-01514)	TU-00182	TU-00523	TU-01042	TU-01108	TU-01250	TU-01414	TU-01577
KI-00204	TU-00187	TU-00531	TU-01043	TU-01109	TU-01253	TU-01416	TU-01580
KI-00208	TU-00188	TU-00533	TU-01048	TU-01110	TU-01254	TU-01421	TU-01583
KI-00212	TU-00203	TU-00534	TU-01057	TU-01111	TU-01255	TU-01423	TU-01587
KI-00217	TU-00205	TU-00535	TU-01058	TU-01113	TU-01256	TU-01425	TU-01591
KI-00218	TU-00206	TU-00541	TU-01059	TU-01114	TU-01258	TU-01426	TU-01601
KI-00220	TU-00211	TU-00559	TU-01062	TU-01118	TU-01263	TU-01427	TU-01610
KI-00236	TU-00214	TU-00582	TU-01064	TU-01123	TU-01266	TU-01430	TU-01620
KI-00252	TU-00215	TU-00603	TU-01066	TU-01142	TU-01267	TU-01435	TU-01621
KI-00260 (TU-01695)	TU-00218	TU-00610	TU-01069	TU-01144	TU-01276	TU-01439	TU-01623
KI-00261 (TU-01698)	TU-00219	TU-00620	TU-01069	TU-01149	TU-01277	TU-01446	TU-01633
KI-00295	TU-00220	TU-00624	TU-01069	TU-01156	TU-01288	TU-01454	TU-01634
KI-00315	TU-00221	TU-00625	TU-01069	TU-01158	TU-01292	TU-01455	TU-01635
KI-00333	TU-00223	TU-00627	TU-01069	TU-01163	TU-01298	TU-01456	TU-01644
KI-00352	TU-00224	TU-00628	TU-01069	TU-01166	TU-01299	TU-01457	TU-01645
KI-00357	TU-00225	TU-00752	TU-01069	TU-01167	TU-01302	TU-01467	TU-01646
KI-00358	TU-00228	TU-00955	TU-01069	TU-01168	TU-01304	TU-01470	TU-01647
TU-00013	TU-00243	TU-00960	TU-01069	TU-01171	TU-01309	TU-01476	TU-01649
TU-00042	TU-00244	TU-00961	TU-01069	TU-01176	TU-01310	TU-01479	TU-01655

Reports in PA (cont.):			**Resources in PA:**			
TU-01656	TU-01775	TU-01945	P-16-000017	P-54-002172	P-54-002450	P-54-002493
TU-01657	TU-01776	TU-01945	P-16-000018	P-54-002173	P-54-002451	P-54-002494
TU-01659	TU-01777	TU-01945	P-16-000027	P-54-002174	P-54-002452	P-54-002495
TU-01659	TU-01778	TU-01945	P-16-000071	P-54-002175	P-54-002453	P-54-002496
TU-01659	TU-01783	TU-01953	P-16-000084	P-54-002176	P-54-002454	P-54-002497
TU-01663	TU-01784	TU-01954	P-16-000085	P-54-002177	P-54-002455	P-54-002498
TU-01665	TU-01784	TU-01956	P-16-000086	P-54-002179	P-54-002456	P-54-002499
TU-01668	TU-01789	TU-01961	P-16-000087	P-54-002180	P-54-002457	P-54-002500
TU-01676	TU-01790	TU-01962	P-16-000120 (P-54-004632)	P-54-002181	P-54-002458	P-54-002501
TU-01676	TU-01796	TU-01963	P-16-000122 (P-54-004626)	P-54-002182	P-54-002459	P-54-002502
TU-01676	TU-01806	TU-01966	P-16-000201	P-54-002184	P-54-002460	P-54-002503
TU-01677	TU-01810	TU-01968	P-16-000202	P-54-002185	P-54-002461	P-54-002504
TU-01677	TU-01815	TU-01970	P-16-000206	P-54-002364	P-54-002462	P-54-002505
TU-01677	TU-01820	TU-01977	P-16-000212	P-54-002365	P-54-002463	P-54-002506
TU-01679	TU-01830	TU-01983	P-16-000213	P-54-002366	P-54-002464	P-54-002507
TU-01679	TU-01834	TU-01984	P-16-000250	P-54-002402	P-54-002465	P-54-002508
TU-01680	TU-01837	TU-01988	P-16-000251	P-54-002403	P-54-002466	P-54-002509
TU-01680	TU-01839	TU-01991	P-16-000253	P-54-002424	P-54-002467	P-54-002510
TU-01681	TU-01839		P-16-000258	P-54-002425	P-54-002468	P-54-002511
TU-01683	TU-01841		P-16-000259	P-54-002426	P-54-002469	P-54-002515
TU-01688	TU-01847		P-16-000263	P-54-002427	P-54-002470	P-54-002516
TU-01690	TU-01848		P-16-000270	P-54-002428	P-54-002471	P-54-002517
TU-01692	TU-01849		P-16-000271	P-54-002429	P-54-002472	P-54-002518
TU-01693	TU-01854		P-16-000343	P-54-002430	P-54-002473	P-54-002519
TU-01705	TU-01855		P-16-000352	P-54-002431	P-54-002474	P-54-002520
TU-01709	TU-01863		P-16-000493 (P-54-004619)	P-54-002432	P-54-002475	P-54-002521
TU-01718	TU-01890		P-54-000013	P-54-002433	P-54-002476	P-54-002522
TU-01719	TU-01891		P-54-000014	P-54-002434	P-54-002477	P-54-002523
TU-01721	TU-01897		P-54-000016	P-54-002435	P-54-002478	P-54-002524
TU-01724	TU-01897		P-54-000023	P-54-002436	P-54-002479	P-54-002525
TU-01738	TU-01903		P-54-000042	P-54-002437	P-54-002480	P-54-002526
TU-01739	TU-01904		P-54-000068	P-54-002438	P-54-002481	P-54-002527
TU-01743	TU-01929		P-54-000069	P-54-002439	P-54-002482	P-54-002528
TU-01744	TU-01934		P-54-000070	P-54-002440	P-54-002483	P-54-002529
TU-01745	TU-01935		P-54-000099	P-54-002441	P-54-002484	P-54-002530
TU-01745	TU-01936		P-54-000107	P-54-002442	P-54-002485	P-54-002531
TU-01747	TU-01937		P-54-000127	P-54-002443	P-54-002486	P-54-002532
TU-01760	TU-01938		P-54-000318	P-54-002444	P-54-002487	P-54-002533
TU-01764	TU-01939		P-54-000320	P-54-002445	P-54-002488	P-54-002534
TU-01768	TU-01941		P-54-000321	P-54-002446	P-54-002489	P-54-002535
TU-01770	TU-01943		P-54-000329	P-54-002447	P-54-002490	P-54-002536
TU-01773	TU-01944		P-54-001368	P-54-002448	P-54-002491	P-54-002537
TU-01774	TU-01945		P-54-002160	P-54-002449	P-54-002492	P-54-002538

Resources in PA (cont.):						
P-54-002539	P-54-002583	P-54-002626	P-54-002669	P-54-002712	P-54-002755	P-54-002798
P-54-002540	P-54-002584	P-54-002627	P-54-002670	P-54-002713	P-54-002756	P-54-003229
P-54-002541	P-54-002585	P-54-002628	P-54-002671	P-54-002714	P-54-002757	P-54-003233
P-54-002542	P-54-002586	P-54-002629	P-54-002672	P-54-002715	P-54-002758	P-54-003234
P-54-002543	P-54-002587	P-54-002630	P-54-002673	P-54-002716	P-54-002759	P-54-003235
P-54-002544	P-54-002588	P-54-002631	P-54-002674	P-54-002717	P-54-002760	P-54-003236
P-54-002545	P-54-002589	P-54-002632	P-54-002675	P-54-002718	P-54-002761	P-54-003237
P-54-002546	P-54-002590	P-54-002633	P-54-002676	P-54-002719	P-54-002762	P-54-003238
P-54-002547	P-54-002591	P-54-002634	P-54-002677	P-54-002720	P-54-002763	P-54-003239
P-54-002548	P-54-002592	P-54-002635	P-54-002678	P-54-002721	P-54-002764	P-54-003240
P-54-002549	P-54-002593	P-54-002636	P-54-002679	P-54-002722	P-54-002765	P-54-003241
P-54-002550	P-54-002594	P-54-002637	P-54-002680	P-54-002723	P-54-002766	P-54-003242
P-54-002551	P-54-002595	P-54-002638	P-54-002681	P-54-002724	P-54-002767	P-54-003243
P-54-002552	P-54-002596	P-54-002639	P-54-002682	P-54-002725	P-54-002768	P-54-003244
P-54-002553	P-54-002597	P-54-002640	P-54-002683	P-54-002726	P-54-002769	P-54-003245
P-54-002554	P-54-002598	P-54-002641	P-54-002684	P-54-002727	P-54-002770	P-54-003246
P-54-002555	P-54-002599	P-54-002642	P-54-002685	P-54-002728	P-54-002771	P-54-003247
P-54-002556	P-54-002600	P-54-002643	P-54-002686	P-54-002729	P-54-002772	P-54-003248
P-54-002557	P-54-002601	P-54-002644	P-54-002687	P-54-002730	P-54-002773	P-54-003249
P-54-002558	P-54-002602	P-54-002645	P-54-002688	P-54-002731	P-54-002774	P-54-003250
P-54-002560	P-54-002603	P-54-002646	P-54-002689	P-54-002732	P-54-002775	P-54-003251
P-54-002561	P-54-002604	P-54-002647	P-54-002690	P-54-002733	P-54-002776	P-54-003252
P-54-002562	P-54-002605	P-54-002648	P-54-002691	P-54-002734	P-54-002777	P-54-003253
P-54-002563	P-54-002606	P-54-002649	P-54-002692	P-54-002735	P-54-002778	P-54-003254
P-54-002564	P-54-002607	P-54-002650	P-54-002693	P-54-002736	P-54-002779	P-54-003255
P-54-002565	P-54-002608	P-54-002651	P-54-002694	P-54-002737	P-54-002780	P-54-003256
P-54-002566	P-54-002609	P-54-002652	P-54-002695	P-54-002738	P-54-002781	P-54-003257
P-54-002567	P-54-002610	P-54-002653	P-54-002696	P-54-002739	P-54-002782	P-54-003258
P-54-002568	P-54-002611	P-54-002654	P-54-002697	P-54-002740	P-54-002783	P-54-003259
P-54-002569	P-54-002612	P-54-002655	P-54-002698	P-54-002741	P-54-002784	P-54-003260
P-54-002570	P-54-002613	P-54-002656	P-54-002699	P-54-002742	P-54-002785	P-54-003261
P-54-002571	P-54-002614	P-54-002657	P-54-002700	P-54-002743	P-54-002786	P-54-003262
P-54-002572	P-54-002615	P-54-002658	P-54-002701	P-54-002744	P-54-002787	P-54-003263
P-54-002573	P-54-002616	P-54-002659	P-54-002702	P-54-002745	P-54-002788	P-54-003264
P-54-002574	P-54-002617	P-54-002660	P-54-002703	P-54-002746	P-54-002789	P-54-003265
P-54-002575	P-54-002618	P-54-002661	P-54-002704	P-54-002747	P-54-002790	P-54-003266
P-54-002576	P-54-002619	P-54-002662	P-54-002705	P-54-002748	P-54-002791	P-54-003267
P-54-002577	P-54-002620	P-54-002663	P-54-002706	P-54-002749	P-54-002792	P-54-003268
P-54-002578	P-54-002621	P-54-002664	P-54-002707	P-54-002750	P-54-002793	P-54-003269
P-54-002579	P-54-002622	P-54-002665	P-54-002708	P-54-002751	P-54-002794	P-54-003270
P-54-002580	P-54-002623	P-54-002666	P-54-002709	P-54-002752	P-54-002795	P-54-003272
P-54-002581	P-54-002624	P-54-002667	P-54-002710	P-54-002753	P-54-002796	P-54-003273
P-54-002582	P-54-002625	P-54-002668	P-54-002711	P-54-002754	P-54-002797	P-54-003274

Resources in PA (cont.):						
P-54-003275	P-54-003651	P-54-003697	P-54-003740	P-54-004041	P-54-005054	P-54-005286
P-54-003276	P-54-003652	P-54-003698	P-54-003741	P-54-004042	P-54-005056	P-54-005287
P-54-003277	P-54-003653	P-54-003699	P-54-003742	P-54-004043	P-54-005057	P-54-005289
P-54-003278	P-54-003654	P-54-003700	P-54-003743	P-54-004044	P-54-005058	P-54-005290
P-54-003279	P-54-003656	P-54-003701	P-54-003744	P-54-004045	P-54-005059	P-54-005291
P-54-003280	P-54-003657	P-54-003702	P-54-003745	P-54-004046	P-54-005060	P-54-005292
P-54-003281	P-54-003658	P-54-003703	P-54-003746	P-54-004047	P-54-005061	P-54-005293
P-54-003282	P-54-003659	P-54-003704	P-54-003747	P-54-004048	P-54-005062	P-54-005296
P-54-003283	P-54-003660	P-54-003705	P-54-003748	P-54-004049	P-54-005063	P-54-005297
P-54-003284	P-54-003661	P-54-003706	P-54-003749	P-54-004327	P-54-005064	P-54-005298
P-54-003285	P-54-003662	P-54-003707	P-54-003750	P-54-004329	P-54-005065	P-54-005306
P-54-003286	P-54-003664	P-54-003708	P-54-003751	P-54-004582	P-54-005066	P-54-005307
P-54-003287	P-54-003665	P-54-003709	P-54-003752	P-54-004583	P-54-005067	P-54-005308
P-54-003288	P-54-003666	P-54-003710	P-54-003753	P-54-004584	P-54-005068	P-54-005309
P-54-003289	P-54-003667	P-54-003711	P-54-003754	P-54-004585	P-54-005069	P-54-005310
P-54-003290	P-54-003668	P-54-003712	P-54-003755	P-54-004614	P-54-005070	P-54-005358
P-54-003291	P-54-003670	P-54-003713	P-54-003756	P-54-004620	P-54-005071	P-54-005393
P-54-003292	P-54-003671	P-54-003714	P-54-003757	P-54-004621	P-54-005072	P-54-005495
P-54-003293	P-54-003672	P-54-003715	P-54-003758	P-54-004622	P-54-005073	P-54-005496
P-54-003294	P-54-003673	P-54-003716	P-54-003759	P-54-004623	P-54-005074	P-54-005512
P-54-003295	P-54-003674	P-54-003717	P-54-003760	P-54-004744	P-54-005075	P-54-005576
P-54-003296	P-54-003675	P-54-003718	P-54-003761	P-54-004745	P-54-005076	P-54-005577
P-54-003297	P-54-003676	P-54-003719	P-54-003762	P-54-004794	P-54-005077	P-54-005578
P-54-003298	P-54-003677	P-54-003720	P-54-003763	P-54-004795	P-54-005078	P-54-005579
P-54-003299	P-54-003678	P-54-003721	P-54-003891	P-54-004796	P-54-005079	P-54-005580
P-54-003300	P-54-003679	P-54-003722	P-54-003892	P-54-004832	P-54-005080	P-54-005581
P-54-003301	P-54-003680	P-54-003723	P-54-003893	P-54-004873	P-54-005081	P-54-005582
P-54-003302	P-54-003681	P-54-003724	P-54-003894	P-54-004874	P-54-005082	P-54-005583
P-54-003303	P-54-003682	P-54-003725	P-54-004006	P-54-004875	P-54-005083	P-54-005584
P-54-003304	P-54-003683	P-54-003726	P-54-004020	P-54-004877	P-54-005084	P-54-005585
P-54-003305	P-54-003684	P-54-003727	P-54-004024	P-54-004878	P-54-005085	P-54-005586
P-54-003306	P-54-003685	P-54-003728	P-54-004025	P-54-004879	P-54-005095	P-54-005587
P-54-003312	P-54-003686	P-54-003729	P-54-004026	P-54-004880	P-54-005210	P-54-005588
P-54-003381	P-54-003687	P-54-003730	P-54-004027	P-54-004881	P-54-005211	P-54-005589
P-54-003564	P-54-003688	P-54-003731	P-54-004028	P-54-004882	P-54-005220	P-54-005590
P-54-003596	P-54-003689	P-54-003732	P-54-004029	P-54-004883	P-54-005221	P-54-005591
P-54-003597	P-54-003690	P-54-003733	P-54-004030	P-54-004885	P-54-005240	P-54-005592
P-54-003600	P-54-003691	P-54-003734	P-54-004035	P-54-004886	P-54-005241	P-54-005593
P-54-003601	P-54-003692	P-54-003735	P-54-004036	P-54-004894	P-54-005249	P-54-005594
P-54-003602	P-54-003693	P-54-003736	P-54-004037	P-54-004993	P-54-005251	P-54-005595
P-54-003607	P-54-003694	P-54-003737	P-54-004038	P-54-004994	P-54-005252	P-54-005596
P-54-003619	P-54-003695	P-54-003738	P-54-004039	P-54-005052	P-54-005279	P-54-005597
P-54-003650	P-54-003696	P-54-003739	P-54-004040	P-54-005053	P-54-005285	P-54-005611

Resources in PA (cont.):	Informal Resources in PA:
P-54-005612	Ax Bridge Canal
P-54-005613	Bones
P-54-005614	Bridge 45-05
P-54-005654	Bridge 45-06
P-54-005667	Bridge 46-0114
P-54-005713	Bridge 46-100
P-54-005714	Bridge 46-115
	Bridge 46-141
	Bridge 46-19
	Bridge 46-24
	Bridge 46-67
	CHL-410
	CHL-471
	CHL-934
	House pit/Beads
	Site ID 3286-1
	Skull
	Skull and Bones
	TUL-PRO-007
	Village Site
	Village Site

Name	Aliases and Alias Types	St Number	St Name	City	Evaluation Code
TULARE CITY HALL		411	E KERN AVE	TULARE	3S
TULARE UNION HIGH SCHOOL		755	E TULARE AVE	TULARE	1D
TULARE UNION HIGH SCHOOL		755	E TULARE AVE	TULARE	1D
Tulare Union High School Auditorium and Administra	Tulare Joint Union High School Auditorium | Tulare Union High School Auditorium and Administration Building	755	E TULARE AVE	TULARE	1S
ADOHR CREAMERY STATUE		600	N J ST	TULARE	3S
AOHRS CREAMERY		605	N J ST	TULARE	3S
TULARE WATER TOWER, MADDEN WATER WORKS SITE			O ST	TULARE	2S2
DU FAY HOUSE		226	S BLACKSTONE ST	TULARE	3S
LINDERS HARDWARE		140	S K ST	TULARE	3B
NATIONAL BANK OF TULARE		157	S K ST	TULARE	3B
TULARE CHAMBER OF COMMERCE		600	S K ST	TULARE	3S
TULARE COUNTY GENERAL HOSPITAL		1062	S K ST	TULARE	3D
PHYSICIANS RESIDENCE		1062	S K ST	TULARE	3D
MAINTENANCE SHOP		1062	S K ST	TULARE	3D
ANNEX BUILDING		1062	S K ST	TULARE	3D
TULARE COUNTY GENERAL HOSPITAL		1062	S K ST	TULARE	3S
PERCY AND MAXINE WHITESIDE HOUSE		110	SALIDA ST	TULARE	3B
LINDERS MANSION		815	SYCAMORE AVE	TULARE	3B
SEQUOIA FIELD GROUND ACCESS ROAD			AVE 368	VISALIA	1D
SEQUOIA FIELD PARADE GROUND			AVE 368	VISALIA	1D
SEQUOIA FIELD FLAG POLE			AVE 368	VISALIA	1D
SEQUOIA FIELD ADULT CORRECTION CENTER BLDG F			AVE 368	VISALIA	1D
SEQUOIA FIELD CADET BARRACKS	ADULT CORRECTION CENTER BLDG C		AVE 368	VISALIA	1D
SEQUOIA FIELD CADET BARRACKS	ADULT CORRECTION CENTER BLDG L		AVE 368	VISALIA	1D
SEQUOIA FIELD CADET BARRACKS	ADULT CORRECTION CENTER BLDG 2		AVE 368	VISALIA	1D
SEQUOIA FIELD CADET BARRACKS	ADULT CORRECTION CENTER BLDG S		AVE 368	VISALIA	1D
SEQUOIA FIELD CADET BARRACKS	ADULT CORRECTION CENTER BLDG G		AVE 368	VISALIA	1D
SEQUOIA FIELD CADET BARRACKS	TULARE CO. SHERIFF'S DEPARTMENT		AVE 368	VISALIA	1D
SEQUOIA FIELD CADET BARRACKS	TULARE COUNTY SHERIFFS DEPT		AVE 368	VISALIA	1D
SEQUOIA FIELD CADET BARRACKS	TULARE CO SHERIFFS DEPT STORAGE		AVE 368	VISALIA	1D
SEQUOIA FIELD BASE HOSPITAL	TCSD DETECTIVE OFFICES		AVE 368	VISALIA	1D
SEQUOIA FIELD CADET GROUND SCHOOL BLDG	TCSD DETECTIVE OFFICE		AVE 368	VISALIA	1D
SEQUOIA FIELD CADET GROUND SCHOOL	STORAGE		AVE 368	VISALIA	1D
SEQUOIA FIELD REC, CANTEEN, MESS HALL, KITCHEN	BLDG M		AVE 368	VISALIA	1D
SEQUOIA FIELD CHANGE ROOM	ADULT CORRECTION CENTER TOOL ROOM		AVE 368	VISALIA	1D
SEQUOIA FIELD HANGARS AND PARKING APRON ACCESS ROA	SEQUOIA FIELD HANGARS AND PARKING APRON ACCESS ROAD		AVE 368	VISALIA	1D
SEQUOIA FIELD SOUTH HANGAR			AVE 368	VISALIA	1D
SEQUOIA FIELD CONTROL TOWER			AVE 368	VISALIA	1D
SEQUOIA FIELD FLIGHT OFFICE	TBM INC ADMINISTRATIVE OFFICES		AVE 368	VISALIA	1D
SEQUOIA FIELD NORTH HANGAR			AVE 368	VISALIA	1D
SEQUOIA FIELD RUNWAY AND PARKING APRON			AVE 368	VISALIA	1D
Sequoia Field-Visalia-Dinuba School of Aeronautic	Sequoia Field-Visalia-Dinuba School of Aeronautics		AVE 368	VISALIA	1S
Bank of Italy Building | Bank of America Building	Bank of America Building^Other Name | Bank of Italy Building	128	E MAIN ST	VISALIA	1S
TULARE COUNTY JAIL, OLD JAIL		204	E OAK ST	VISALIA	2D3
SANTE FE DEPOT, DEPOT RESTAURANT		207	E OAK ST	VISALIA	3S
ELECTRO-PLATING BUILDING		410	E RACE ST	VISALIA	3S
		319	N CHURCH ST	VISALIA	3S
TULARE COUNTY COURTHOUSE, TULARE COUNTY WELFARE DE	TULARE COUNTY COURTHOUSE, TULARE COUNTY WELFARE DEPARTMENT	210	N COURT ST	VISALIA	2S2
METHODIST EPISCOPAL CHURCH SOUTH		320	N COURT ST	VISALIA	2S2
BRADLEY HOME		420	N COURT ST	VISALIA	3S
E O MILLER HOUSE		525	N COURT ST	VISALIA	3S
THE HANNAH HOUSE		513	N ENCINA ST	VISALIA	3S
BEN MADDOX HOUSE		601	N ENCINA ST	VISALIA	3S
STEVENS HOME		617	N ENCINA ST	VISALIA	3S
SPALDING HOUSE		631	N ENCINA ST	VISALIA	3S
		719	N HIGHLAND AVE	VISALIA	3S
		509	N LOCUST ST	VISALIA	3S
		515	N LOCUST ST	VISALIA	3S
		519	N LOCUST ST	VISALIA	3S
		523	N LOCUST ST	VISALIA	3S
		533	N LOCUST ST	VISALIA	3S
		539	N LOCUST ST	VISALIA	3S
		705	N LOCUST ST	VISALIA	3S

Name	Aliases and Alias Types	St Number	St Name	City	Evaluation Code
		711	N LOCUST ST	VISALIA	3S
		1015	N STEVENSON ST	VISALIA	3S
BAKER APARTMENTS		700	N WILLIS ST	VISALIA	3S
		715	N WILLIS ST	VISALIA	3S
LOCEY HOUSE		719	N WILLIS ST	VISALIA	3S
		725	N WILLIS ST	VISALIA	3S
		731	N WILLIS ST	VISALIA	3S
MORLEY MADDOX HOME		737	N WILLIS ST	VISALIA	3S
SOUTHERN PACIFIC DEPOT		325	OAK ST	VISALIA	3S
BRIDGE #46C-410	MOONEY PARK BRIDGE		RD 118	VISALIA	2S2
GARCIA HOME		449	S CHURCH ST	VISALIA	3S
Hyde House		500	S Court St	Visalia	1S
		705	S COURT ST	VISALIA	3S
THE MOONEY HOUSE		807	S COURT ST	VISALIA	3S
MEARLE'S DRIVE-IN		604	S MOONEY BLVD	VISALIA	2S2
COLLEGE OF THE SEQUOIAS		915	S MOONEY BLVD	VISALIA	2S2
THE PIONEER		27000	S MOONEY BLVD	VISALIA	1S
US Post Office-Visalia Town Center Station		11	W ACEQUIA ST	VISALIA	1S
SPALDING CARRIAGE HOUSE		208	W GROVE ST	VISALIA	3S
		218	W GROVE ST	VISALIA	3S
FOX THEATER		300	W MAIN ST	VISALIA	3S
VISALIA CITY LIBRARY		200	W OAK ST	VISALIA	2S2
PERSIAN DITCH-SEGMENT 3				VISALIA	2S2

Evaluation Codes:

1D: Contributor to a multi-component resource like a district listed in the National Register of Historic Places by the Keeper. Listed in the California Register of Historical Resources.

1S: Individually listed in the National Register of Historic Places by the Keeper. Listed in the California Register of Historical Resources.

2D3: Contributor to a multi-component resource determined eligible for listing in the National Register of Historic Places by Part 1 Tax Certification. Listed in the California Register of Historical Resources.

2S2: Individually determined eligible for listing in the National Register of Historic Places by a consensus through the Section 106 process. Listed in the California Register of Historical Resources.

3B: Appears eligible for listing in the National Register of Historic Places both individually and as a contributor to a National Register of Historic Places eligible multi-component resource like a district through survey evaluation.

3D: Appears eligible for listing in the National Register of Historic Places as a contributor to a National Register of Historic Places eligible multi-component resource through survey evaluation.

3S: Appears eligible for listing in the National Register of Historic Please individually through survey evaluation.

NAHC – Sacred Lands File Search Results

NATIVE AMERICAN HERITAGE COMMISSION

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov

January 22, 2025

Jackie Lancaster
Provost & Pritchard Consulting Group

Via Email to: jlancaster@ppeng.com

Re: River and Stream Maintenance Project, Kings and Tulare Counties

To Whom It May Concern:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information submitted for the above referenced project. The results were positive. Please contact the tribes on the attached list for information. Please note that tribes do not always record their sacred sites in the SLF, nor are they required to do so. A SLF search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with a project's geographic area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites, such as the appropriate regional California Historical Research Information System (CHRIS) archaeological Information Center for the presence of recorded archaeological sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. Please contact all of those listed; if they cannot supply information, they may recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify the NAHC. With your assistance, we can assure that our lists contain current information.

If you have any questions, please contact me at my email address: melina.carlos@nahc.ca.gov

Sincerely,

Melina Carlos

Melina Carlos
Cultural Resources Analyst

Attachment