FRESNO IRRIGATION DISTRICT
RECHARGE BASIN PHASE II PROJECT
DRAFT INITIAL STUDY/MITIGATED NEGATIVE DECLARATION

APRIL 2024

SCH NO.

PREPARED FOR:
Fresno Irrigation District
2907 South Maple Avenue
Fresno, CA 93725-2218

PREPARED BY:
Provost & Pritchard Consulting Group

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CONSULTING GROUP

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ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
AE	Exclusive Agriculture
AF	Acre Feet
APE	Area of Potential Effect
APN	Assessor's Parcel Number
BMP	Best Management Practices
BPS	Best Performance Standards
BUOW	Burrowing Owl
CalEEMod	California Emissions Estimator Modeling (software)
CAA	Clean Air Act (federal)
CARB	California Air Resources Board
CCAA	California Clean Air Act
CCR	California Code of Regulations
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
CO_2 E	Carbon dioxide Equivalent
County	Fresno County
CZMA	Coastal Zone Management Act
District	Fresno Irrigation District
DOC	Department of Conservation
DTSC	Department of Toxic Substances Control
EIR	Environmental Impact Report
EO	Executive Order
FCFPD	Fresno County Fire Protection District
FEMA	Federal Emergency Management Agency

FID .... Fresno Irrigation District
FMMP .... Farmland Mapping and Monitoring Program
FPPA .... Farmland Protection and Policy Act
GHG .... Greenhouse Gas
GSP .... Groundwater Sustainability Plan
GWP .... Global Warming Potential
HCP .... Habitat Conservation Plan
IPaC .... U.S. Fish and Wildlife Service's Information for Planning and Consultation system
IS .... Initial Study
IS/MND .... Initial Study/Mitigated Negative Declaration
MMRP .... Mitigation Monitoring and Reporting Program
MND .... Mitigated Negative Declaration
MSL .... Mean Sea Level
MT .... Metric Tons
NAHC .... Native American Heritage Commission
NCCP .... Natural Communities Conservation Plans
NCFPD .... North Central Fire Protection District
ND .... Negative Declaration
NKGSA .... North Kings Groundwater Sustainability Agency
NO_2 .... Nitrogen Dioxide
NOx .... Nitrogen Oxides
O_3 .... Ozone
Pb .... Lead
PG&E .... Pacific Gas and Electric
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
PRC .... Public Resources Code
Project .... Recharge Basin Phase II Project
ROG .... Reactive Organic Gases
SDWA .... Safe Drinking Water Act
SGMA .... Sustainable Groundwater Management Act

SIP	State Implementation Plan
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SO_2	Sulfur Dioxide
SR	State Route
SSA	Sole Source Aquifer
SSJVIC	South San Joaquin Valley Information Center
SRA	State Responsibility Area
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TPY	tons per year
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UST	Underground Storage Tank
µg/m3	micrograms per cubic meter
WEAP	Worker Environmental Awareness Program

CHAPTER 1 INTRODUCTION

Provost & Pritchard Consulting Group (Provost & Pritchard) has prepared this Initial Study/Mitigated Negative Declaration (IS/MND) on behalf of Fresno Irrigation District (FID or District) to address the potential environmental effects of the Recharge Basin Phase II Project (Project). This document has been prepared in accordance with the California Environmental Quality Act (CEQA), Public Resources Code (PRC) Section 21000 et seq. The District is the CEQA lead agency for this Project.

The sites 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 (CCR) 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 negative declaration* (MND) 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 California Emissions Estimator Modeling software or CalEEMod Output Files, Biological Evaluation, and Cultural Class III Inventory/ Phase I Survey Report, are provided as technical Appendix A, Appendix B, and Appendix C, respectively, at the end of this document.

CHAPTER 2 PROJECT DESCRIPTION

2.1 PROJECT BACKGROUND

2.1.1 Project Title

Recharge Basin Phase II Project

2.1.2 Lead Agency Name and Address

Fresno Irrigation District
2907 South Maple Avenue
Fresno, CA 93725-2218

2.1.3 Contact Person and Phone Number

Lead Agency Contact

Laurence Kimura
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CEQA Consultant

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2.1.4 Project Location

The Project would be located within the Central San Joaquin Valley of California, in the western unincorporated jurisdiction of Fresno County. The centroid for all three basin sites is 36°43’03.87” N, 119°46’08.29” W. The Project consists of three separate recharge basin facilities totaling 154 acres at the following locations:

Table 2-1: Basin Location Information

Basin	Acres	Location	Assessor’s Parcel Number (APN)	Township/Range/Section T/R/S
Krum Basin	54 acres	Near the intersection of N. Hayes Avenue and W. McKenzie Avenue	326-040-23S	T14S/R19E/03
Laub Basin	80 acres	Near the intersection of S. Marks Avenue and W. American Avenue	035-300-41S	T15S/R19E/01
Crossland Basin	20 acres	Near the intersection of De Wolf Avenue and East Butler Avenue	313-410-025 and -026	T14s/R21E/12

2.1.5 General Plan Designation and Zoning – Onsite and Surrounding Land Uses

All three basin sites as well as the immediate surrounding areas have a General Plan Designation of Agricultural and are all zoned AE (Exclusive Agriculture).

2.1.6 Surrounding Land Uses and Setting

The general vicinity of the Project sites consist of farmland and scattered residential and vacant land uses typical to rural areas in the Central Valley. Properties directly surrounding the Project sites are currently in use for agriculture, including vines and tree crops. The District is located on the Valley floor east of the Coast Ranges and west of the Sierra Nevada Mountain Range. The topography of each basin site is relatively flat. The elevation for the Krum Basin site ranges between 258-262 feet above mean sea level (MSL). The elevation for the Laub Basin site ranges between 256-259 feet above MSL. The Crossland Basin site ranges between 337-340 feet above MSL (Figure 2-2).

All three sites contain or are adjacent to existing District canal facilities that the proposed basins would tie into as a part of this Project.

2.1.7 Description of Project

District Background[1]

The District was formed in 1920 under the California Irrigation Districts Act, as the successor to the privately owned Fresno Canal and Land Company. The assets of the company consisted of over 800 miles of canals and distribution works which were constructed between 1850 and 1880 and the extensive water rights on Kings River. The District which now comprises some 245,000 acres, lies entirely within Fresno County and includes the rapidly growing Fresno-Clovis metropolitan area.

A significant improvement in the control and management of the waters of Kings River occurred with the completion of the Pine Flat Dam project by the United States Army Corps of Engineers (USACE) in 1954. Although built primarily as a flood control project, the Dam provides significant water conservation benefits stemming from the storage and regulation of irrigation water by the 28 water right entities on Kings River including FID. The District contracted for 11.82% of the 1,000,000-acre feet (AF) capacity of the Pine Flat Reservoir. While the District is entitled to approximately 26% of the average runoff of Kings River, much of its entitlement occurs at times when it can be used directly for irrigation of crops without the need for regulation at Pine Flat.

In a normal year, the District diverts approximately 500,000 AF of water and delivers most of it to agricultural users, although an ever-increasing share of the District's water supply is used for groundwater recharge in the urban area.

In addition to its entitlement from the Kings River, the District has a contract from the Friant Division of the Central Valley Project for 75,000 AF of Class II Irrigation water.

Historically, excess water applied by the farmers has percolated beyond the root zone and recharged the extensive aquifer underlying the Fresno Irrigation District. Between 85% and 90% of the groundwater supply can be attributed to water imported and distributed by the District.

[1] (Fresno Irrigation District 2023)

In recent years, the District has formed cooperative agreements with other agencies to handle special projects and to solve specific problems. Three examples are:

1. An agreement with the City of Fresno to recycle groundwater from the vicinity of the Regional Sewage Treatment Facility operated by the City.
2. A storm water agreement with the City of Clovis, the City of Fresno, Fresno County and the Metropolitan Flood Control District for the coordinated use of District's facilities to handle foothill and urban storm water runoff.
3. Cooperative agreements with the City of Clovis and the City of Fresno for a proportionate share of the District's water entitlement in exchange for lump sum payment of water service charges, rather than the District billing the tens of thousands of individual landowners within those urban areas.

As a public corporation, the District is governed by a board of five directors. Each director represents a separate geographical division of the District and is elected for a term of four years by the qualified voters within his division. Regular board meetings are held twice each month.

The budget of the District is adopted by the Board in August for the following calendar year. There are no volumetric charges for the delivery of water to the landowners, but the property is assessed by service provided on a per acre basis. The District usually delivers over two AF per acre of water in a normal year, but it may be lower or higher in extremely dry or wet years.

Day to day operations are the responsibility of the general manager acting through the following described five divisions:

1. Administration & Operations headed by the Assistant General Managers;
2. Engineering headed by the Chief Engineer;
3. Accounting headed by the Controller;
4. Water headed by the Watermaster;
5. Construction & Maintenance headed by the Superintendent of Const. & Maintenance

The District is a member of the North Kings Groundwater Sustainability Agency (NKGSA) that has adopted a Groundwater Sustainability Plan (GSP) to meet the requirements of the Sustainable Groundwater Management Act (SGMA). To help reach sustainability, the District has included several recharge basin projects within the NKGSA's GSP, including the projects described herein.

Project Description

The District is proposing to construct three recharge basins in Fresno County within the boundary of the District. The Project would assist the District in expanding its groundwater recharge efforts. The three basins proposed would range in size from 20 to 80 acres (154 acres in total). The Project Area of Potential Affect (APE) for biological and cultural surveys is identified as 154 acres.

The proposed benefits of all three basins includes recharge, new storage of floodwater, providing new habitat for waterfowl and to assist the District to maintain its commitments to the Kings River fisheries management program by providing place for fish management water to be diverted in dry years. These basins are all in a critical location for the District to perform recharge and would capture and use storm and flood water supplies available to the District.

The following components would be consistent at each basin site:

- Basin depth would be up to 20 feet below ground surface.
- Up to two monitoring wells,

- Metering stand and flow meter,
- Perimeter fencing- cattle fence,
- Excavation would be balanced onsite or exported offsite, as needed,
- Up to two recovery wells and discharge pipeline to deliver ~5 cubic feet per second to adjacent existing FID infrastructure (canal or pipeline).
- Maximum berm height of 6 feet measured from the lowest point at the downstream toe of the berm to its maximum storage elevation, which is typically the spillway crest.

Specific details that are unique to each recharge basin are outlined below.

Krum Recharge Basin:

The Project includes construction of a new 54-acre recharge basin, including earthwork and structures located near the intersection of N. Hayes Avenue and W. McKenzie Avenue, identified as APN 326-040-23S in Fresno County (see Figure 2-4). The property is currently vacant and clear of vegetation. The District owns the conveyance canal, Houghton No. 78, crossing the Project site. The Project would provide approximately 220 AF of flood water surface storage and recharge approximately 1,320 AF/year annual average. The Project includes the following construction components that would connect to Houghton No. 78 Canal which exists to the south.

- Basin outlet structure.
- Two existing well sites that would be properly abandoned or used for monitoring wells.
- The concrete structure below ground surface would be removed.
- Access is off Hayes Avenue.

Laub Recharge Basin

The Project includes construction of a new 80-acre recharge basin including earthwork and structures located near the intersection of S. Marks Avenue and W. American Avenue, identified as APN 035-300-41S in Fresno County (see Figure 2-5). The land has been previously cleared of vines and the APE would extend along the east side of the Central No. 23 District-owned canal. The Project would provide approximately 300 AF of flood water surface storage and recharge approximately 1,800 AF/year annual average. The Project includes the following construction components that would connect to Central Canal No. 23 which is existing to the west.

- Basin outlet structure.
- Access would be off Marks Avenue.

Crossland Recharge Basin

The Project includes construction of a new 20-acre recharge basin including earthwork and structures, located near the intersection of De Wolf Avenue and East Butler Avenue, identified as APNs 313-410-025 and -026, in Fresno County (see Figure 2-6). The Project site has been cleared and is vacant. The APE is located south of the Hansen No. 29 Canal. The Project would provide approximately 80 AF of flood water surface storage and recharge approximately 480 AF/year annual average. The Project includes the following construction components that would connect to Hansen No. 29 Canal which exists to the north.

- Basin outlet structure.
- Access would be off DeWolf Avenue and the Hansen Canal.

Construction

Construction of each of the basin sites is anticipated to be completed over approximately six months. The Project parcels have been and/or would be cleared of vegetation, fencing, structures, and other debris. The Project includes mobilization, site preparation, berm construction surrounding the basins; earthwork and structures placement; Project turnout(s), metering stands, diversion check structures, intrabasin and basin outfall structures. New berm construction would not exceed six feet, measured from the exterior toe to the top of new levee. For the canal connections to the proposed basins, FID would cut a notch (less than 50-ft wide) in the existing canal wall, insert a pipeline, and put up one outlet structure, pre-cast concrete ideally or cast in place into canal. The Project may include ponds/cells within the basins separated by berms. After construction completion, performance testing and demobilization would occur.

Equipment

Construction equipment would likely include the following equipment used during construction:

- Excavators,
- Backhoes,
- Graders,
- Skid steers,
- Loaders,
- Hauling trucks,
- Scrapers,
- Sheep's foot compactors (Large and Small dependent on area conditions),
- D9 dozer,
- large tractor and large discing unit,
- Water trucks supplying water for dust control and conditioning soil for compaction, and
- Large watercannon and hoses.

Post-construction activities would include system testing, commissioning, and site clean-up. Construction would require temporary staging and storage of materials and equipment. Staging areas would be located onsite.

Operation and Maintenance

Each of the proposed basin sites include construction of a recovery well and monitoring wells to assist the District with monitoring and managing the groundwater recharge basins and levels. The District's operation of the basins would be consistent with the District's other similar facilities in that groundwater conditions would be monitored to minimize negative impacts on the surrounding areas (such as nearby wells, crops, and septic systems).

2.1.8 Other Public Agencies Whose Approval May Be Required

Ministerial approvals and permits that may be required:

- State Water Resources Control Board – National Pollutant Discharge Elimination System Construction General Permit
- San Joaquin Valley Air Pollution Control District – Rules and Regulations (Regulation VIII, Rule 9510, Rule 4641)

2.1.9 Consultation with California Native American Tribes

Public Resources Code (PRC) 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, as the CEQA lead agency, has received written correspondence from two tribes, Dumna Wo Wah Tribal Government and Santa Rosa Rancheria Tachi Yokut Tribe, pursuant to PRC Section 21080.3.1 requesting notification of proposed project.

The District sent a certified letter via United States Postal Service on October 10, 2023, to both tribes describing the Project and provided maps of the basin site locations. The District's contact information and notification that the Tribe had 30 days to request consultation pursuant to AB 52 were included. The 30-day timeline ran its course and no responses or requests for consultation were received by the District. All Tribal correspondence is included within Appendix C.

2.1.10 "CEQA–Plus" Assessment

The District may be applying for financial assistance to implement the Project through State or federal funding in the future.

In addition to meeting the requirements of CEQA, and because financial assistance could come from the Federal government (United States Environmental Protection Agency (USEPA), for instance), the Project could be subject to "federal cross-cutting authority" requirements of other federal laws and Executive Orders that apply in federal financial assistance programs. (This process is frequently referred to as "CEQA-Plus.") Therefore, the District may also complete certain studies and analyses to satisfy various federal environmental requirements.

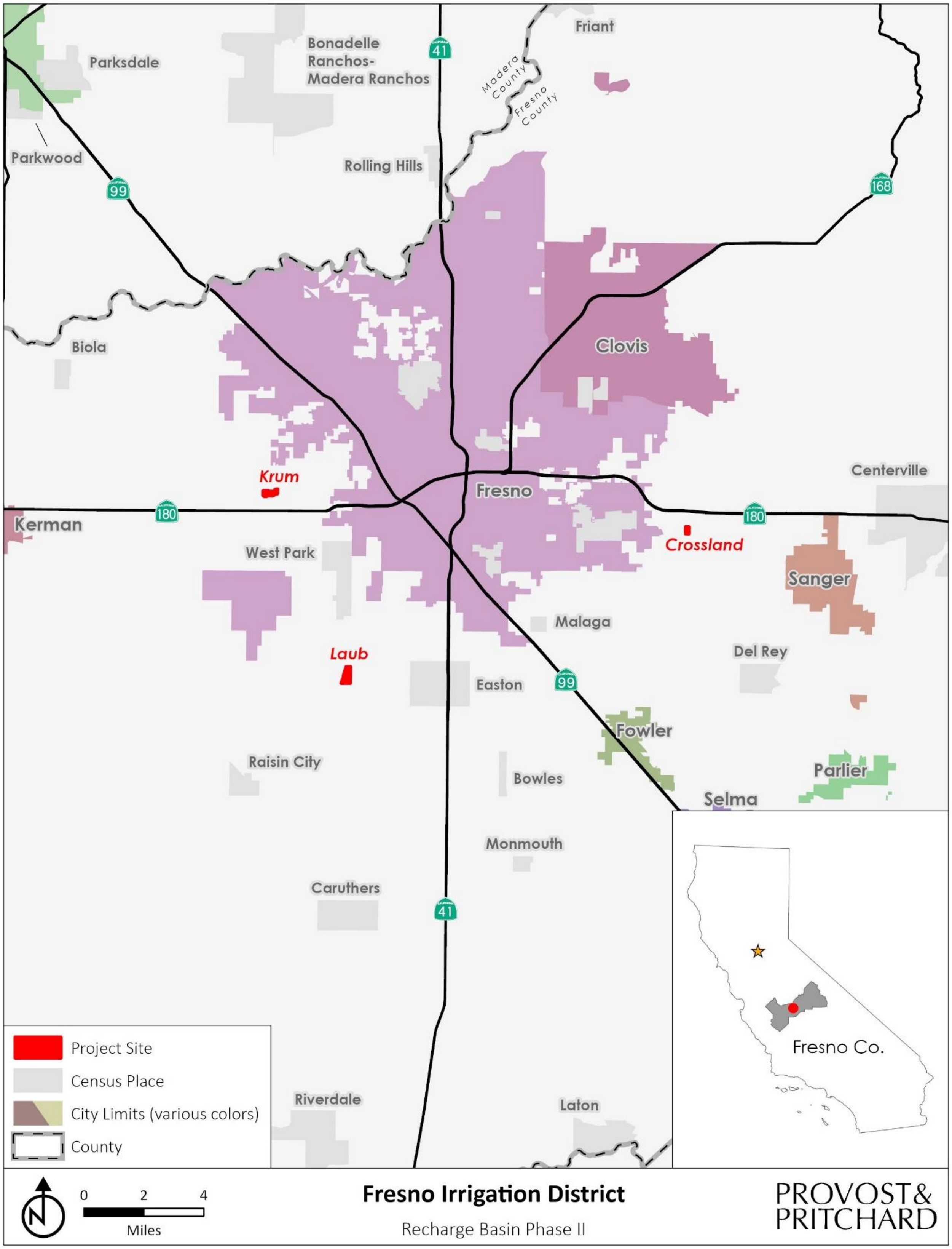

Figure 2-1: Regional Vicinity Map

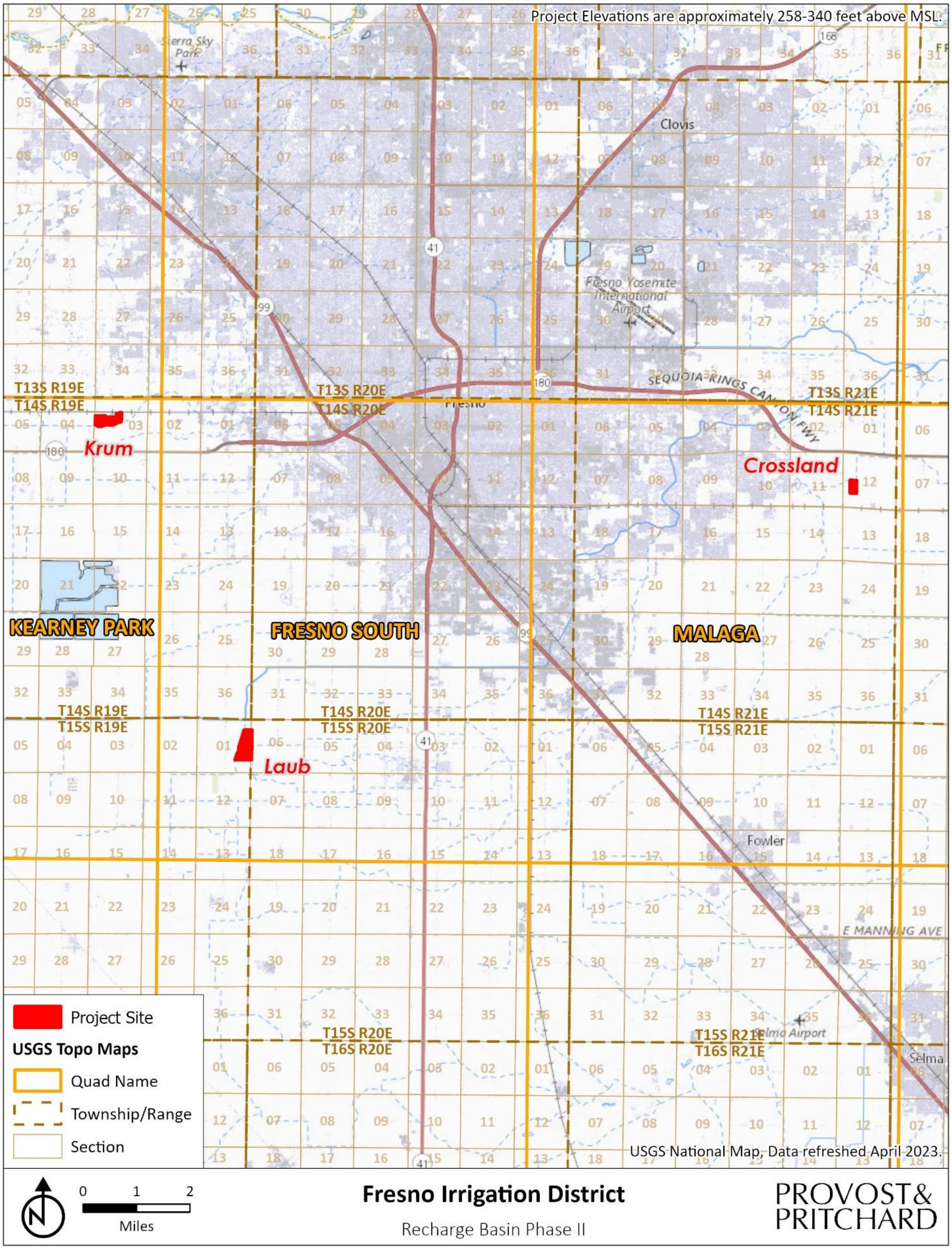

Figure 2-2: Topographical Quadrangle Map

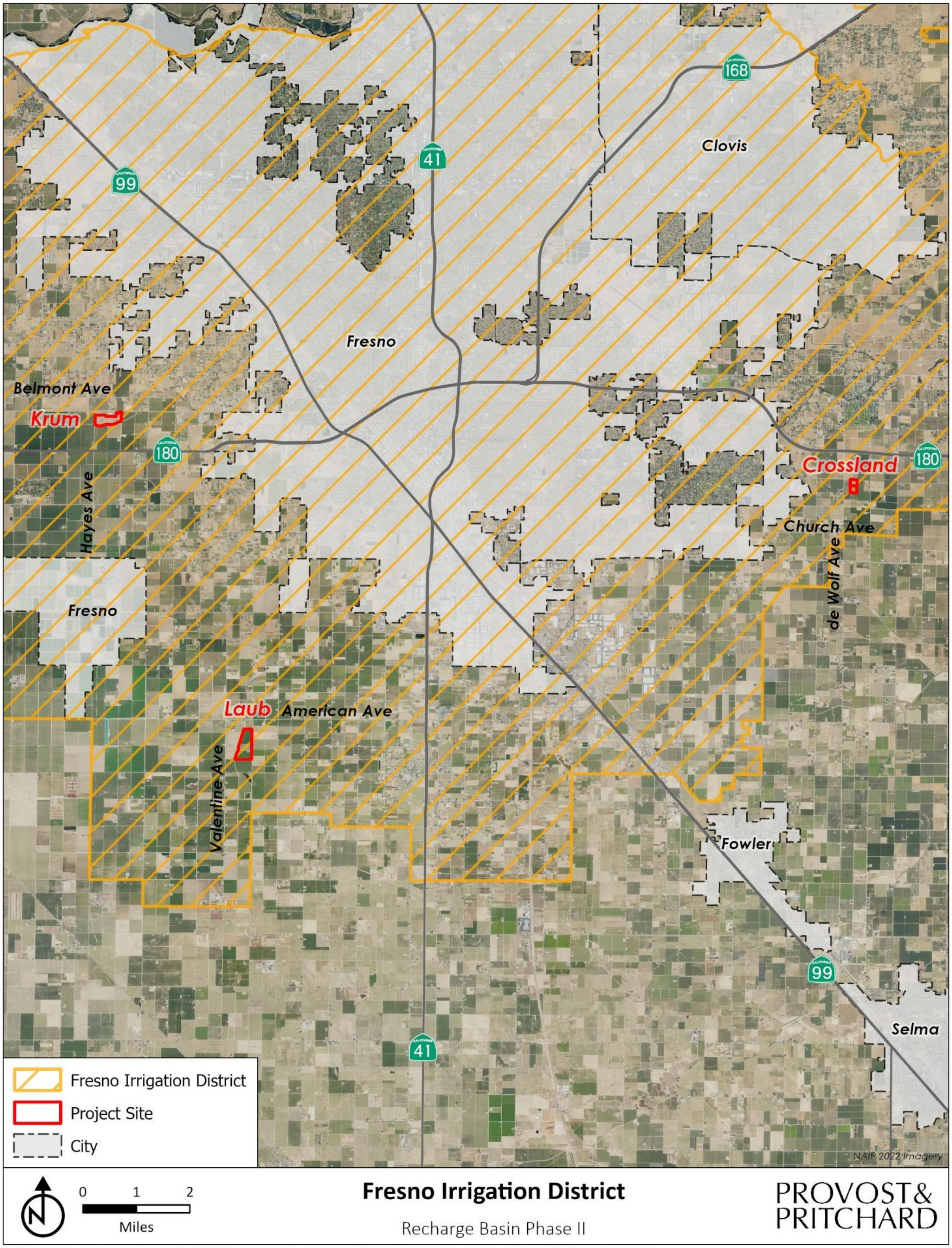

Figure 2-3: District Boundary Map

Figure 2-4: Krum Basin Aerial Map

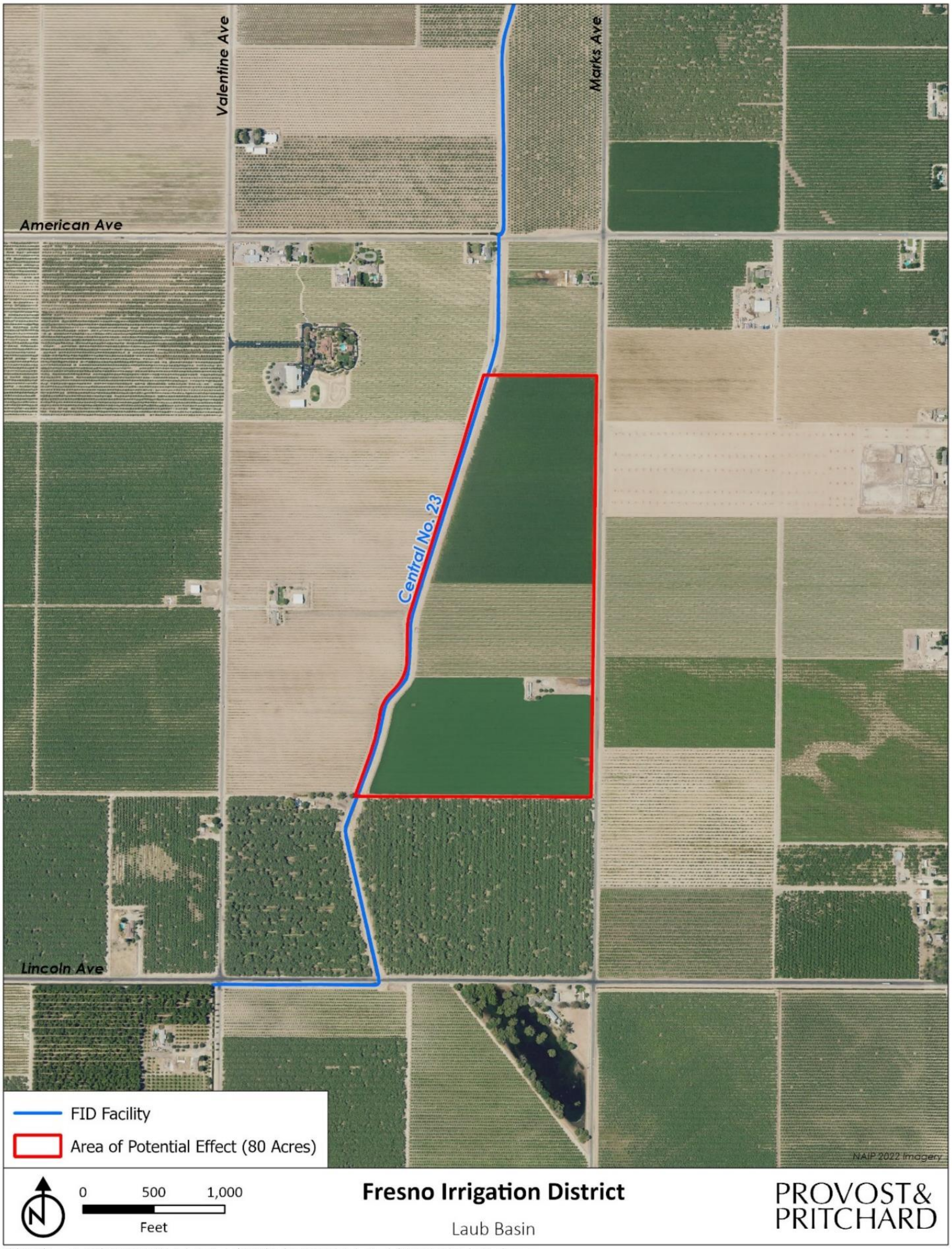

Figure 2-5: Laub Basin Aerial Map

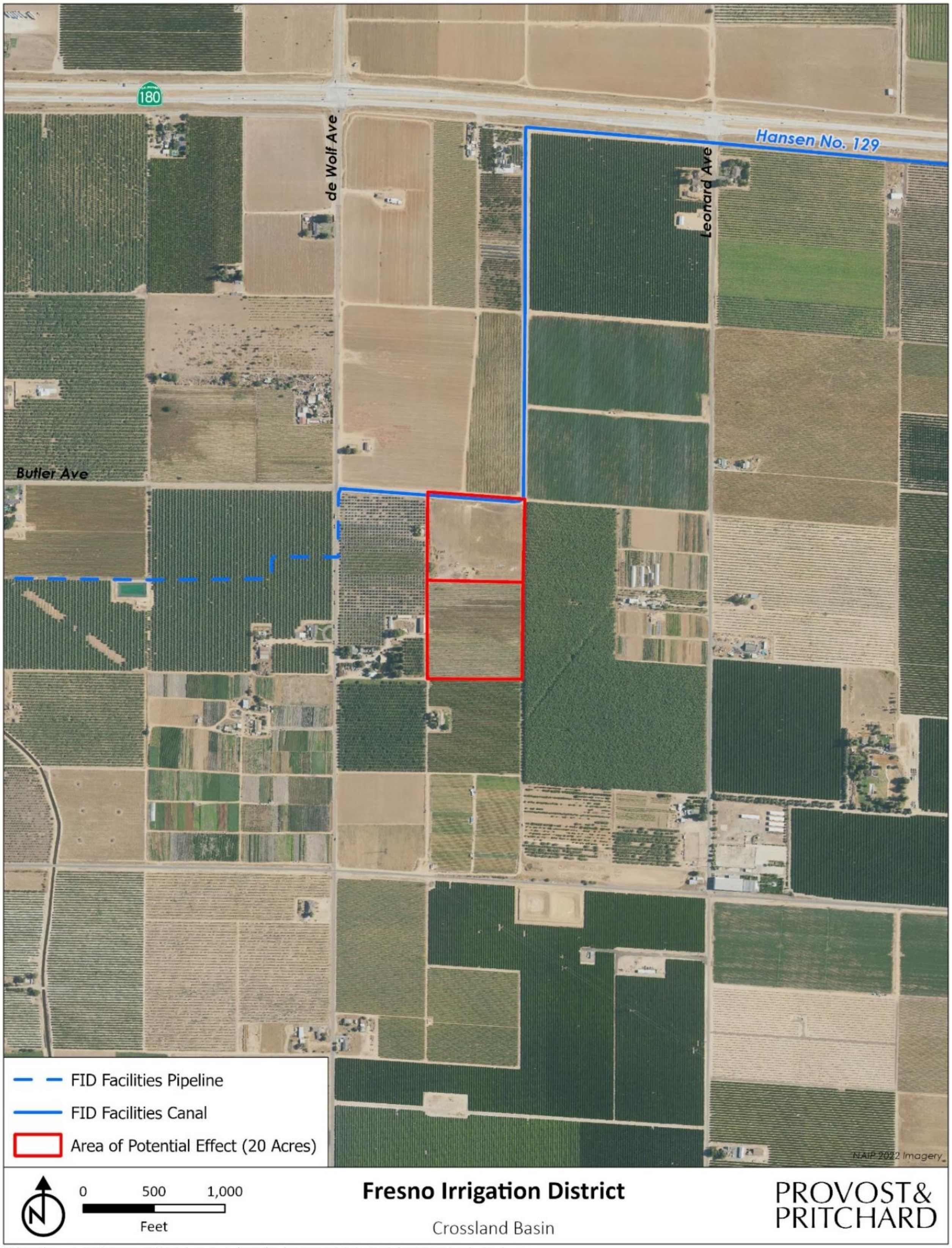

Figure 2-6: Crossland Basin Aerial Map

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]	APRIL 1, 2024
Signature	Date

LAURENCE KIMURA, CHIEF ENGINEER
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 western unincorporated jurisdiction of Fresno County in the Central San Joaquin Valley. Lands in the Project's vicinity consist of relatively flat, irrigated farmland, agricultural infrastructure, and rural residences. Scenic features in the area may include the San Joaquin River and even the vast expanse of agricultural uses. In Fresno County, a portion of State Route (SR) 180 E has been officially designated by Caltrans as a "State Scenic Highway," however that section is approximately 10 miles east of the Crossland basin site. Rural roadways, the California Aqueduct, local water distribution canals, water retention basins and other infrastructure typical of rural agricultural areas in the San Joaquin Valley are also prominent features in the Project area.

4.1.2 Impact Analysis

a) Have substantial adverse effect on a scenic vista?

No Impact. As stated above, scenic features in the area may include the San Joaquin River and even the vast expanse of agricultural uses. The Project would not obstruct the viewshed of these features during construction or implementation. The three proposed recharge basins would be constructed at approximately the same level as existing ground elevations in the areas, resulting in no potential views being obstructed. Additionally, the basins would be consistent with the overall character of the surrounding areas and would not stand out in any remarkable manner. There would be no impact.

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

No Impact. There are no identified scenic resources, trees, rock outcroppings, or historic buildings within the Project sites. There would be no components of the Project that would cause obstruction to the general public view of natural features, nor would the Project have an adverse effect on a scenic view. A 24-mile portion of SR 180, located in eastern Fresno County, is the only Officially Designated State Scenic Highway in Fresno County and is not located near the Project sites.[2] Although the Project is located in Fresno County, Project activities would be taking place approximately 10 miles west of the segment and do not have the potential to cause any adverse effects. 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 sites contain agricultural lands and agricultural infrastructure. The sites and surrounding lands are zoned for agriculture and are located in rural Fresno County. The proposed basins would blend in with the agricultural surroundings and would not substantially 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 sites contain agricultural lands and agricultural infrastructure. No artificial lighting is proposed to be on-site. Additional vehicular traffic to the sites after construction would likely be once-weekly daytime maintenance trips. Therefore, the Project would not create a new source of substantial light or glare which would adversely affect day or nighttime views in the area or be inconsistent with existing conditions. There would be no impact.

4.1.3 Federal Cross-Cutting Topic

Wild, Scenic, and Recreational Rivers Act

The National Wild and Scenic Rivers Act was established in 1968, to maintain the natural beauty, biology, and wildness of federally designated "wild," "scenic," or "recreational" rivers that may be threatened by construction of dams, diversions, and canals. The act seeks to preserve these designated rivers in their free-flowing condition, and to protect their immediate environments for the benefit and enjoyment of present and future generations. California has approximately 189,454-miles of river, of which approximately 1,999-miles are designated as wild & scenic—1% of the state's river miles.[3] There are no "wild" or "scenic" rivers within or proximate to any of the basin sites.

[2] (California Department of Transportation 2018)
[3] (National Wild and Scenic Rivers System 2022)

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 sites currently contain a total of approximately 154 acres of vacant farmland in Fresno County. The sites are situated in rural areas and substantially surrounded by agricultural uses and related infrastructure.

The California Department of Conservation's (DOC) 2012 Farmland Mapping and Monitoring Program (FMMP) is a non-regulatory program that produces "Important Farmland" maps and statistical data used for analyzing impacts on California's agricultural resources. The Important Farmland maps identify eight land use categories, five of which are agriculture related: prime farmland, farmland of Statewide importance, unique farmland, farmland of local importance, and grazing land – rated according to soil quality and irrigation status. The eight categories are summarized below[4]:

• PRIME FARMLAND (P): Farmland with the best combination of physical and chemical features able to sustain long term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.

[4] (California Department of Conservation 2016). Accessed October 2023.

• FARMLAND OF STATEWIDE IMPORTANCE (S): Farmland similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.

• UNIQUE FARMLAND (U): Farmland of lesser quality soils used for the production of the State's leading agricultural crops. This land is usually irrigated but may include non- irrigated orchards or vineyards as found in some climatic zones in California. Land must have been cropped at some time during the four years prior to the mapping date.

• FARMLAND OF LOCAL IMPORTANCE (L): Land of importance to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee.

• GRAZING LAND (G): Land on which the existing vegetation is suited to the grazing of livestock. The minimum mapping unit for Grazing Land is 40 acres.

• URBAN AND BUILT-UP LAND (D): 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, institutional, public administrative purposes, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes.

• OTHER LAND (X): 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 40 acres. Vacant and nonagricultural land surrounded on all sides by urban development and greater than 40 acres is mapped as Other Land.

• WATER (W): Perennial water bodies with an extent of at least 40 acres.

The State of California DOC 2012 FMMP for Fresno County designates the site as Semi-Ag, Farmland of Local Importance, Farmland of State Importance , Prime Farmland, as shown in Figure 4-1 and summarized in Table 4-3 below:

Table 4-3: Farmland Designations

Basin Name	Farmland Designation
Krum	Farmland of Local Importance; Semi-Ag
Laub	Prime Farmland
Crossland	Prime Farmland; Farmland of Statewide Importance; Farmland of Local Importance

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?

Less than Significant Impact. The Project sites are designated as Prime Farmland and Unique Farmland. See Figure 4-1. The Project would entail the construction of three recharge basins to replenish groundwater supplies by utilizing storm and flood water. These basins would ultimately benefit water resources that may be used for agricultural wells in the vicinity and thereby prevent other agricultural lands from being fallowed due to inadequate or costly recovery of declining groundwater water supply.

Groundwater replenishment associated with the Project is consistent with the goals of SGMA. Therefore, the impact would be less than significant.

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

Less than Significant Impact. Table 4-4 below lists all the parcels that are currently under Williamson Act either directly onsite or on an adjacent parcel. The construction and implementation of the three basins would facilitate greater security of groundwater storage for District growers, promoting the agricultural zoning and Williamson Act intentions. The principal objectives of the Williamson Act program include protection of agricultural resources, preservation of open space land, and promotion of efficient urban growth patterns. The implementation of recharge basins would promote groundwater security protecting agricultural resources and promotes efficient urban growth as the land is converting from agricultural uses to passively built-up land. The impacts would be less than significant.

Table 4-4: Williamson Act Parcels

APN	Onsite Parcels	Adjacent Parcel
Krum Basin	N/A	N/A
Laub Basin	035-300-41S	035-300-22, -46, -47, -72S
Crossland Basin	313-410-26	313-410-02, -23

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 is no timber land in the vicinity or in proximity to any of the sites; therefore, there would be no impact.

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?

d-e) No Impact. There is no forest or timberland located on or near the Project sites, nor are the sites zoned for forest land or timberland. The Project activities would not involve the conversion of any land that has been designated as timberland or forest as there is no such land in the immediate or surrounding areas. There would be no impact.

4.2.3 Federal Cross-Cutting Topic

Farmland Protection Act

The Farmland Protection and Policy Act (FPPA) was enacted in 1981 to minimize the loss of prime farmland and unique farmlands because of federal actions that converted these lands to nonagricultural uses. The act assures that federal programs are compatible with state and local governments, and private programs and policies to protect farmland.

As defined by the FPPA, prime farmland is farmland that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and also is available for these uses. A unique farmland is land other than prime farmland that is used for production of specific, high-value food and fiber crops; it has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality or high yields of specific crops.

The Project is located on lands classified by the DOC as either Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance. These classifications recognize a land' s suitability for agricultural production by considering the physical and chemical characteristics of the soil, such as soil temperature range, depth of the groundwater table, flooding potential, rock fragment content, and rooting depth. The classifications also consider location, growing season, and moisture available to sustain high-yield crops. Together, Important Farmland and Grazing Land are defined by the DOC as "Agricultural Land."

The Project is located on lands that are classified as "Prime Farmland," which consists of lands suited for Farmland with the best combination of physical and chemical features able to sustain long term agricultural production. This type of farmland 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. Therefore, no farmland would be converted as a result of the Project. Therefore, the Project would not conflict with the FPPA or adversely affect prime or unique farmland.

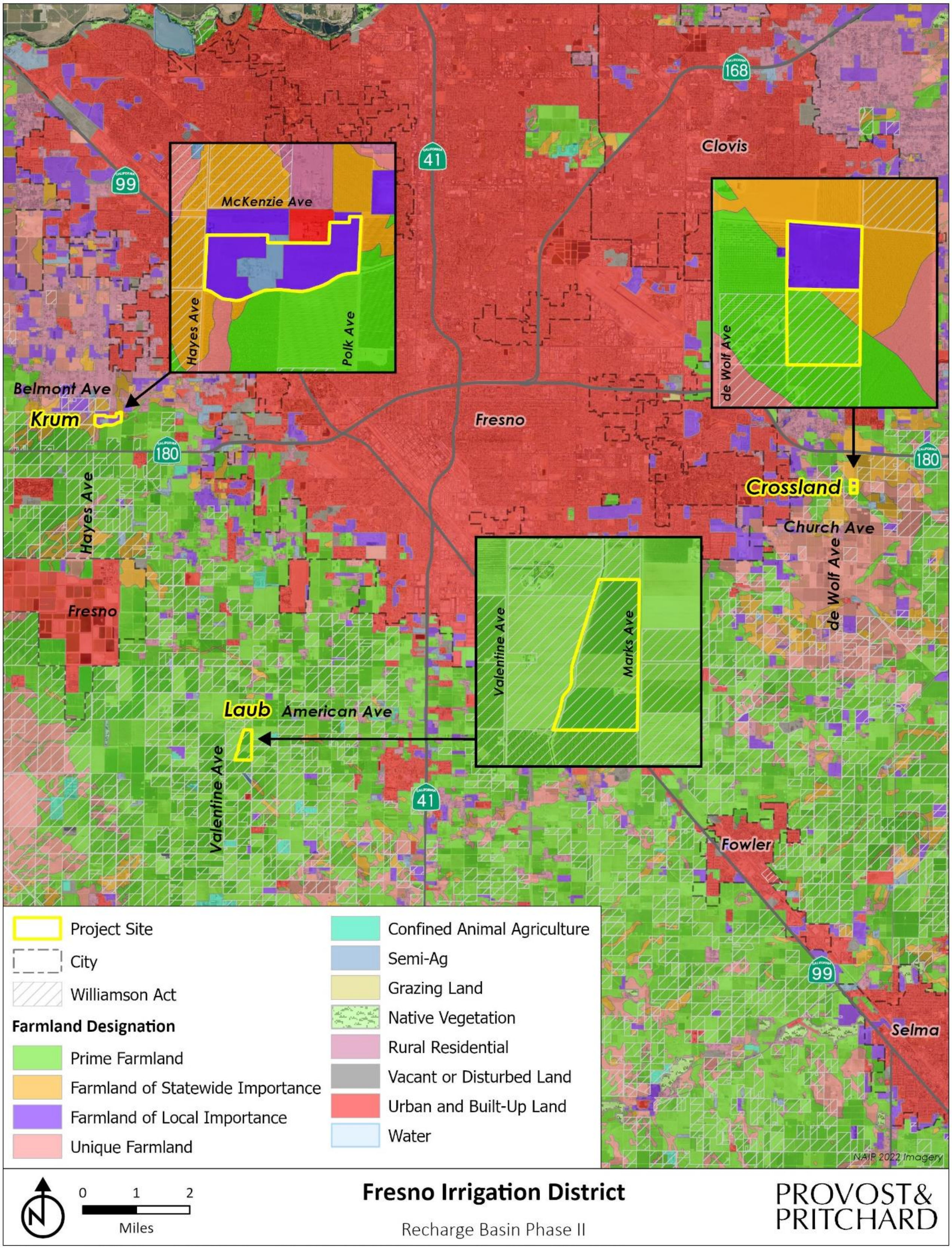

Figure 4-1: FMMP Map

4.3 AIR QUALITY

Table 4-5: 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 site is located 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.[5] 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.

Regulatory Attainment Designations

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 USEPA designates areas for ozone, CO, and 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

[5] (San Joaquin Valley Air Pollution Control District 2012)

national standards." However, the CARB terminology of attainment, nonattainment, and unclassified is more frequently used. 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 PM_{10} based on the likelihood that they would violate national PM_{10} standards. All other areas are designated "unclassified."

According to the USEPA Fresno County was not in non-attainment for two pollutant concentrations, with PM-2.5 (2012) being classified as in serious non-attainment, and 8-hour Ozone (2015) classified as being in extreme non-attainment as of March 4, 2024.[6]

[6] (United States Environmental Protection Agency 2023)

Table 4-6: 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 ppm	Nonattainment/ Severe	–	No Federal Standard
	8-hour	0.070 ppm	Nonattainment	0.075 ppm	Nonattainment (Extreme)**
Particulate Matter (PM_{10})	AAM	20 µg/m^3	Nonattainment	–	Attainment
	24-hour	50 µg/m^3		150 µg/m^3	
Fine Particulate Matter ($PM_{2.5}$)	AAM	12 µg/m^3	Nonattainment	12 µg/m^3	Nonattainment
	24-hour	No Standard		35 µg/m^3	
Carbon Monoxide (CO)	1-hour	20 ppm	Attainment/ Unclassified	35 ppm	Attainment/ Unclassified
	8-hour	9 ppm		9 ppm	
	8-hour (Lake Tahoe)	6 ppm		–	
Nitrogen Dioxide (NO_2)	AAM	0.030 ppm	Attainment	53 ppb	Attainment/ Unclassified
	1-hour	0.18 ppm		100 ppb	
Sulfur Dioxide (SO_2)	AAM	–	Attainment	--	Attainment/ Unclassified
	24-hour	0.04 ppm		--	
	3-hour	–		0.5 ppm	
	1-hour	0.25 ppm		75 ppb	
Lead (Pb)	30-day Average	1.5 µg/m^3	Attainment	–	No Designation/ Classification
	Calendar Quarter	–		--	
	Rolling 3-Month Average	–		0.15 µg/m^3	
Sulfates (SO_4)	24-hour	25 µg/m^3	Attainment	No Federal Standards	
Hydrogen Sulfide (H_2S)	1-hour	0.03 ppm (42 µg/m^3)	Unclassified		
Vinyl Chloride (C_2H_3Cl)	24-hour	0.01 ppm (26 µg/m^3)	Attainment		
Visibility-Reducing Particle Matter	8-hour	Extinction coefficient: 0.23/kilometer-visibility of 10 miles or more due to particles when the relative humidity is less than 70%.	Unclassified		

** 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 10/25/23.*
****Secondary Standard*
µg/m3: micrograms per cubic meter
Source: (San Joaquin Valley Air Pollution Control District 2012)

Construction-Generated Emissions

Construction of the Project is assumed to be completed over the course of approximately three years, with each of the three basins being constructed within approximately six months, starting each fall from the years 2025-2027. Emissions associated with the Project were calculated using CalEEMod Air Quality Model, Version 2022.1.1.20. The emissions modeling includes emissions generated by off-road equipment, haul trucks, and worker commute trips. Emissions were quantified based on a worst-case scenario of each basin being developed over the same six-month span, commencing in fall of 2025. All other assumptions are based upon the default parameters contained in the model. Localized air quality impacts associated with the Project would be minor and were qualitatively assessed. Modeling assumptions and output files are included in Appendix A.

Thresholds of Significance

Air pollutant emissions have regional effects and localized effects. This analysis assesses the regional effects of the Project's criteria pollutant emissions in comparison to SJVAPCD thresholds of significance for short-term construction activities and long-term operation of the Project. Localized emissions from Project construction and operation are also assessed using concentration-based thresholds that determine if the Project would result in a localized exceedance of any ambient air quality standards or would make a cumulatively considerable contribution to an existing exceedance.

The primary pollutants of concern during Project construction and operation are ROG (reactive organic gases), NO_X, PM_{10}, and $PM_{2.5}$. The SJVAPCD Guide for Assessing and Mitigating Air Quality Impacts (GAMAQI) adopted in 2015 contains thresholds for ROG and Nitrogen Oxides (NOX); Sulfur Oxides (SOX), CO, PM_{10}, and $PM_{2.5}$.

Ozone is a secondary pollutant that can be formed miles away from the source of emissions through reactions of ROG and NO_X emissions in the presence of sunlight. Therefore, ROG and NO_X are termed ozone precursors. The SJVAB often exceeds the state and national ozone standards. Therefore, if the Project emits a substantial quantity of ozone precursors, the Project may contribute to an exceedance of the ozone standard. The SJVAB also exceeds air quality standards for PM_{10}, and $PM_{2.5}$; therefore, substantial Project emissions may contribute to an exceedance for these pollutants.

The SJVAPCD adopted significance thresholds for construction-related and operational ROG, NO_X, PM, CO, and SO_X, these thresholds are included in Table 4-7.

Table 4-7: Project-Level Air Quality CEQA Thresholds of Significance

Pollutant	Significance Threshold	
	Construction Emissions (tons/year)	Operational Emissions (tons/year)
CO	100	100
NO_x	10	10
ROG	10	10
SO_x	27	27
PM_{10}	15	15
$PM_{2.5}$	15	15

Source: SJVAPCD. 2015. Guidance for Assessing and Mitigating Air Quality Impacts. Website: https://www.valleyair.org/transportation/GAMAQI-2015/FINAL-DRAFT-GAMAQI.PDF. Accessed October 25, 2023.

4.3.2 Impact Analysis

Short-Term Construction-Generated Emissions

Estimated construction-generated emissions are summarized in Table 4-8. Due to the passive nature of basins, long-term operational emissions would be negligible and would not exceed any set threshold governing air quality emission generation within the SJVAPCD.

Table 4-8: Unmitigated Short-Term Construction Generated Emissions of Criteria Air Pollutants

Source	Annual Emissions (TPY[1])					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Maximum Annual Project Construction Emissions	0.17	1.54	1.53	<0.005	0.28	0.15
SJVAPCD Threshold	*10*	*10*	*100*	*27*	*15*	*15*
Threshold Exceeded?	No	No	No	No	No	No
[1]TPY – Tons per Year						

Maximum Daily Emissions of Criteria Air Pollutants

Daily construction emissions generated by the Project are summarized in Table 4-9.

Table 4-9: Maximum Daily Emissions of Criteria Air Pollutants

Source	Daily Emissions Maximum (in pounds)					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Construction – Summer	6.63	59.1	61.3	0.11	11.7	6.50
Construction – Winter	3.27	29.7	28.9	0.06	4.93	2.59
SJVAPCD Threshold	*100*	*100*	*100*	*100*	*100*	*100*
Threshold Exceeded?	No	No	No	No	No	No

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

No Impact. The Project would not conflict with or obstruct implementation of any applicable air quality plan. The proposed Project would not exceed any threshold for air quality emissions that has been set by the SJVAPCD. Therefore, there would be no impact.

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?

Less than Significant Impact. The proposed Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is in non-attainment. As shown in Table 4-8, and Table 4-9, the Project would not exceed an emissions threshold which has been set by the SJVAPCD for construction related emissions. Due to the passive nature of basins, long-term operational emissions would be negligible and would not exceed any set threshold governing air quality emission generation within the SJVAPCD. Therefore, impacts would be less than significant.

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

Less than Significant Impact. The Project would not expose sensitive receptors to substantial pollutant concentrations. Sensitive Receptors are groups that would be more affected by air, noise, and light pollution, pesticides, and other toxic chemicals than others. This includes infants, children under 16, elderly over 65, athletes, and people with cardiovascular and respiratory diseases. High concentrations of these groups would include daycares, residential areas, hospitals, elder care facilities, schools and parks. The Project would be constructed within 60 feet of the nearest rural residential home in proximity to the Project, with other residences being located in the area as well, exposing potential sensitive receptors to exhaust pollutants emitted by construction equipment. However, the HARP2 air dispersion model was run for the Krum Basin site, which is located adjacent to single family homes, to show the health risk for sensitive receptors. While the Crossland Basin site is also located in proximity to single family rural residential homes, the Krum Basin site was the site nearest to a home and would be larger than the Crossland Basin site, resulting in more emissions at this location, making it a better site to analyze within the HARP2 model. The analysis provides for the worst-case scenario of the Project due to its proximity to sensitive receptors. The model run, which can be viewed in Appendix A, indicates that the Project would result in a cancer risk of 0.0014341 in one million, which is less than the SJVAPCD's significance threshold of 20 in one million. The Project would also present a chronic risk of 0.0000029963 in one million and an acute risk of 0 in one million, which would be less than the SJVAPCD's threshold of one in one million for both chronic and acute. As a result, impacts 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. During construction activities, construction equipment exhaust and application of asphalt, structural coating and other construction applications would temporarily emit odors. Construction would be completed within several rural portions of Fresno County and would have an effect on some rural residences which would be located near the construction area of the Project. Construction of the Project would be temporary, and odors would not remain after Project completion. Therefore, impacts would be less than significant.

4.3.3 Federal Cross-Cutting Topics

Clean Air Act (CAA)

Under the federal CAA, federal actions conducted in air basins that are not in attainment with the federal ozone standard (such as the SJVAB) must demonstrate conformity with the State Implementation Plan (SIP). Conformity to a SIP is defined in the federal CAA as meaning conformity to a SIP's purpose of eliminating or reducing the severity and number of violations of the national standards and achieving an expeditious attainment of such standards. The SJVAPCD has published Regulation IX, Rule 9110 (referred as the General Conformity Rule) that indicates how most federal agencies can make such a determination.[7]

The SJVAPCD specifies that a project is conforming to the applicable attainment or maintenance plan if it:

- complies with all applicable SJVAPCD rules and regulations,
- complies with all applicable control measures from the applicable plans, and
- is consistent with the growth forecast in the applicable plans.

The SJVAPCD does not require a detailed quantification of construction emissions unless the project's indirect source emissions are expected to increase pollutant emissions of ROG or NOx in excess of 10 TPY. Because proposed Project construction would not exceed this threshold, the proposed project would comply with the conformity criteria.

[7] The SJVAPCD's Rule 9110 is consistent with USEPA 's General Conformity Rule, Determining Conformity of General Federal Actions to State or Federal Implementation Plans (40 CFR, Part 93), available online at http://www.valleyair.org/rules/currntrules/r9110.pdf.

4.4 BIOLOGICAL RESOURCES

Table 4-10: 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

The three proposed basin sites are located Fresno County within the San Joaquin Valley. The topography of each basin site is relatively flat. The elevation for the Krum Basin ranges between 258 and 262 feet above MSL. The elevation for the Laub Basin ranges between 256 and 259 feet above MSL. The elevation for the Crossland Basin ranges between 337 and 340 feet above MSL.

Climate

Like most of California, the proposed basin sites experience a Mediterranean climate. Warm, dry summers are followed by cool, moist winters. In the summer, average high temperatures range between 90- and 99-degrees Fahrenheit (°F), but does not often exceed 105 °F, and the humidity is generally low. Winter temperatures are often below 54°F during the day and rarely exceed 64°F. On average, the City of Fresno receives 12 inches of precipitation in the form of rain yearly, most of which occurs between October and May[8]. The APEs would be expected to receive similar amounts of precipitation.

Hydrology

The hydrology of each APE is as follows:

- Krum Basin: the nearest surface water is Houghton Canal No. 78 which is located adjacent to the south boundary of the APE.
- Laub Basin: the nearest surface water is Central Canal No. 23, which is located along the west boundary of the APE. An unnamed dirt ditch is also located in the center of the APE, flowing west to east.
- Crossland Basin: the nearest surface water is the Hansen Canal No. 129, which is located within the northern portion of the APE.

Soils

Ten soil mapping units representing seven soil types were identified within the APEs and can be found in Appendix B. Appendix B contains the soil's core properties, according to the Major Land Resource Area of California.

Biotic Habitats

Three biotic habitats were observed within the APEs and included agricultural, ruderal, and canal/ditch. These biotic habitats and their constituent plant and animal species are described in more detail below.

Agricultural

The Laub Basin APE consisted of large areas with active agricultural fields planted with alfalfa (*Medicago sativa*). All three APEs contained agricultural fields or orchards within the 50-foot buffer outside of the project sites. While this habitat is regularly disturbed by agricultural activities, disturbance tolerant species would be expected to use this habitat, such as coyote (*Canis latrans*), raccoon (*Procyon lotor*), various bat and bird species, and other species common in this area.

Ruderal

The majority of the Krum Basin and Crossland Basin APEs included ruderal habitat. The Laub Basin APE also contained large areas of ruderal habitat. The ruderal habitat within these APEs consisted of hard-packed dirt roads and fallow agricultural fields. Vegetation observed in this habitat included invasive grasses, bromes (*Bromus* spp.), sacred datura (*Datura wrightii*), Russian thistle (*Salsola tragus*), sunflower (*Helianthus* sp.), field bindweed (*Convolvulus arvensis*), false daisy (*Eclipta prostrata*), Bermuda grass (*Cynodon dactylon*), horseweed (*Erigeron canadensis),* common cocklebur (*Xanthium orientale),* hairy fleabane (*Erigeron bonariensis),* telegraphweed (*Heterotheca grandiflora),* nettle-leaved goosefoot (*Chenopodiastrum murale*)*,* tree of heaven (*Ailanthus altissima*)*,* puncture vine (*Tribulus terrestis*), and Johnson grass (*Sorghum halepense*).

The survey of the ruderal habitat resulted in the observation of mourning dove (*Zenaida macroura*), white-crowned sparrow (*Zonotrichia leucophrys*), black phoebe (*Sayornis nigricans*), and California scrub jay (*Aphelocoma californica)*. Other species, or their sign, which was detected included western fence lizard (*Sceloporus occidentalis*), coyote scat and tracks, dog (*Canis lupus familiaris*) tracks, and California ground

[8] (Weather Spark 2023)

squirrels and their burrows. The Crossland Basin APE also contained cement pipes which could be used by San Joaquin kit fox (*Vulpes marotis mutica*) as atypical dens.

Canal/Ditch

Within each APE was canal/ditch habitat: Houghton No. 78 canal and a small dirt ditch was located within the Krum Basin APE, Central No. 23 canal was located within the Laub Basin APE, and Hansen Canal No. 129 was located within the Crossland Basin APE. During the field survey the canal/ditch habitat excluding the dirt ditch within the Krum Basin APE was full of water and contained minimal vegetation including young willows (*Salix* sp.), flax leaved horseweed (*Conyza bonariensis*), tall flatsedge (*Cyperus eragrostis*), and sedge (*Carex* sp.) on the canal/ditch edges. Various wildlife that would be found in the agricultural habitat and ruderal habitat would visit the canal/ditch habitat to drink water. Various species may utilize the canal/ditch habitat as a wildlife movement corridor.

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. The California Department of Fish and Wildlife (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 CDFW managed California Natural Diversity Database (CNDDB). According to the CNDDB and the field survey, no natural communities of special concern were present within the APEs or within ten miles of the APEs.

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. No natural waterways or riparian habitat were observed within or adjacent to the APEs.

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 system (IPaC), designated critical habitat is absent from the APEs and vicinity.

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 APEs contain various canals/ditches that may function as wildlife movement corridors.

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. The Krum Basin APE has suitable features (i.e., an underground concrete structure) that could be used by maternity roosting bats. The Laub and Crossland Basin APEs do not contain areas that would be expected to be used as a native wildlife nursery site.

Special Status Plants and Animals

A query of the CNDDB for occurrences of special status plant and animal species was conducted for the Fresno South, Kearney Park, and Malaga 7.5-minute U.S. Geological Survey (USGS) quadrangles that contain the APEs, and for the 12 surrounding USGS quadrangles: Biola, Caruthers, Clovis, Conejo, Fresno North Helm, Herndon, Kerman, Raisin, Round Mountain, Sanger, and Selma. A query of the IPaC was also completed for the APEs. These species, and their potential to occur within the APEs, are listed in Table 4-11 and Table 4-12 below this section. 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 4-12.

Table 4-11: List of Special Status Plants with Potential to Occur on the APEs and/or in the Vicinity

Species	Status*	Habitat	Occurrence within the APEs		
			Krum Basin	Laub Basin	Crossland Basin
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.	**Absent.** Vernal pool and wet saline flat habitats were absent within this APE and surrounding areas.	**Absent.** Vernal pool and wet saline flat habitats were absent within this APE and surrounding areas.	**Absent.** Vernal pool and wet saline flat habitats were absent within this APE and surrounding areas.
Bristly sedge (*Carex comosa*)	CNPS 2B	Found in marshes, swamps, coastal prairies, and valley and foothill grasslands, often along lake margins and wet areas at elevations between -16 and 3,310 feet. Areas below sea level occur on a Delta Island. Blooms May – September.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.
Brittlescale (*Atriplex depressa*)	CNPS 1B	Found in the Central Valley in alkaline or clay soils, typically in meadows or annual grasslands at elevations below 1,100 feet. Sometimes associated with vernal pools. Blooms June – October.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.
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.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.
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.	**Unlikely.** While sandy soils were present within this APE, frequent disturbances due to past agricultural use make it unlikely for this species to occur within this APE. The nearest recorded observation of this species within the vicinity was approximately 2 miles east of this APE in 1986.	**Unlikely.** While sandy soils were present within this APE, frequent disturbances due to past and current agricultural use make it unlikely for this species to occur within this APE. The nearest recorded observation of this species within the vicinity was approximately 4 miles north of this APE in 1986.	**Unlikely.** While sandy soils were present within this APE, due to habitat conversion to agricultural fields that were frequently disced, it is unlikely the species could establish within this APE. The nearest recorded observation of this species within the vicinity was approximately 3.5 miles west of this APE in 1986.

Species	Status*	Habitat	Occurrence within the APEs		
			Krum Basin	Laub Basin	Crossland Basin
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.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.
Forked hare-leaf (*Lagophylla dichotoma*)	CNPS 1B	Found in cismontane woodland, and valley and foothill grassland communities at elevations between 600 and 1,100 feet. Blooms April – May.	**Absent.** Habitat for this species was not observed, and this APE is outside of the elevational range of this species.	**Absent.** Habitat for this species was not observed, and this APE is outside of the elevational range of this species.	**Absent.** Habitat for this species was not observed, and this APE is outside of the elevational range of this species.
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.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.
Hairy Orcutt grass (*Orcuttia pilosa*)	FE, CE, CNPS 1B	Found in vernal pools in valley grassland, wetland, and riparian communities at elevations below 650 feet. Blooms May – September.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.
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.	**Absent.** Suitable habitats, saline, and alkaline soils were absent within this APE.	**Absent.** Suitable habitats, saline, and alkaline soils were absent within this APE.	**Absent.** Suitable habitats, saline, and alkaline soils were absent within this APE.
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.	**Absent.** Suitable habitats and alkaline soils were absent within this APE.	**Absent.** Suitable habitats and alkaline soils were absent within this APE.	**Absent.** Suitable habitats and alkaline soils were absent within this APE.

Species	Status*	Habitat	Occurrence within the APEs		
			Krum Basin	Laub Basin	Crossland Basin
Madera leptosiphon (*Leptosiphon serrulatus*)	CNPS 1B	Found within openings of foothill woodland, often yellow-pine forest, and chaparral at elevations between 1,000 and 4,300 feet. Blooms April – May.	**Absent.** This APE is well outside of the elevational range of this species.	**Absent.** This APE is well outside of the elevational range of this species.	**Absent.** This APE is well outside of the elevation range of this species.
Palmate-bracted bird's beak (*Chloropyron palmatum*)	FE, CE, CNPS 1B	Found in the Central Valley in alkaline soils (usually Pescadero silty clay) in chenopod scrub, as well as valley and foothill grassland communities at elevations below 500 feet. Blooms June – August.	**Absent.** Suitable habitats and alkaline soils were absent within this APE.	**Absent.** Suitable habitats and alkaline soils were absent within this APE.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.
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.	**Absent.** Suitable habitats and alkaline soils were absent within this APE.	**Absent.** Suitable habitats and alkaline soils were absent within this APE.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.
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.	**Absent.** This APE is outside of the elevational range of this species.	**Absent.** This APE is outside of the elevational range of this species.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.
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.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.

Species	Status*	Habitat	Occurrence within the APEs		
			Krum Basin	Laub Basin	Crossland Basin
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.	**Unlikely.** The canal habitat within this APE was concrete-lined making it unlikely for this species to occur within this APE. The nearest recorded observation of this species within the vicinity was approximately 4 miles north of this APE in 2020.	**Possible.** The canal within this APE was concrete-lined but this species could occur within the dirt ditch present within this APE. The nearest recorded observation of this species within the vicinity was approximately 10.5 miles northwest of this APE in 2020.	**Possible.** This species could occur within the dirt lined canal when it is inundated. The nearest recorded observation of this species within the vicinity was approximately 7 miles northwest of this APE in 1993.
Spiny-sepaled button-celery (*Eryngium spinosepalum*)	CNPS 1B	Found in the Sierra Nevada foothills and the San Joaquin Valley. Occurs 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.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.
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.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.
Succulent owl's-clover (*Castilleja campestris* var. *succulenta*)	FT, CE, CNPS 1B	Found in vernal pools, often in acidic soils at elevations below 2,500 feet. Blooms April – July.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.

Table 4-12: List of Special Status Animals with Potential to Occur on the APEs and/or in the Vicinity

Species	Status*	Habitat	Occurrence within the APEs		
			Krum Basin	Laub Basin	Crossland Basin
American badger (*Taxidea taxus*)	CSSC	Occurs most abundantly in 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.	**Possible.** This species could burrow within the canal banks, or the ruderal habitat of this APE. California ground squirrel burrows were present throughout this APE and could be utilized by this species. This species could also use the canals in the APE as a wildlife movement corridor. The nearest recorded observation of this species within the vicinity was approximately 11.5 miles northeast of this APE in 1987.	**Possible.** This species could burrow within the canal banks, or the ruderal habitat within this APE. This species could also use the canals in the APE as a wildlife movement corridor. The nearest recorded observation of this species within the vicinity was approximately 12 miles northeast of this APE in 1987.	**Possible.** This species could burrow within the canal banks, or the ruderal habitat of this APE. California ground squirrel burrows were present throughout this APE and could be utilized by this species. This species could also use the canals in the APE as a wildlife movement corridor. The nearest recorded observation of this species within the vicinity was approximately 5 miles northwest of this APE in 1987.
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 98 to 2,600 feet. They are absent from areas with steep slopes and dense vegetation, and areas subject to seasonal flooding. Known to bask on kangaroo rat mounds and often seeks shelter at the base of shrubs, in small mammal burrows, or in rock piles. Adults may excavate shallow burrows but rely on deeper pre-existing rodent burrows for hibernation and reproduction.	**Absent.** While there was loose soil within this APE, this APE and surrounding areas lacked suitable vegetation and prey base for this species.	**Absent.** While there was loose soil within this APE, this APE and surrounding areas lacked suitable vegetation and prey base for this species.	**Absent.** While there was loose soil within this APE, this APE and surrounding areas lacked suitable vegetation and prey base for this species.

Species	Status*	Habitat	Occurrence within the APEs		
			Krum Basin	Laub Basin	Crossland Basin
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.** While no sign (i.e., whitewash, feathers, pellets) of this species was observed during the field survey, this species could burrow within the canal banks, or the ruderal habitat. California ground squirrel burrows were present throughout the APE and could be utilized by this species. The nearest recorded observation of this species within the vicinity was approximately 7 miles southwest of this APE in 2005.	**Possible.** While no sign (i.e., whitewash, feathers, pellets) of this species was observed during the field survey, this species could burrow within the canal banks, or the ruderal habitat. The nearest recorded observation of this species within the vicinity was approximately 7 miles west of this APE in 2005.	**Possible**. While no sign (i.e., whitewash, feathers, pellets) of this species was observed during the field survey, this species could burrow within the canal or use one of the many California ground squirrel burrows found within the APE. The nearest recorded observation of this species within the vicinity was approximately 3 miles north of the APE in 1990.
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 expanse 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.** Suitable nesting and foraging habitats were absent within this APE and surrounding areas. This species could fly over this APE but would not be expected to nest or forage within this APE. The CNDDB query resulted in no observations of this species within the regional vicinity of this APE.	**Unlikely.** Suitable nesting and foraging habitats were absent within this APE and surrounding areas. This species could fly over this APE but would not be expected to nest or forage within this APE. The CNDDB query resulted in no observations of this species within the regional vicinity of this APE.	**Unlikely.** Suitable nesting and foraging habitats were absent within this APE and surrounding areas. This species could fly over this APE but would not be expected to nest or forage within the sites. The CNDDB query resulted in no observations of this species within the regional vicinity of this APE.
California glossy snake (*Arizona elegans occidentalis*)	CSSC	Inhabits arid scrub, rocky washes, grasslands, and chaparral. Prefers open areas with loose soil for easy burrowing. This species occurs from the eastern part of the San Francisco Bay Area south to northwestern Baja California but is absent along the central coast.	**Absent.** While loose soils were present within this APE, suitable habitat was absent and past disturbances due to agricultural use make it unlikely for this species to occur within this APE.	**Absent.** While loose soils were present within this APE, suitable habitat was absent and past disturbances due to agricultural use make it unlikely for this species to occur within this APE.	**Absent.** While loose soils were present within this APE, suitable habitat was absent and past disturbances due to agricultural use make it unlikely for this species to occur within this APE.
California tiger salamander (*Ambystoma californiense*)	FT, CT	Requires vernal pools or seasonal ponds for breeding and small mammal burrows for aestivation. Generally found in grassland and oak	**Absent.** Suitable breeding habitat was absent within this APE and surrounding areas. Furthermore, frequent disturbances due to past	**Absent.** Suitable breeding habitat was absent within this APE and surrounding areas. Furthermore, frequent disturbances due to past and	**Absent**. Suitable breeding habitat was absent within this APE and surrounding areas. Furthermore, frequent disturbances due to past

Species	Status*	Habitat	Occurrence within the APEs		
			Krum Basin	Laub Basin	Crossland Basin
		savannah plant communities in central California from sea level to 1,500 feet in elevation. Can migrate up to 1.3 miles to breed.	agricultural use make it unlikely for this species to occur within this APE.	current agricultural use make it unlikely for this species to occur within this APE.	agricultural use make it unlikely for this species to occur within this APE.
Coast horned lizard (*Phrynosoma blainvillii*)	CSSC	Found in grasslands, coniferous forests, woodlands, and chaparral, primarily in open areas with patches of loose, sandy soil and low-lying vegetation in valleys, foothills, and semi-arid mountains. Frequently found near ant hills and along dirt roads in lowlands along sandy washes with scattered shrubs.	**Unlikely.** While loose soils were present within this APE, past agricultural use on the site and existing agricultural fields and residences surrounding the site have likely eliminated this species from occurring within the area and this APE. The nearest recorded observation of this species within the vicinity was approximately 2 miles east of this APE in 1893.	**Unlikely.** While loose soils were present within this APE, past agricultural use on the site and existing agricultural fields and residences surrounding the site have likely eliminated this species from occurring within the area and this APE. The nearest recorded observation of this species within the vicinity was approximately 4 miles north of this APE in 1893.	**Unlikely.** While loose soils were present within this APE, past agricultural use on the site and existing agricultural fields and residences surrounding the site have likely eliminated this species from occurring within the area and this APE. The nearest recorded observation of this species within the vicinity was approximately 5 miles northwest of this APE in 1893.
Crotch 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*.	**Unlikely.** This APE and the surrounding areas have been regularly maintained for irrigation and agricultural purposes and plants this species forages on were absent from this APE. The nearest recorded observation of this species within the vicinity was approximately 2 miles east of this APE in 1899.	**Unlikely.** This APE and the surrounding areas have been regularly maintained for irrigation and agricultural purposes and plants this species forages on were absent from this APE. The nearest recorded observation of this species within the vicinity was approximately 4 miles north of this APE in 1899.	**Unlikely.** This APE and the surrounding areas have been regularly maintained for irrigation and agricultural purposes and plants this species forages on were absent from this APE. The nearest recorded observation of this species within the vicinity was approximately 5 miles northwest of this APE in 1899.
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 habitat requirements needed for the species to forage were not observed within this APE. There were small mammal burrows within this APE but there was no evidence of kangaroo rat activity (i.e., tail-drag marks). The nearest recorded observation of this species within the vicinity was approximately 2.5 miles	**Unlikely.** The habitat requirements needed for the species to forage were not observed within this APE. Frequent disturbances due to past and current agricultural use make it unlikely for this species to occur within this APE. The nearest recorded observation of this species within the vicinity was approximately 4 miles southwest of this APE in 1974.	**Unlikely.** The habitat requirements needed for the species to forage were not observed within this APE. There were a few small mammal burrows on the dirt road adjacent to the dirt canal but there was no evidence of kangaroo rat activity (i.e., tail-drag marks). The nearest recorded observation of this species within the vicinity was

Species	Status*	Habitat	Occurrence within the APEs		
			Krum Basin	Laub Basin	Crossland Basin
			northeast of this APE in 1898 but is listed as extirpated.		approximately 10.5 miles northwest of this APE in 1898 but is listed as extirpated.
Giant gartersnake (*Thamnophis gigas*)	FT, CT	Occurs in marshes, sloughs, canals, ditches, rice fields, and adjacent uplands. Prefers locations with emergent vegetation for cover and open areas for basking. This species uses small mammal burrows adjacent to aquatic habitats for hibernation in the winter and to escape from excessive heat in the summer.	**Unlikely.** The canal within this APE was concrete-lined and contained minimal to no emergent vegetation. The nearest recorded observation of this species within the vicinity was approximately 17.5 miles southwest of this APE in 1992.	**Unlikely.** The canal within this APE was concrete-lined and contained minimal to no emergent vegetation. The small dirt ditch did not contain suitable habitat for giant gartersnake. The nearest recorded observation of this species within the vicinity was approximately 13.5 miles southwest of this APE in 1992.	**Unlikely.** The dirt canal within this APE did not contain suitable habitat for giant gartersnake. The nearest recorded observation of this species within the vicinity was approximately 25 miles southwest of this APE in 1992.
Least Bell's vireo (*Vireo bellii pusillus*)	FE, CE	This migratory species breeds in southern California. Breeding habitat consists of dense, low, shrubby, riparian vegetation in the vicinity of water or dry river bottoms. By the early 1980s, this species was extirpated from most of its historic range in California, including the Central Valley.	**Unlikely.** Suitable nesting habitat was absent within this APE and surrounding areas. This species could forage over the ruderal field, but it would be expected to fly away during project activities. The nearest recorded observation of this species within the vicinity was approximately 10 miles southwest of this APE in 1912 but is listed as possibly extirpated.	**Unlikely.** Suitable nesting habitat was absent within this APE and surrounding areas. This species could forage over the ruderal field, but it would be expected to fly away during project activities. The nearest recorded observation of this species within the vicinity was approximately 11 miles southwest of this APE in 1912 but is listed as possibly extirpated.	**Unlikely.** Suitable nesting habitat was absent within this APE and surrounding areas. This species could forage over the ruderal field, but it would be expected to fly away during project activities. The nearest recorded observation of this species within the vicinity was approximately 5 miles northwest of this APE in 1912.
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 (*Asclepias* sp.). Winter roost sites extend along the Pacific coast from northern Mendocino to Baja California, Mexico.	**Unlikely.** Foraging and roosting habitat was absent within this APE. This APE did not contain milkweeds or groves of trees. The CNDDB query resulted in no observations of this species within the regional vicinity of the project.	**Unlikely.** Foraging and roosting habitat was absent within this APE. This APE did not contain milkweeds or groves of trees. The CNDDB query resulted in no observations of this species within the regional vicinity of the project.	**Unlikely.** Foraging and roosting habitat was absent within this APE. This APE did not contain milkweeds or groves of trees. The CNDDB query resulted in no observations of this species within the regional vicinity of the project.
Northern California legless lizard	CSSC	Found primarily underground, burrowing in loose, sandy soil. Forages in loose soil and leaf	**Unlikely.** While loose soils were present within this APE, appropriate leaf litter and	**Unlikely.** While loose soils were present within this APE, appropriate leaf litter and	**Unlikely.** While loose soils were present within this APE, appropriate leaf litter and

Species	Status*	Habitat	Occurrence within the APEs		
			Krum Basin	Laub Basin	Crossland Basin
(*Anniella pulchra*)		litter during the day. Occasionally observed on the surface at dusk and night.	vegetation was absent from this APE and frequent disturbances due to past agricultural use make it unlikely for this species to occur within this APE. The nearest recorded observation of this species within the vicinity was approximately 2 miles east of this APE in 1898.	vegetation was absent from this APE and frequent disturbances due to past and current agricultural use make it unlikely for this species to occur within this APE. The nearest recorded observation of this species within the vicinity was approximately 10.5 miles north of this APE in 1898.	vegetation was absent from this APE and frequent disturbances due to past agricultural use make it unlikely for this species to occur within this APE. The nearest recorded observation of this species within the vicinity was approximately 5 miles northwest of this APE in 1880s.
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.** This species could forage over the field or roost in the underground concrete structure located within this APE. The nearest recorded observation of this species within the vicinity was approximately 6.5 miles east of this APE in 1909.	**Unlikely.** Suitable roosting habitat was absent within this APE and surrounding areas. This species could forage in or fly over this APE but would not be expected to roost within this APE or surrounding areas. The nearest recorded observation of this species within the vicinity was approximately 7.5 miles north of this APE in 1909.	**Unlikely.** Suitable roosting habitat was absent within this APE and surrounding areas. This species could forage in or fly over this APE but would not be expected to roost within the APE or surrounding areas. The nearest recorded observation of this species within the vicinity was approximately 7 miles northwest of this APE in 1909.
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.	**Possible.** This species could den within the canal banks, or the ruderal habitat in this APE. California ground squirrel burrows were present throughout this APE and could be utilized by this species. This species could also use the canals as a wildlife movement corridor. The nearest recorded observation of this species within the vicinity was approximately 5 miles north of this APE in 1993.	**Possible.** This species could den within the canal banks, or the ruderal habitat in this APE. This species could also use the canals as a wildlife movement corridor. The nearest recorded observation of this species within the vicinity was approximately 10.5 miles southwest of this APE in 1975.	**Possible.** This species could den within the dirt canal banks, or the ruderal habitat or use the canals as a wildlife movement corridor. Cement pipes that could be used as atypical dens were observed within this APE. The nearest recorded observation of this species within the vicinity was approximately 4 miles southeast of this APE in the 1980's.
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	**Possible.** Suitable nesting habitat was absent within this APE. This species could forage in the field or nest in the large eucalyptus trees on the	**Possible.** Suitable nesting habitat was absent within this APE. This species could forage in the field or nest in the large eucalyptus trees in the	**Possible.** Suitable nesting habitat was absent within this APE. This species could forage in the field or nest in large trees in the surrounding areas. The

Species	Status*	Habitat	Occurrence within the APEs		
			Krum Basin	Laub Basin	Crossland Basin
		supporting rodent populations.	adjacent property to the north. The nearest recorded observation of this species within the vicinity was approximately 9 miles southeast of this APE in 2016.	surrounding areas. The nearest recorded observation of this species within the vicinity was approximately 5.5 miles northeast of this APE in 2016.	nearest recorded observation of this species within the vicinity was approximately 7 miles southwest of this APE in 2016.
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.	**Unlikely.** Suitable nesting habitat was absent within this APE and surrounding areas. This species could forage in the field or fly over this APE but would not be expected to nest within this APE or surrounding areas. The nearest recorded observation of this species within the vicinity was approximately 8.5 miles northeast of this APE in 1975.	**Unlikely.** Suitable nesting habitat was absent within this APE and surrounding areas. This species could forage in the field or fly over this APE but would not be expected to nest within this APE or surrounding areas. The nearest recorded observation of this species within the vicinity was approximately 11.5 miles north of this APE in 1975.	**Unlikely.** Suitable nesting habitat was absent within this APE and surrounding areas. This species could forage in the field or fly over this APE but would not be expected to nest within this APE or surrounding areas. The nearest recorded observation of this species within the vicinity was approximately 6.5 miles northeast of this APE in 2014.
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.** Elderberry shrubs were absent within this APE and surrounding areas and this APE is not located within the Fresno County populations.	**Absent.** Elderberry shrubs were absent within this APE and surrounding areas and this APE is not located within the Fresno County populations.	**Absent.** Elderberry shrubs were absent within this APE and surrounding areas and this APE is not located within the Fresno County populations.
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.	**Absent.** Vernal, seasonal, and basalt depression pools were absent within this APE and surrounding areas.	**Absent.** Vernal, seasonal, and basalt depression pools were absent within this APE and surrounding areas.	**Absent.** Vernal, seasonal, and basalt depression pools were absent within this APE and surrounding areas.
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	**Possible.** This species could forage over the field or roost in the underground concrete structure located within this APE. The nearest recorded observation of this species within the vicinity was	**Unlikely.** Suitable roosting habitat was absent within this APE and surrounding areas. This species could forage in or fly over this APE but would not be expected to roost within this APE or surrounding areas. The nearest recorded observation of	**Unlikely.** Suitable roosting habitat was absent within this APE and surrounding areas. This species could forage in or fly over this APE but would not be expected to roost within this APE or surrounding areas. The nearest recorded observation of

Species	Status*	Habitat	Occurrence within the APEs		
			Krum Basin	Laub Basin	Crossland Basin
		commonly in crevices in cliff faces but may also use high buildings and tunnels.	approximately 2 miles northeast of this APE in 1991.	this species within the vicinity was approximately 2.5 miles east of this APE in 1958.	this species within the vicinity was approximately 6.5 miles west of this APE in 1991.
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.	**Unlikely.** While canals were present within this APE, basking and nesting habitat was absent within this APE and surrounding areas. The nearest recorded observation of this species within the vicinity was approximately 14 miles northeast of this APE in 2016.	**Unlikely.** While canals were present within this APE, basking and nesting habitat was absent within this APE and surrounding areas. The nearest recorded observation of this species within the vicinity was approximately 16.5 miles northeast of this APE in 2016.	**Unlikely.** While canals were present within this APE, basking and nesting habitat was absent within this APE and surrounding areas. The nearest recorded observation of this species within the vicinity was approximately 9 miles north of this APE in 2016.
Western spadefoot (*Spea hammondii*)	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 canals were present within this APE aquatic vegetation was absent and frequent disturbances due to past agricultural use make it unlikely for this species to occur within this APE. The nearest recorded observation of this species within the vicinity was approximately 9 miles northeast of this APE in 2019.	**Unlikely.** While canals were present within this APE aquatic vegetation was absent and frequent disturbances due to past and current agricultural use make it unlikely for this species to occur within this APE. The nearest recorded observation of this species within the vicinity was approximately 14 miles north of this APE in 2019.	**Unlikely.** While a dirt canal was present within this APE, aquatic vegetation was absent and frequent disturbances due to past agricultural use make it unlikely for this species to occur within this APE. The nearest recorded observation of this species within the vicinity was approximately 9 miles northeast of this APE in 2006.
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	**Absent.** Suitable nesting habitat was absent within this APE and surrounding areas. The nearest recorded observation of this species within the vicinity was listed as extirpated.	**Absent.** Suitable nesting habitat was absent within this APE and surrounding areas. The nearest recorded observation of this species within the vicinity was listed as extirpated.	**Absent.** Suitable nesting habitat was absent within this APE and surrounding areas. The nearest recorded observation of this species within the vicinity was listed as extirpated.

Species	Status*	Habitat	Occurrence within the APEs		
			Krum Basin	Laub Basin	Crossland Basin
		the California breeding population to small numbers of birds.			

***EXPLANATION OF OCCURRENCE DESIGNATIONS AND STATUS CODES**

Present:	Species observed on the APEs at time of field surveys or during recent past.
Likely:	Species not observed on the APEs, but it may reasonably be expected to occur there on a regular basis.
Possible:	Species not observed on the APEs, but it could occur there from time to time.
Unlikely:	Species not observed on the APEs, and would not be expected to occur there except, perhaps, as a transient.
Absent:	Species not observed on the APEs 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)
FC	Federal Candidate	CT	California Threatened
FPT	Federally Threatened (Proposed)	CFP	California Fully Protected
		CSSC	California Species of Special Concern

CALIFORNIA NATIVE PLANT SOCIETY (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. A list of special status animal and plant species with the potential to occur onsite and/or in the vicinity can be found in Table 4-11 and Table 4-12. The Biological Evaluation discusses these special status animal and plant species and their occurrences in detail in or near each of the basin sites. Species protected by California Fish and Game Code, CDFW, USFWS, CEQA, or the National Environmental Policy Act that have the potential to be impacted by project activities include: Sanford's arrowhead, American badger, burrowing owl, pallid bat, San Joaquin kit fox, Swainson's hawk, and western mastiff bat. Mitigation measures BIO-1 through BIO-25, which are outlined below in Section 4.4.3 will ensure impacts to these species are reduced to less than significant.

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?

No Impact. There are no CNDDB-designated "natural communities of special concern" recorded within the APEs or surrounding lands. Riparian habitat is absent from the APEs and adjacent lands. Mitigation measures are not warranted and there would be no impact.

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. Typical wetlands, vernal pools, and other waters were not observed onsite at the time of the biological survey. The only aquatic feature on each APE are canals and a small ditch on the Krum Basin APE. These canals and ditch do not have a connection to navigable waters or a natural drainage channel with a bed or bank, and therefore it can be reasonably assumed that jurisdictional waters are absent.

Since construction would involve ground disturbance over an area greater than one acre, the Project would also be required to obtain a Construction General Permit under the Construction Storm Water Program administered by the Regional Water Quality Control Board. A prerequisite for this permit is the development of a Storm Water Pollution Prevention Plan (SWPPP) to ensure construction activities do not adversely affect water quality. Mitigation is not warranted, and impacts would be less than significant.

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 with Mitigation Incorporated. All APEs contain canal/ditch habitat. Canals/ditches can function as wildlife movement corridors through highly disturbed areas within the San Joaquin Valley and they can be important resources for various species. Anthropogenic activities would deter wildlife from using these corridors during the day, though these deterrents would likely be absent at night. The Krum Basin APE has a suitable feature (i.e., underground concrete structure) that could be used by maternity roosting bats, which would be considered a native wildlife nursery site. The potential impacts to maternity roosting bats have been addressed in Mitigation Measure **BIO-6a** through **BIO-6e** and are listed below in Section 4.4.3. It is unlikely other native species would utilize any other features of the Krum Basin APE or the other two APEs as a wildlife nursery site. Additional mitigation measures are not warranted.

Additionally, implementation of Mitigation Measures **BIO-25** through **BIO-27** will reduce potential impacts to wildlife movement corridors to a less than significant level.

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 Fresno County General Plan. There are no known Habitat Conservation Plans (HCPs) or Natural Communities Conservation Plans (NCCPs) in the Project vicinity. Mitigation measures are not warranted and 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. Mitigation measures are not warranted and there would be no impact.

4.4.3 Mitigation

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 APEs. 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 APEs, 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 (*BMPs*): The project proponent will ensure that all workers employ the following best management practices (BMPs) in order to avoid and minimize potential impacts to special status species:

- All open structures within the APEs must be filled, covered, or removed from the APEs. Prior to filling, covering, or removing the structures, they must be inspected by a biologist.
- Vehicles will observe a 15-mph speed limit while on unpaved access routes.
- Workers will inspect areas beneath parked vehicles, equipment, and materials prior to mobilization. If special status species are detected, the individual will either be allowed to leave of its own volition or will be captured by the qualified biologist (must possess appropriate collecting/handling permits) and relocated out of harm's way to the nearest suitable habitat beyond the influence of the project work area. "Take" of a state or federal special status (rare, California Species of Special Concern, threatened, or endangered) species is prohibited.
- 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.

Project-Related Impacts to Special Status Plant Species

BIO-3 **(*Timing*):** The project should conduct activities in the canal/ditch habitat when they are dry.

BIO-4 **(*Pre-Construction Survey*):** Should project activities be required when the canal/ditch habitat is inundated a qualified botanist/biologist will conduct focused botanical surveys within the canal/ditch habitat during the Sanford's arrowhead blooming season (May-October), 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 and prior to the start of construction.

BIO-5 **(*Avoidance*):** If Sanford's arrowhead individuals are identified during a survey, an avoidance buffer and, if necessary, use of exclusion fencing, will be placed around the area so as not to disturb the plants or its root system.

BIO-6 **(*Formal Consultation*):** If Sanford's arrowhead individuals or populations or sensitive natural communities are detected within project work areas during the focused botanical survey(s), and the plants cannot be avoided, the project proponent will have a qualified biologist write a relocation plan in consultation with CNPS.

Project-Related Mortality and/or Disturbance to American Badger

BIO-7 **(*Pre-construction Take Avoidance Survey*):** A qualified biologist will conduct a pre-construction survey of each APE within seven (7) days prior to vegetation clearing or ground disturbing activities. The goal of this survey is to search for potentially active badger dens.

BIO-8 **(*Remote Cameras*):** If potential dens for American badger are detected during the pre-construction surveys, each potential den will be monitored with remote cameras for a period of three consecutive nights. If there is no activity at the den location recorded for three consecutive nights, the den can be deemed "inactive" or "unoccupied" and closed or excavated.

BIO-9 (*Den Avoidance*): If an American badger is denning on or within 50 feet of any APE, the project proponent shall avoid the den by a minimum 50-foot buffer.

BIO-10 (*Eviction and Den Excavation*): If an American badger is denning on or within 50 feet of any APE and it cannot be avoided, the badger may be evicted, and the den excavated outside of the natal season (generally March 15 – June 15) or if it is determined that there are no cubs in the den. Prior to the planned eviction and den excavation a remote camera will be placed at the den entrance for a minimum of three consecutive nights to record the general time when the badger leaves the den. If it is outside of the natal season or it is determined by a qualified biologist that there are no cubs present in the den the badger will be evicted from the den and the den excavated by hand, with the assistance of machinery, after it has left the den for that night. Should any cubs be discovered during the excavation the work will stop and the crew will leave the site immediately so the female can rescue her cubs and relocate them.

Project-Related Mortality and/or Disturbance to Burrowing Owl

BIO-11 (*Pre-construction Take Avoidance Survey*): Within seven (7) days prior to the start of construction activities a qualified biologist will conduct a pre-construction take avoidance survey for Burrowing Owl (BUOW) and suitable burrows at each APE in accordance with CDFW's *Staff Report on Burrowing Owl Mitigation* (2012). The surveys shall include the APEs and surrounding lands up to 500 feet. If no BUOW individuals or active burrows are observed, no further mitigation is required.

BIO-12 (*Avoidance*): If an active BUOW burrow is detected avoidance buffers shall be implemented. 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 burrow(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 and all BUOW have left the APE.

BIO-13 (*Passive Relocation*): If avoidance of an active BUOW burrow is not feasible, passive relocation may be completed during the non-breeding season (September 1 through January 31) or during the breeding season (February 1 through August 31) if a qualified biologist determines that there are no young in the burrow. Prior to completion a qualified biologist will prepare a passive relocation plan that would detail the methods to be used. It would include the tools to exclude the BUOW from its burrow (i.e., one-way doors or other devices) and excavate the burrow (hand tools and machinery, if needed). Following completion of passive relocation, a report will be prepared that documents the methods and results of these efforts.

Project-Related Mortality and/or Nest Abandonment of Migratory Birds, Raptors, and Special Status Birds Including Swainsons Hawk

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 pre-construction take avoidance survey for Swainson's hawk nests onsite and within a 0.5-mile radius within seven (7) calendar days prior to the start of construction at all APEs. 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. The survey would also include inspecting for nesting migratory birds within and up to 50 feet outside of each APE and for other nesting raptors within up to 450 feet outside of each APE. 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.

Project-Related Mortality and/or Disturbance of Maternity Roosting Bats and Special Status Bats Including Pallid Bat and Western Mastiff Bat

BIO-17 (*Overwintering Season Avoidance*): Project activities will avoid the concrete structure by at least 150 feet during the overwintering season (December 1 through February 28). Lighting is not to be used near the structure where it would shine on or into a potential roost entrance. Combustion equipment, such as generators, pumps, and vehicles are not to be parked, operated, over or adjacent to the structure.

BIO-18 (*Pre-Construction Survey*): From March 1 through November 31, a pre-construction guano and emergence survey will be performed prior to disturbing, closing, or removing the underground structure or working within 150 feet of the structure to identify if there are bats roosting in the structure. A qualified biologist will conduct the survey 2 days or less prior to working on or around the structure.

BIO-19 (*Maternity Season Avoidance*): Should an active maternity roost be identified during the pre-construction survey; project activities shall avoid working within 150 feet of the roost until a qualified biologist has determined that the young have been fully reared. Lighting is not to be used near maternity 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, over or adjacent to the maternity roost.

BIO-20 (*Eviction*): Should a pallid bat or western mastiff bat roost be observed when the roost is not being used as a maternity or overwintering roost, the bats may be evicted. Prior to completion a qualified biologist will prepare an eviction plan that would detail the methods to be used. It would include the tools to evict the bats from the structure (i.e., one-way doors or other devices) and safely dismantle the roost. Following completion of eviction, a report will be prepared that documents the methods and results of these efforts.

BIO-21 (*Deterrence*): If construction is paused for two days or more while removing the underground structure, a qualified biologist will determine what can be used to deter bats from using the structure as a roosting site between construction activities.

Project-Related Mortality and/or Disturbance To San Joaquin Kit Fox

BIO-22 (*Pre-Construction Survey*): Within seven (7) days prior to the start of construction a pre-construction survey for SJKF will be conducted on and within 200 feet of each APE.

BIO-23 (*Establish Buffers*): On discovery of any SJKF dens near any APE a qualified biologist will determine appropriate construction setback distances (buffer zones) based on applicable USFWS guidelines (see below). If needed, construction buffers will be identified with flagging, fencing, or other easily visible means. They will be maintained until the biologist has determined that the den will no longer be impacted by construction or the SJKF has left.

1. At least 100 feet around den(s);
2. At least 200 feet around natal dens (which SJKF young are reared); and
3. At least 500 feet around any natal dens with pups (except for any portions of the buffer zone that is already fully developed).

BIO-24 (*Avoidance and Minimization*): The project will observe all avoidance and minimization measures during construction and on-going operational activities identified in the USFWS's *Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance* (2011), including, but not limited to: maintaining buffer zones and construction speed limits; covering pipes; installing escape structures; restriction of herbicide and rodenticide use; proper disposal of food items and trash; prohibition of pets and firearms; and completion of an employee education program (see BIO-1).

Project-Related Impacts to Wildlife Movement Corridors and Native Wildlife Nursery Sites

BIO-25 (*Operational Hours*): The project's construction activities will occur in the canal/ditch habitat, if feasible, between a half hour after sunrise and a half hour before sunset (i.e., day-time hours) to avoid impacts on wildlife movement corridors.

BIO-26 (*Wildlife Access*): Should construction activities in the canal/ditch habitat occur between a half hour before sunset and a half hour after sunrise (i.e., night-time hours) each canal/ditch will not be blocked, if feasible, during night-time hours. If construction must block one or both sides of the canal/ditch habitat during night-time hours, an alternative route through the construction area to allow wildlife to move through the area shall be identified by a qualified biologist and maintained throughout the construction schedule timeframe in the canal/ditch habitat.

BIO-27 (*Covers and Inspections*): Project pipes, culverts, siphons, excavations, and vertical pipes along the canal/ditch habitat will be covered each night to prevent wildlife from falling in or entering and becoming trapped or injured during migratory or dispersal movements. All pipelines, culverts, siphons, excavations, and vertical pipes along the canal/ditch habitat will be inspected for trapped wildlife before moving, burying, or capping.

4.5 CULTURAL RESOURCES

Table 4-13: 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 prehistory of Indigenous cultures that had occupied the Fresno County area are known to have included many native American tribes that include, but are not limited to, the Mono, Yokut, Chukchansi, Choinumi, Wachumni, and Wahtokes. Near the turn of the 20th century, the U.S. government created rancherias and local tribes have positioned themselves in and near these newly-created rancherias since. Fresno County contains three rancherias which include Big Sandy, Table Mountain, and Cold Springs.[9]

Pedestrian Survey

A Class III/Phase I Survey for the Project was prepared for the Project in March 2024 (see Appendix C). At the time of the Class III Inventory/ Phase I survey, the study area consisted of flat agricultural land containing row crops, orchards, irrigation delivery systems, rural County roads, and other typical rural/agricultural infrastructure.

Records Search

A records search from the Southern San Joaquin Valley Information Center (SSJVIC) of the California Historical Resources Information System (CHRIS), located at California State University, Bakersfield was conducted in December 2023. The records search includes a review of all recorded archaeological and built-environment resources as well as a review of cultural resource reports on file. In addition, the California Points of Historical Interest, the California Historical Landmarks, the California Register of Historical Resources, the National Register of Historic Places, and the California State Built Environment Resources Directory listings were reviewed for the above referenced APE and an additional ½-mile radius. The search confirmed there have been three previous cultural resource studies conducted within the Project area and there have been five previous cultural resource studies conducted within the one-half mile radius. The search also identified six cultural resources within the Project APE and three within a one-half mile radius of the Project APE. Due to the sensitive nature of cultural resources, archaeological site locations are not released. (Appendix C)

[9] (General Plan Consultant Team and Fresno County Staff 2000)

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?

a and b) Less than Significant Impact with Mitigation Incorporated. A CHRIS records search, from the SSJVIC, was conducted in December 2023. The search confirmed there have been three previous cultural resource studies conducted within the Project area and there have been five previous cultural resource studies conducted within the one-half mile radius. The search also identified six cultural resources within the Project APE and three within a one-half mile radius of the Project APE. It is unlikely that the Project has the potential to result in significant impacts or adverse effects to cultural or historical resources, such as archaeological remains, artifacts, or historic properties. However, in the improbable event that cultural resources are encountered during Project construction, implementation of mitigation measure **CUL-1** outlined below would 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. There is no evidence or record that the Project has the potential to be an unknown burial site, or the site of buried human remains. In the unlikely event of such a discovery, mitigation shall be implemented. With incorporation of mitigation measure **CUL-2** outlined below, impacts resulting from the discovery of remains interred on the Project site would be less than significant.

4.5.3 Mitigation

CUL-1 Should archaeological 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 In the event that human remains are discovered on the Project site, the Fresno 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

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4.6 ENERGY

Table 4-14: 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

Pacific Gas and Electric (PG&E) supplies electricity and natural gas to the Project areas. PG&E obtains its power through hydroelectric, thermal (natural gas), wind, and solar generation of purchases. PG&E continually produces new electric generation and natural gas sources and implements continuous improvements to gas lines throughout its service areas to ensure the provision of services to residents. New construction would be subject to Titles 20 and 24 of the CCR which each serve to reduce demand for electrical energy by implementing energy-efficient standards for residential, as well as non-residential buildings. As the Project does not involve buildings of any kind, these regulations are not applicable.

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

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 during construction or operation. All improvements would utilize existing PG&E lines and no new services would be needed. The recovery well and propellor flow meter would require power from PGE, but nothing in addition to the existing lines. The Project would comply with construction best management practices and may be required to complete a SWPPP as part of construction. Once completed, the Project would be mostly passive in nature and would not use an excessive amount of energy. Therefore, the Project would not result in potentially significant environmental impacts due to wasteful, inefficient, or unnecessary consumption of energy resources during construction or operation. The 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. The Project would be passive in nature once it is completed, and the construction phase would be temporary, lasting six months per basin site and would not exceed any thresholds set by the SJVAPCD. All improvements would utilize existing PG&E lines and no new services would be needed. There would be no impacts to state or local plans.

4.7 GEOLOGY AND SOILS

Table 4-15: 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 waste water disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geological feature?	☐	☐	☐	☒

4.7.1 Baseline Conditions

Geology and Soils

The Project is located in Fresno 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. 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 uplifted

Sierra Nevada Range.[10] 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.

The soils present and their characteristics at each of the basin locations can be found in Table 4-16.

Table 4-16. List of Soils Located on the APEs and Their Basic Properties

APE Basin Name(s)	Soil	Soil Map Unit	Percent of APE	Hydric Soil Category	Drainage	Permeability	Runoff
Krum Basin	*Exeter*	Sandy loam	8.7%	Predominantly Nonhydric	Well drained	Moderately slow	Medium
Krum Basin	*Greenfield*	Sandy loam, 0 to 3 percent slopes	18.5%	Nonhydric	Well drained	Moderately rapid	Very low
Krum Basin	*Madera*	Loam	12.6%,	Predominantly Nonhydric	Moderately well drained	Very slow	Medium
Krum Basin	*Madera*	Clay loam	40.2%	Predominantly Nonhydric	Moderately well drained	Very slow	Medium
Krum Basin	*Ramona*	Loam	0.1%	Nonhydric	Well drained	Moderately slow	Low
Krum Basin	*San Joaquin*	Loam, 0 to 3 precent slopes	20.0%	Predominantly Nonhydric	Moderately well drained	Very slow	High
Crossland Basin	*San Joaquin*	Sandy loam, 0 to 3 percent slopes, MLRA 17	50.6%	Predominantly Nonhydric	Well and moderately well drained	Very slow	Very high
Laub Basin	*Hesperia*	Hesperia fine sandy loam	90.3%	Nonhydric	Well drained	Moderately rapid	Negligible
Laub Basin	*Hesperia*	Very deep, saline-sodic	9.7%	Nonhydric	Well drained	Moderately rapid	Low

[10] Harden, D.R. 1998, California Geology, Prentice Hall, 479 pages

APE Basin Name(s)	Soil	Soil Map Unit	Percent of APE	Hydric Soil Category	Drainage	Permeability	Runoff
Crossland Basin	*Atwater*	Loam, moderately deep, 0 to 3 precent slopes	49.4%	Nonhydric	Well drained	Moderately rapid	Very low

Hydric soils are defined as soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions such that under sufficiently wet conditions, hydrophytic vegetation can be supported. Soils at the Krum Basin APE are considered nonhydric or predominantly nonhydric. Soils at the Laub Basin APE are considered nonhydric. Soils at the Crossland Basin are considered nonhydric or predominantly nonhydric.

Faults and Seismicity

The Project sites are not located within the Alquist-Priolo Earthquake Fault Zone and no known faults cut through the local soil at any of the site. The nearest mapped principal fault is the San Andreas Fault, located approximately 60 miles southwest of the nearest proposed basin site, the Krum Basin.[11] 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 Ortigalita fault system is located over 56 miles west of the proposed Krum Basin.[12]

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 the western portion of Fresno County, liquefaction hazards would be negligible.

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 sites are dominated by loam and sandy loam soils, with a low to moderate risk of subsidence.

Dam and Levee Failure

The Project is not located in an area that would be susceptible to dam and levee failure impacts.

Paleontological Resources

Paleontological resources are fossilized remains of flora and fauna and associated deposits. CEQA requires that a determination be made as to whether a project would directly or indirectly destroy a unique

[11] (California Department of Conservation 2023)
[12] Ibid.

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.

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?

a-i and a-ii) Less than Significant Impact. Ground shaking intensity is largely a function of distance from the earthquake epicenter and underlying geology. The most common impact associated with strong ground shaking is damage to structures and no habitable structures are associated with the Project. The Project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving the 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. No known faults with evidence of historic activity cut through the valley soils in the Project sites' area. Due to the geology of the Project area and its distance from active faults, the potential for loss of life, property damage, ground settlement, or liquefaction to occur in the Project area is considered minimal.

According to the Alquist-Priolo Earthquake Fault Zoning Map the nearest known fault of any kind is the Ortigalita Fault located approximately 56-miles west of the nearest proposed basin site, the Krum Basin. The nearest major active fault, the San Andreas Fault – creeping section, is located approximately 60 miles southwest of the Krum Basin. The Project would not include habitable residential, agricultural, commercial, or industrial structures. Operation of the Project would require infrequent, as-needed, routine maintenance trips to the sites. Any impacts would be less than significant.

iii. Seismic-related ground failure, including liquefaction?

Less than Significant 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 floors 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 is not in a wetland area and is located in the middle portion of the County where liquefaction risk is considered low. Additionally, the Project would be in compliance with the relevant land use plans, because of this comprehensive body of construction requirements enforced by the County, and the goals and policies set forth in the Fresno County General Plan that would avoid or reduce the effects of these hazards, this impact would be less than significant.

iv. Landslides?

No Impact. As the Project is located on the Valley floor, no major geologic landforms exist on or near the Project sites 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. Earthmoving activities associated with the Project would include excavation, trenching, and infrastructure construction. These activities could expose soils to erosion processes and the extent of erosion would vary depending on slope steepness/stability, vegetation/cover, concentration of runoff, and weather conditions. Dischargers whose projects disturb one (1) or more acres of soil or whose projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity Construction General Permit Order 2009-0009-DWQ. Construction activity subject to this permit includes clearing, grading and disturbances to the ground such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The Construction General Permit requires the development of a SWPPP by a certified Qualified SWPPP Developer. Since the Project sites have relatively flat terrain with a low potential for soil erosion and would comply with the SWRCB requirements, the impacts 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?

Less than Significant Impact. The Project sites and the immediate surrounding areas do not have any substantial grade changes in the topography to the point where the proposed basins would expose people or structures to potential substantial adverse effects on, or offsite, such as landslides, lateral spreading, subsidence, liquefaction or collapse. Any impacts would be less than significant.

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?

Less than Significant Impact. The soils at the Project site include a majority of loam and sandy loam soils (see Table 4-16). These soils are considered well drained and prime soils for agricultural use with moderate to high permeability. The Project would not contain any facilities that could be affected by expansive soils. The Project's would be consistent with the California Building Code; therefore, impacts would be less than significant.

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. Disposal of wastewater is not necessary for the Project, therefore there would be no impact.

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

No Impact. There are no known paleontological resources or unique geological features that have been identified at the Project site, at any of the basin locations. There would be no impacts.

4.8 GREENHOUSE GAS EMISSIONS

Table 4-17: 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 greenhouse gas (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. O_3 is not emitted directly into the atmosphere but is formed by a complex series of chemical reactions between volatile organic compounds, nitrogen oxides, and sunlight.

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

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

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

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

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

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 by at least 40 percent, 150 percent, and 20 percent respectively since the year 1750. GHG emissions are typically expressed in carbon dioxide-equivalents (CO_2e), based on the GHG's Global Warming Potential (GWP). The GWP is dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. For example, one ton of CH_4 has the same contribution to the greenhouse effect as approximately 25 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*[13], 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

Project Related Emissions

Construction of the Project is assumed to be completed over the course of approximately three years, with each of the three basins being constructed within approximately six months, starting each fall from the years 2025-2027. Emissions associated with the Project were calculated using CalEEMod Air Quality Model, Version 2022.1.1.20. The emissions modeling includes emissions generated by off-road equipment, haul

[13] (San Joaquin Valley Air Pollution Control District 2009)

trucks, and worker commute trips. Emissions were quantified based on a worst-case scenario of each basin being developed over the same six-month span, commencing in fall of 2025. All other assumptions are based upon the default parameters contained in the model. Localized air quality impacts associated with the Project would be minor and were qualitatively assessed. Modeling assumptions and output files are included in Appendix A. Estimated construction-generated emissions are summarized in Table 4-18. GHGs impact the environment over time as they increase and contribute to climate change.

Table 4-18: Short Term Construction Related GHG Emissions

	Emissions (MT CO2e) in TPY
Maximum Annual Construction CO2e Emissions	305
AB 32 Consistency Threshold for Land-Use Development Projects*	1,100
AB 32 Consistency Threshold for Stationary Source Projects*	10,000
Threshold Exceeded?	No

* As published in the Bay Area Air Quality Management District's CEQA Air Quality Guidelines. Available online at http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en Accessed 10/26/2023.

Construction related generation of GHGs would be a maximum of 305 Metric Tons of Carbon Dioxide Equivalent (MT CO2e) per year, while operational are expected to be negligible due to the nature of the proposed use. The Project would not exceed the AB 32 consistency threshold for land use projects for both short term construction emissions and long-term operational emissions as a result.

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

Less than Significant Impact. The Project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. As shown in Table 4-18, the Project is not expected to result in the generation of GHG emissions that would exceed the AB 32 consistency threshold of 1,100 MT CO2e annually during both construction activities. Due to the nature of the proposed use, the Project is expected to result in the generation of negligible quantities of emissions during operational activities. Therefore, impacts would be less than significant.

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

No Impact. The Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. The Project would be in compliance with all SJVAPCD policies and regulations and would not exceed an applicable threshold for GHG emissions. Therefore, there would be no impacts.

4.9 HAZARDS AND HAZARDOUS MATERIALS

Table 4-19: 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

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 in March 2024, determined that there are no known active hazardous waste generators or hazardous material spill sites within the Project sites or immediate surrounding vicinity.[14]

Airports

The nearest proposed basin site, the Crossland Basin, is located approximately four miles southeast of the Fresno Yosemite International Airport. The Project site is not located inside an Airport Land Use Compatibility Plan for either of the mentioned airports.

Emergency Response Plan

The Fresno County Office of Emergency Services is located within the Department of Public Health and coordinates planning, preparedness, response and recovery efforts for disasters occurring within the unincorporated area of the County.

Sensitive Receptors

Sensitive Receptors are groups that would be more affected by air, noise, and light pollution, pesticides, and other toxic chemicals than others. This includes infants, children under 16, elderly over 65, athletes, and people with cardiovascular and respiratory diseases. High concentrations of these groups would include daycares, residential areas, hospitals, elder care facilities, schools and parks. The Project sites are located within an agricultural and rural setting, there would not be sensitive receptor areas near the basin sites and proposed pipeline connections.

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?

a) and b) Less than Significant Impact. There are no designated hazardous materials transportation routes in the vicinity of the Project sites. Additionally, there would be no transport, use, or disposal of hazardous materials associated with the construction, with the exception of diesel fuel for construction equipment. Any potential accidental hazardous materials spills during Project construction are the responsibility of the contractor to remediate in accordance with industry best management practices and State and County regulations. Any impacts would therefore be less than significant.

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, with the exception of diesel for construction equipment. The John S. Wash Elementary School, which is the closest school to any of the Project sites, is located

[14] (California Department of Toxic Substances Control 2022); (California State Waterboards 2023)

approximately 1.77 miles northwest of the Crossland Basin site. Any impact would be considered 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 the DTSC. Both the SWRCB's Geotracker and DTSC's EnviroStor websites were checked for contaminated groundwater or sites in the area. 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?

Less than Significant Impact. The Fresno Yosemite International Airport is located approximately four miles away from the closest Project site. The construction of the basins and pipelines 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 provide 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 any existing or future emergency response plans or evacuation plans of the area. There would be no impacts.

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

Less than Significant Impact. The Project sites and the surrounding lands consists of agricultural lands and related infrastructure. The Project would not include any residential components, nor would it require any employees to be stationed permanently at the site on a daily basis. Any impacts from directly or indirectly exposing people or structures to injury or death involving a wildland fire would be considered less than significant.

4.10 HYDROLOGY AND WATER QUALITY

Table 4-20: 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

The Project would result in the construction of approximately 154-acres of recharge basins in rural Fresno County. Neither of the Project sites are located in a flood hazard zone (See Figure 4-2). The Project is located within the NKGSA in the San Joaquin Valley Basin and Kings subbasin.[15] The NKGSA submitted the North Kings GSP in 2020.[16]

[15] (California Department of Water Resources 2022)
[16] (North Kings Groundwater Sustainability Agency 2019)

Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map Panel No. 06019C2085H, 06019C2125H and 06019C2135H (effective 2/18/2008) indicate that the Project areas are not located in a flood hazard zone and have minimal flooding risk.[17]

The nearest surface water to the proposed basin sites are described below:

- Krum Basin: the nearest surface water is Houghton Canal No. 78 which is located adjacent to the south boundary of the APE.
- Laub Basin: the nearest surface water is Central Canal No. 23, which is located along the west boundary of the APE. An unnamed dirt ditch is also located in the center of the APE, flowing west to east.
- Crossland Basin: the nearest surface water is the Hansen Canal No. 129, which is located within the northern portion of the APE.

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. The SWRCB requires a SWPPP be prepared for projects that disturb one (1) or more acres of soil. A SWPPP involves site planning and scheduling, limiting disturbed soil areas, and determining best management practices to minimize the risk of pollution and sediments being discharged from construction sites. Implementation of the SWPPP would minimize the potential for the Project to substantially alter the existing drainage pattern in a manner that would result in substantial erosion or siltation onsite or offsite. Additionally, there would be no discharge to any surface source. However, there would be percolation discharge to groundwater via each proposed recharge basin. Use of chemicals or surfactants would not be generated through the maintenance or operation of the Project and as such, there would be no discharge directly associated with Project implementation that could impact water quality standards. The Project would not violate any water quality standards and would not impact waste discharge requirements. Impacts 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?

Less than Significant Impact. The Project entails the construction of three recharge basins in Fresno County to improve groundwater supplies by capturing storm and flood flows. The recharge volume would be stored and allowed to infiltrate into the underlying soils over a period of time following a storm or flood event. The NKGSA holds jurisdiction over the Project area and is responsible for developing a GSP to minimize significant impacts to lowering groundwater levels and promote aquifer replenishment, as the Project is intended. No additional groundwater would be required compared to baseline conditions; therefore, the impacts would be less than significant.

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:

[17] (United States Federal Emergency Management Agency (FEMA) 2023)

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

Less than Significant Impact. The Project would improve groundwater storage and prevent exceedances of stormwater drainage systems by providing depressional spaces for surface water to be captured and stored for recharge purposes. The Project would not alter the course of the flow of a stream or river in which substantial erosion or siltation could occur. In addition, the Project would not result in an increase in the amount of surface runoff because the scope of this Project does not include the conversion of any permeable surface into impermeable surfaces. Therefore, impacts would be less than significant.

ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;

No Impact. The Project would improve groundwater storage and prevent exceedances of storm water drainage systems or additional polluted runoff by providing a depressional space for surface water at three locations. The volume would be stored and allowed to infiltrate the underlying soils over a period of time after a storm or flood event in an effort to recharge and replenish the underground aquifers. There would be no impact.

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

No Impact. The Project would improve groundwater storage and prevent exceedances of storm water drainage systems or additional polluted runoff by providing a depressional space for surface water at three locations. There would be no impacts.

iv. impede or redirect flood flows?

No Impact. The Project would not impede or redirect flood flows. The Project is designed to capture and temporarily store storm and flood flows and allow the water to infiltrate into the ground over a period of time following an even, thereby facilitating recharge of the underlying aquifer. There would be no impact.

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

Less than Significant Impact. The Project is not located in a flood hazard (see **Figure 4-2**), tsunami, or seiche zone. The Project is in the central San Joaquin Valley, especially isolated from opportunities for tsunami or seiche. There is a very low probability of dam failure as there are no dams within a 10-mile radius of each site. There would be no employees required to be on site on a regular basis at any of the basin locations and no housing would result from Project construction or implementation. The 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?

No Impact. The Project would not conflict with implementation of a water quality control plan. The Project is intended to improve implementation of the GSP as outlined by the NKGSA. As stated in the NKGSA GSP, "Developing more groundwater recharge and banking projects is considered key to stabilizing groundwater levels".[18] The Project would help alleviate water supply issues during the irrigation season and capture any available storm or flood runoff available to recharge the groundwater. Furthermore, construction activities would require implementation of a SWPPP and compliance with all Cal/OSHA regulations in order to reduce the potential for incidental release of pollutants or hazardous substances into surface water or groundwater. There would be no impacts.

4.10.3 Federal Cross-Cutting Topic

Flood Plain Management- Executive Order Numbers 11988, 12148, and 13690

FEMA designates flood hazard and frequency for cities and counties on its Flood Insurance Rate Maps. The proposed project areas are not within a designated 100-year floodplain, on a floodplain map, or otherwise designated by FEMA.

Rivers and Harbors Act

The Rivers and Harbors Act of 1899 prohibits construction of any bridge, dam, dike, or causeway over or in navigable waterways of the U.S., without Congressional approval. Under Section 10 of the Act, the building of any wharfs, piers, jetties, and other structures is prohibited without Congressional approval, and excavation or fill within navigable waters requires the approval of the Chief of Engineers. The USACE is authorized to issue permits for the discharge of refuse matter into or affecting navigable waters under Section 13 of the act.

The proposed project would not be constructed in a location that would affect a navigable waterway, requiring permit or approval by USACE.

Safe Drinking Water Act, Sole Source Aquifer Protection

The Safe Drinking Water Act (SDWA) required USEPA to establish criteria through which an aquifer may be declared a critical aquifer protection area. Since 1977, it has been used by communities to help prevent contamination of groundwater from federally funded projects. These aquifers are defined as "sole source aquifers." EPA's Sole Source Aquifer (SSA) Program was established under Section 1424(e) of the SDWA. These are, essentially, aquifers that are the only drinking water supply for the population of a region.

SSA designation protects an area's groundwater resources by requiring USEPA to review all proposed projects within the designated area that will receive federal financial assistance. The SSA Program states that if USEPA determines an area to have an aquifer which is the sole or principal drinking water source for the area, that if contaminated would create a significant hazard to public health, a notice of that determination needs to be published in the Federal Register. After publication of any such notice, no commitment for federal financial aid may be applied for any project that the Administrator determines may contaminate the aquifer through a recharge zone, so as to create a significant hazard to public health.[19]

Pursuant to Section 1424(e), the USEPA has designated six (6) aquifers in Region IX which are the sole or principal source of drinking water for all municipal and private water systems in that watershed, and that if contaminated, would create a significant hazard to public health.

The Project is located in Fresno County Sole Source Aquifer, ID No. SSA55a on Region IX.

[18] (Provost & Pritchard Consulting Group 2022)
[19] (EPA 2019)

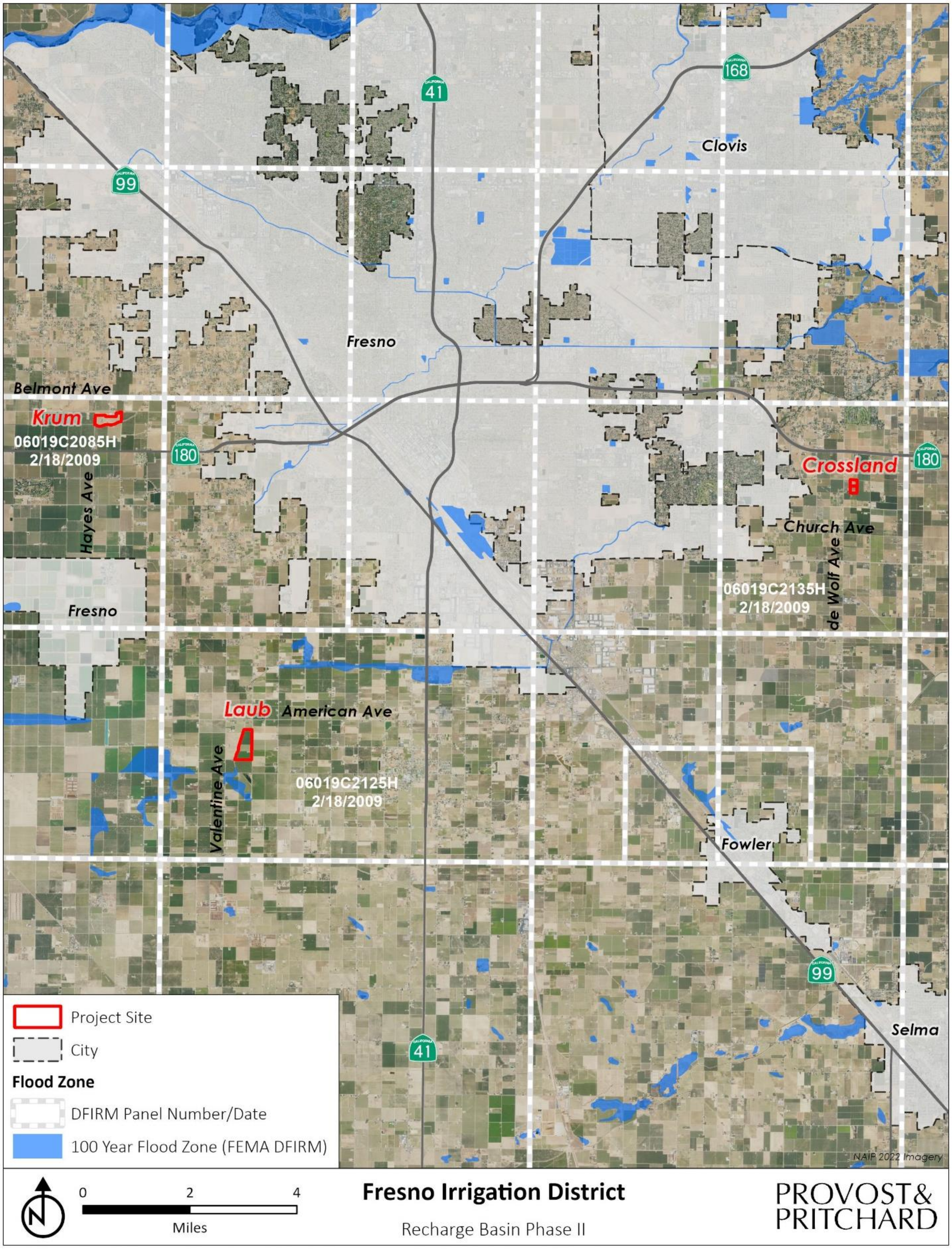

Figure 4-2: FEMA Flood Map

4.11 LAND USE AND PLANNING

Table 4-21: 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 proposed sites for the Project are located within rural Fresno County, an area dominated by agriculture and rural residences. The sites contain approximately 154 acres total of farmland. Land within this part of the County are zoned Exclusive Agriculture by Fresno County.[20] According to the Fresno County General Plan Background Report, the sites are planned for Agriculture.[21]

4.11.2 Impact Analysis

a) Would the project physically divide an established community?

No Impact. The general vicinity of the Project sites consist of farmland and scattered residential and vacant land uses typical to rural areas in the Central Valley. Properties directly surrounding the Project sites are currently in use for agriculture, including vines and tree crops. The Proposed Project would not physically divide any established communities. 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 sites are zoned Exclusive Agricultural. The Project involves the construction and operation of three recharge basins, approximately 154 acres in total, which is consistent with the land uses within the vicinity. The Project would not conflict with any land use plan, policy or regulation adopted. There would be no impact.

4.11.3 Federal Cross-Cutting Topic

Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) was enacted in 1972. This act, administered by the National Oceanic and Atmospheric Administration, provides management of the nation' s coastal resources. The

[20] (Fresno County 2023)
[21] (General Plan Consultant Team and Fresno County Staff 2000)

California coastal zone generally extends 1,000 yards inland from the mean high tide line. The Project site is more than 100 miles from the coastline. Therefore, the proposed Project would not conflict with the CZMA.

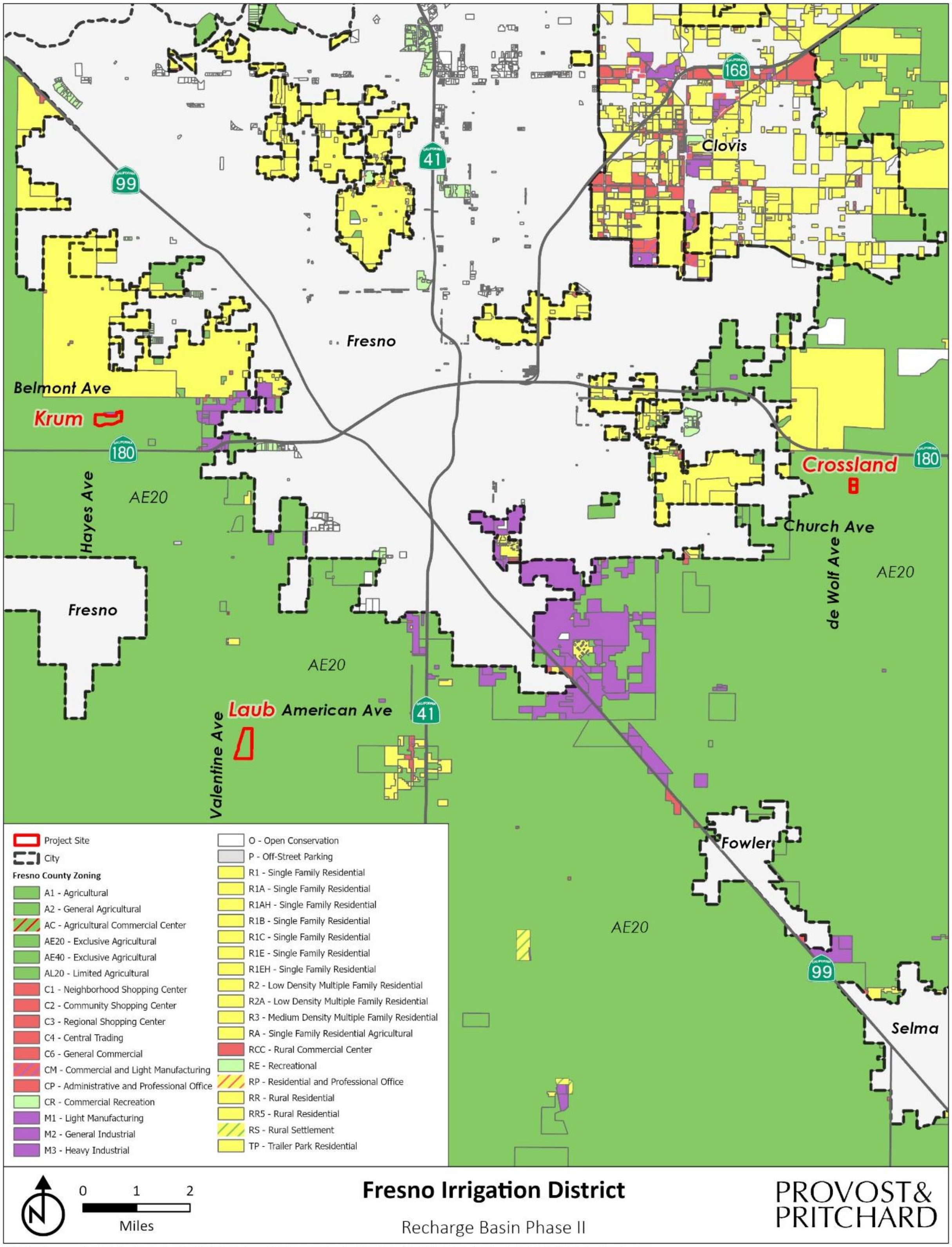

Figure 4-3: Zoning Map

4.12 MINERAL RESOURCES

Table 4-22: 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

According to the California DOC's Mineral Land Classification map, the Project sites are not located in an area identified for aggregate material production.[22] The Fresno County General Plan Background Report identifies sand and gravel resources throughout the County. There are no mineral resource locations located on any of the Project sites. [23]

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?

a) and b) No Impact. The California Geological Survey Division of Mines and Geology has not classified any of the Project sites as a Mineral Resource Zone under the Surface Mining and Reclamation Act. California's Division of Oil, Gas and Geothermal Resources has no records of closed or active oil or gas wells on the Project sites. No known mineral resources are within the Project area. Therefore, construction of the Project would not result in the loss of availability of a known mineral resource since no known mineral resources occur in this area. Operation of the Project would not result in mineral resource impacts. There would be no impacts.

[22] (California Department of Conservation 2015)
[23] (General Plan Consultant Team and Fresno County Staff 2000)

4.13 NOISE

Table 4-23: 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 sites are located in Fresno County, dominated primarily by agricultural production. The Project sites are located in southern Fresno County at the following locations: Krum Basin near the intersection of N. Hayes Avenue and W. McKenzie Avenue, Laub Basin near the intersection of S. Marks Avenue and W. American Avenue, and the Crossland Basin near the intersection of De Wolf Avenue and East Butler Avenue. The Project vicinity is dominated by agricultural uses, sparse rural residential and farmland uses. The Fresno-Yosemite International Airport is located approximately four miles southeast of the proposed Crossland Basin site and the Fresno Chandler Executive Airport is located approximately 3.6 miles northwest of the proposed Krum Basin site.

Fresno County Noise Control Ordinance[24]: Chapter 8.40 of the Fresno County Municipal Code contains the Noise Control Ordinance, which places limits on noise levels and hours of construction. Section 8.40.060 states that noise sources associated with construction activities are exempt from the provisions of the Noise Control Ordinance, as long as construction does not take place before 6:00 a.m. or after 9:00 p.m. on any day except Saturday or Sunday, or before 7:00 a.m. or after 5:00 p.m. on Saturday or Sunday.

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?

[24] (Fresno County California Code of Ordinances 1978)

Less than Significant Impact. The construction phase of the Project would involve temporary noise sources, predominately from off-road equipment, such as excavators, backhoe/loader, drilling rigs, concrete truck, and concrete pumper for approximately six months at each basin site. The Project is located adjacent to agricultural lands, accustomed to noises associated with farm equipment. The Project would comply with the Fresno County Noise Control Ordinance. Operational maintenance activities would be on an as-needed basis with routine monitoring performed by existing staff and would not generate significant new noise. Any impacts would be mild and temporary and therefore, less than significant.

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

Less than Significant Impact. The construction phase of the Project would primarily consist of excavation and grading as part of development of the new basins. The Project sites are located in an area dominated by agricultural production. Agricultural production commonly includes the use of off-road equipment and ground-disturbing activities regularly. During construction, Project-related construction activities would not vary substantially from the baseline conditions routinely experienced on neighboring properties. Therefore, implementation of the Project would result in less than significant impacts.

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 is not located within an airport land use plan of an airport. The Fresno Yosemite International Airport is located approximately four miles southeast of the nearest Project site, while the Fresno Chandler Executive Airport is approximately more than 3.6-miles northeast of the nearest Project site. The Project would not include the development of habitable structures or require the presence of permanent staff onsite. There would be no impact.

4.14 POPULATION AND HOUSING

Table 4-24: 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

Fresno County's population as of July 2022 Census data is estimated to be 1,015,190 with a percent population change from 2020 to 2022 of 0.6 percent. As of 2022 there is an estimated 345,493 housing units with an average of 3.14 persons per household.[25]

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?

a) and b) No Impact. The goal of the Project is not to induce population growth. The Project would be to construct three new recharge basins in an effort to capture and use stormwater and flood flows. The Project would not encourage population growth directly or indirectly. No residential structures would be built or removed as part of the Project. Therefore, there would be no impact.

4.14.3 Federal Cross-Cutting Topic

Environmental Justice Executive Order 12898

Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, was issued in 1994. The EO directs federal agencies to identify and address the disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations, to the greatest extent practicable and permitted by law.

[25] (United States Census Bureau - Fresno County 2023)

USEPA has developed a mapping and screening tool called EJSCREEN that uses nationally consistent data to identify minority or low-income communities. According to EJSCREEN, the proposed project site is not in an environmental justice community (US EPA 2015). In addition, the purpose of the project would be to supply clean, reliable water to residents of the District. Because the proposed project would directly benefit the local community only, no disproportional health or environmental effect would be imposed on minority or low-income populations. The proposed project would not conflict with the purpose and objectives of EO 12898.

4.15 PUBLIC SERVICES

Table 4-25: 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:	☐	☐	☐	☒
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

4.15.1 Baseline Conditions

Fire Protection: Due to the Project's multiple locations, the Project would be served by both the North Central Fire Protection District (NCFPD) and the Fresno County Fire Protect District (FCFPD). Both Districts serve areas of unincorporated Fresno County. The closest FCFPD station is Fire Station 19, located approximately 2.2 miles east of the Krum Basin site. The closest NCFPD fire station is Station 56 located approximately 2.5 miles northwest of the Krum Basin site.

Police Protection: According to the County of Fresno's General Plan, the Fresno County Sherriff's Department serves the Project area. The nearest Fresno County Sheriff Station is located approximately 5.6 miles southeast of the Crossland Basin site. The unincorporated portions of the County are served by 329 sworn officers for a ratio of 1.09 officers per 1,000 residents. The number of patrol officers is anticipated to increase with 28 additional officers to accommodate projected population growth[26].

Schools: Public school services are provided throughout the County by 35 school districts. Of the 35 school districts, 16 are unified districts and 19 districts consist of 16 elementary school districts and three high school districts; many of which have one or two schools[27]. The closest high school is Central High School, located approximately 4 miles west of the Crossland Basin site. The John S. Wash Elementary School is located approximately 1.77 miles northwest of the Crossland Basin site.

Parks: Fresno County has several regional parks, as well as State and national parks, national forest, wilderness areas and ecological reserves. The development and maintenance of regional parks and

[26] (Fresno County 2000)
[27] Ibid.

landscaped areas is held responsible by the Fresno County Parks Division. The nearest park is the Kearney Park, located approximately 1.25-miles southwest of the proposed Laub Basin site.

Landfills: The nearest landfill to the Project site is the American Avenue Landfill located over 14-miles southwest of the proposed Krum Basin site

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:

No Impact. Both the NCFPD and the FCFPD would continue to provide fire protection services to the lands surrounding the Project sites during construction. No residential or office construction is identified with this Project. There would be no impact.

ii. Police Protection:

No Impact. Fresno County would continue to provide sheriff protection services to the Project sites upon development. Emergency response is adequate to the Project site. The nearest Fresno County Sheriff's Department is located approximately 5.6 miles southeast of the Crossland Basin site. No residential or office construction is proposed for this Project and no additional police protection would be needed because of the Project. There would be no impact.

iii. Schools:

No Impact. The closest high school is Central High School, located approximately 4 miles west of the Crossland Basin site. The John S. Wash Elementary School is located approximately 1.77 miles northwest of the Crossland Basin site. Implementation would not include construction of any residential structures that would impact any schools. The Project would not result in an increase of population that would require additional school facilities; therefore, there would be no impact.

iv. Parks:

No Impact. There are no recreational lands or public facilities within the vicinities of the Project sites. As the Project would not induce population growth, the project would not create a need for additional park or recreational services. There would be no impact.

v. Other public facilities:

No Impact. No additional public facilities would be impacted by this Project. There would be no additional public wastewater facility or substantial electrical needs generated by this Project. There would be no impact.

4.16 RECREATION

Table 4-26: 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

Fresno County has several regional parks, as well as State and national parks, national forest, wilderness areas and ecological reserves. The development and maintenance of regional parks and landscaped areas is held responsible by the Fresno County Parks Division. The unincorporated areas of Fresno County have approximately 1,165 acres of parkland to serve approximately 174,200 persons. The Parks and Recreation Element of the Fresno County General Plan does not establish a standard for the number of park acres or facilities per person for these uses. The nearest park is the Kearney Park, located approximately 1.25-miles southwest of the proposed Laub Basin site.

The three proposed basin sites are located in Fresno County on land that has historically been utilized for agricultural production.

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 includes the construction and operation of three recharge basins in Fresno County. These recharge basins would not increase the use or demand of any existing neighborhood, regional parks, or other recreational facilities of any kind. No population growth is anticipated or associated with 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 part of the Project components, nor does it propose the expansion of any existing recreational facilities. There would be no impact.

4.17 TRANSPORTATION

Table 4-27: 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

Fresno County's circulation system consists of a roadway network that is primarily rural in character, with exception of the urbanized area surrounding the cities of Fresno and Clovis and various smaller communities in the southern and western parts of the County. The most important inter-regional roadways within the County are the state highways particularly SR 99, SR 41, and Interstate 5.

The Project sites are located in southern Fresno County at the following locations: Krum Basin near the intersection of N. Hayes Avenue and W. McKenzie Avenue, Laub Basin near the intersection of S. Marks Avenue and W. American Avenue, and the Crossland Basin near the intersection of De Wolf Avenue and East Butler Avenue. The Project vicinity is dominated by agricultural uses, sparse rural residential and farmland uses.

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)?

a and b) Less than Significant Impact. The Project includes the construction of an approximately 154 acres of groundwater recharge basins for the District. Construction traffic associated with the Project would be minimal and temporary, lasting approximately six months per basin. Operational traffic consists of as-needed maintenance trips at each site. No road improvements are proposed as a part of the Project. There would not be a significant adverse effect to existing roadways in the area.

Construction associated with the Project would be restricted to the Project sites and it would not intersect any roadways, pedestrian or bicycle paths. These construction-related impacts would be temporary and there would be no impacts to the surrounding transportation network. Road closures and detours are not anticipated as part of construction.

There is no population growth associated with the Project, nor would implementation of the Project result in an increase of staff or drivers utilizing roadways in the area. Therefore, implementation of the Project would not increase the demand for any changes to congestion management programs or interfere with existing level of service standards during the operational phase. Construction-related roadway interferences would be less than significant.

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?

Less than Significant Impact. As mentioned above in Impact Assessments a, b, and c, the Project would not propose new roadway design features or permanent alterations to roadways at any of the basin sites. All potential disturbances to roadways during construction would be temporary. Road closures and detours are not anticipated as part of the construction phase of the Project. The operational phase of the Project would have no effect on roadways or emergency access. Therefore, overall potential Project-related impacts to emergency access on local roadways would be considered less than significant.

4.18 TRIBAL CULTURAL RESOURCES

Table 4-28: 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

Penutian-speaking Yokuts tribal groups occupied the southern San Joaquin Valley region and much of the nearby Sierra Nevada. For a variety of historical reasons, existing research information emphasizes the central Yokuts tribes who occupied both the valley and particularly the foothills of the Sierra. The northernmost tribes suffered from the influx of Euro-Americans during the Gold Rush and their populations were in substantial decline by the time ethnographic studies began in the early twentieth century. In contrast, the southernmost tribes were partially removed by the Spanish to missions and eventually absorbed into multi-tribal communities on the Sebastian Indian Reservation (on Tejon Ranch), and later the Tule River Reservation and Santa Rosa Rancheria to the north, as well as other reservations in the foothills and Sierras. The result is an unfortunate scarcity of ethnographic detail on valley tribes, especially in relation to the rich information collected from the central foothills tribes where native speakers of the Yokuts dialects are still found. Regardless, the general details of indigenous life-ways were similar across the broad expanse of Yokuts territory, particularly in terms of environmentally influenced subsistence and adaptation and with regard to religion and belief, which were similar everywhere. (Appendix C)

Although population estimates vary and population size was greatly affected by the introduction of Euro-American diseases and social disruption, the Yokuts were one of the largest, most successful groups in Native California. It is estimated that the Yokuts region contained 27 percent of the Aboriginal population in the state at the time of contact; other estimates are even higher. Many Yokut descendants continue to live in Fresno County, either on tribal reservations, or in local towns and communities. (Appendix C)

Public Resources Code Section 21080.3.1, et seq. (Codification of AB 52, 2013-14)

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. (Appendix C)

Records Search

An archival records search was conducted at the California State University, Bakersfield, SSJVIC, by SSJVIC staff members December 2023, to determine: (i) if prehistoric or historical cultural resources had previously been recorded within the APE; (ii) if the APE had been systematically surveyed by archaeologists prior to the initiation of this field study; and/or (iii) whether the region of the Project was known to contain archaeological sites and to thereby be archaeologically sensitive. (Appendix C)

According to the records search results, there have been three previous cultural resource studies conducted within the Project area and there have been five previous cultural resource studies conducted within the one-half mile radius. The search also identified six cultural resources within the Project APE and three within a one-half mile radius of the Project APE.

Native American Outreach

The NAHC in Sacramento was also contacted in January 2024. They were provided with a brief description of the Project and a map showing its location and requested that the NAHC perform a search of the Sacred Lands File to determine if any Native American resources have been recorded in the immediate APE. The NAHC identifies, catalogs, and protects Native American cultural resources -- ancient places of special religious or social significance to Native Americans and known ancient graves and cemeteries of Native Americans on private and public lands in California. The NAHC is also charged with ensuring California Native American tribes' accessibility to ancient Native American cultural resources on public lands, overseeing the treatment and disposition of inadvertently discovered Native American human remains and burial items, and administering the California Native American Graves Protection and Repatriation Act, among many other powers and duties. NAHC provide a current list of Native American Tribal contacts to notify of the project. The results of the Sacred Lands File Search were negative for the presence of tribal cultural resources. The 16 tribal representatives identified by NAHC were contacted in writing via United States Postal Service in a letter mailed in January 2024, informing each Tribe of the Project.

1. Buena Vista Rancheria of Me-Wuk Indians, Rhonda Morningstar Pope, Chairperson
2. California Valley Miwok Tribe
3. California Valley Miwok Tribe, AKA Sheep Rancheria of Me-Wuk Indians of CA

4. Confederated Villages of Lisjan Nation, Cheyenne Gould, Tribal Cultural Resource Manager
5. Confederated Villages of Lisjan Nation, Deja Gould, Language Program Manager
6. Confederated Villages of Lisjan Nation, Corrina Gould, Chairperson
7. Ione Band of Miwok Indians, Sara Dutschke, Chairperson
8. North Valley Yokuts Tribe, Katherine Perez, Chairperson
9. North Valley Yokuts Tribe, Timothy Perez
10. Tule River Indian Tribe, Joey Garfield, Tribal Archaeologist
11. Tule River Indian Tribe, Neil Peyron, Chairperson
12. Tule River Indian Tribe, Kerri Vera, Environmental Department
13. Wilton Rancheria, Herbert Griffin, Executive Director of Cultural Preservation
14. Wilton Rancheria, Cultural Preservation Department
15. Wilton Rancheria, Dahlton Brown, Executive Director of Administration
16. Wuksachi Indian Tribe/Eshom Valley Band, Kenneth Woodrow, Chairperson

Phase 1 Pedestrian Survey

An intensive Class III Inventory/Phase I survey of the Project APE was conducted in January 2024 by ASM Affiliates staff. The APE was examined with the field crew walking parallel transects space at approximately 15-m intervals, in order to identify surface artifacts, archaeological indicators (e.g., shellfish or animal bone), and/or archaeological deposits (e.g., organically enriched midden soil); tabulation and recording of surface diagnostic artifacts; site sketch mapping; preliminary evaluation of site integrity; and site recording, following the California Office of Historic Preservation Instructions for Recording Historic Resources, using California Department of Parks and Recreation 523 forms. Special attention was paid to rodent burrow back dirt piles, in the hope of identifying sub-surface soil conditions that might be indicative of archaeological features or remains. (Appendix C).

4.18.2 Impact Assessment

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:

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.

Less than Significant Impact with Mitigation Incorporated. A search of the NAHC Sacred Lands File was completed for the APE. No tribal cultural resources were identified. Additionally, a records search was conducted at the SSJVIC, California State University, Bakersfield. This search also determined that tribal cultural resources were not present on-site.

The District, as a public lead agency, has received formal requests for notification from the Dumna Wo Wah Tribe and the Santa Rosa Rancheria Tachi Yokut Tribe, Public Resources Code Section 21080.3.1 (AB

52). No responses from either tribe have been received. In addition, no comments or concerns were raised about the areas by the contacted tribes during general tribal consultation.

There is little chance the Project would cause a substantial adverse change to the significance of a tribal cultural resource as defined. Mitigation Measures **CUL-1 and CUL-2,** described in Section 4.5.3 are recommended in the event cultural materials or human remains are unearthed during excavation or construction. Implementation of mitigation measures outlined above would reduce impacts to tribal cultural resources to less than significant impacts.

4.18.3 Mitigation

See **CUL-1** and **CUL-2** outlined above in Section 4.5.3.

4.19 UTILITIES AND SERVICE SYSTEMS

Table 4-29: 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

Water Supply

The Project is located within the Kings Subbasin of the overarching San Joaquin Valley Groundwater Basin, as defined by the California Department of Water Resources Groundwater Bulletin 118. Declines in groundwater basin storage and groundwater overdraft are recurring problems in Fresno County. Measures for ensuring the continued availability of groundwater for municipal needs have been identified and planned in several areas of the county. The measures include groundwater conservation and recharge, and supplementing or replacing groundwater sources for irrigation with surface water.

Wastewater Collection and Treatment

The City of Fresno, Fresno Wastewater Treatment and Collection System Facility is the closest wastewater facility.

Landfills

The closest landfill to the Project site is owned and operated by American Avenue Landfill over 14-miles southwest of the Krum Basin site.

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?

No Impact. The Project would not require construction of new or relocation or expansion of existing facilities for water, wastewater treatment, storm water drainage, electric power, natural gas, or telecommunications. There would be no impact.

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?

No Impact. The Project consists of construction of three groundwater recharge basins, approximately 154 acres total. The recharged water would be used in the District efforts to achieve groundwater sustainability. Project operation would be passive and would not reduce the area's available water supply under any scenario. Therefore, there would be no impact.

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 require or result in the construction of new storm water drainage facilities or expansion of existing facilities. 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?

Less than Significant Impact. The Project would generate some solid waste during construction; however, it would be temporary and properly disposed of during construction and upon completion. No solid waste would be generated during operation and maintenance. Any impacts with regard to solid waste would be less than significant.

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 related to solid waste. There would be no impact.

4.20 WILDFIRE

Table 4-30: 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 is located in the western unincorporated jurisdiction of Fresno County in the Central San Joaquin Valley. Lands in the Project's vicinity consist of relatively flat, irrigated farmland, agricultural infrastructure, and rural residences. The nearest Project site to a State Responsibility Area (SRA) is the Crossland Basin site located approximately 8.7 miles southwest. [28] According to California Department of Forestry and Fire Protection, the nearest Very High Fire Hazard Severity Zone to the Project is located approximately 21 miles northeast of the Crossland Basin site.[29] Although California's climate makes it susceptible to wildfires, the Project sites are not specifically located in an area that is known for wildfires.

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

[28] (CalFIRE 2022)
[29] (CalFIRE 2022)

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, 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?

a-d) No Impact. The Project sites are not located in or near an SRA nor located on lands classified as very high fire hazard severity zones. The nearest SRA Fire Hazard Zone is located 21 miles northeast of the Crossland Basin site. Construction or implementation of the proposed basins would not impede any existing or future emergency response plans. The Project sites and the surrounding lands consist of agricultural and related infrastructure on relatively flat and open land. Additionally, the Project would not include the construction of any residential components or structures of any kind, nor would it require any employees to be stationed permanently at the site on a daily basis. There would be no impacts.

4.21 CEQA MANDATORY FINDINGS OF SIGNIFICANCE

Table 4-31: 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 potential for impacts to biological resources, cultural resources, and tribal cultural resources from the construction and operation of the Project would be less than significant with the incorporation of the mitigation measures discussed above and outlined in Chapter 5 Mitigation, Monitoring, and Reporting Program. Accordingly, the Project would not involve any 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 eliminate important examples of the major periods of California history or prehistory. The analysis conducted in this IS/MND results in a determination that the Project, with incorporation of mitigation measures discussed above and outlined in Chapter 5 Mitigation, Monitoring, and Reporting Program, would have a less than significant effect on the environment.

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 would include the construction of three groundwater recharge basins and connecting these basins to existing District canal infrastructure.

No additional roads would be constructed as a result of the Project, nor would any additional public services be required. The Project is not expected to result in direct or indirect population growth. Therefore, implementation of the Project would not result in significant cumulative impacts and all potential impacts would be reduced to less than significant through the implementation of mitigation measures and basic regulatory requirements incorporated into future Project design.

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 the construction of three groundwater recharge basins within District boundaries. The Project in and of itself would not create a significant hazard to the public or the environment. Construction-related air quality/dust exposure impacts could occur temporarily as a result of project construction. However, implementation of basic regulatory requirements identified in this IS/MND would ensure that impacts are less than significant. Therefore, the Project would not have any direct or indirect adverse impacts on humans. The impacts 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 IS/MND for the Recharge Basin Phase II Project (Project) located in Fresno Irrigation District in Fresno County (County). 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 APEs. 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 APEs, 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	FID with assistance of a qualified biological subconsultant	WEAP Form	
BIO-2	(BMPs): The project proponent will ensure that all workers employ the following best management practices (BMPs) in order to avoid and minimize potential impacts to special status species: • All open structures within the APEs must be filled, covered, or removed from the APEs.	Prior to the start of any construction activities	During Construction	FID		

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
	Prior to filling, covering, or removing the structures, they must be inspected by a biologist. • Vehicles will observe a 15-mph speed limit while on unpaved access routes. • Workers will inspect areas beneath parked vehicles, equipment, and materials prior to mobilization. If special status species are detected, the individual will either be allowed to leave of its own volition or will be captured by the qualified biologist (must possess appropriate collecting/handling permits) and relocated out of harm's way to the nearest suitable habitat beyond the influence of the project work area. "Take" of a state or federal special status (rare, California Species of Special Concern, threatened, or endangered) species is prohibited. • 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					
Project-Related Impacts to Special Status Plant Species						
BIO-3	(*Timing*): The project should conduct activities in the canal/ditch habitat when they are dry.	During construction activities	As determined by qualified biologist during construction activities	FID		
BIO-4	(*Pre-Construction Survey*): Should project activities be required when the canal/ditch habitat is inundated a qualified botanist/biologist will conduct focused botanical surveys within the canal/ditch habitat during the Sanford's arrowhead blooming season (May-	May to October	Prior to construction activities	FID with assistance of a qualified biological subconsultant	Biological Memo	

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
	October), 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 and prior to the start of construction.					
BIO-5	**(*Avoidance*):** If Sanford's arrowhead individuals are identified during a survey, an avoidance buffer and, if necessary, use of exclusion fencing, will be placed around the area as not to disturb the plants or its root system.	During construction activities	As determined needed by qualified biologist during construction activities	FID with assistance of a qualified biological subconsultant		
BIO-6	**(*Formal Consultation*):** If Sanford's arrowhead individuals or populations or sensitive natural communities are detected within project work areas during the focused botanical survey(s), and the plants cannot be avoided, the project proponent will have a qualified biologist write a relocation plan in consultation with CNPS.	During construction activities	As determined needed by qualified biologist during construction activities	FID with assistance of a qualified biological subconsultant	Relocation Plan or consultation with CNPS	
Project-Related Mortality and/or Disturbance to American Badger						
BIO-7	**(*Pre-construction Take Avoidance Survey*):** A qualified biologist will conduct a pre-construction survey of each APE within seven (7) days prior to vegetation clearing or ground disturbing activities. The goal of this survey is to search for potentially active badger dens.	7 days Prior to construction	Once, Prior to ground disturbing activities and the start of construction	FID with assistance of a qualified biological subconsultant	Biological Memo	
BIO-8	**(*Remote Cameras*):** If potential dens for American badger are detected during the pre-construction surveys, each potential den will be monitored with remote cameras for a period of three consecutive nights. If there is no activity at the den location recorded for three consecutive nights, the den can be deemed "inactive" or "unoccupied" and closed or excavated.	Prior to construction activities	Once, Prior to ground disturbing activities and the start of construction	FID with assistance of a qualified biological subconsultant	Biological Memo	
BIO-9	**(*Den Avoidance*):** If an American badger is denning on or within 50 feet of any APE, the project proponent shall avoid the den by a minimum 50-foot buffer.	During construction activities	As determined needed by qualified biologist during	FID with assistance of a qualified biological subconsultant	Biological Memo	

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
			construction activities			
BIO-10	(***Eviction and Den Excavation***)**:** If an American badger is denning on or within 50 feet of any APE and it cannot be avoided, the badger may be evicted, and the den excavated outside of the natal season (generally March 15 – June 15) or if it is determined that there are no cubs in the den. Prior to the planned eviction and den excavation a remote camera will be placed at the den entrance for a minimum of three consecutive nights to record the general time when the badger leaves the den. If it is outside of the natal season or it is determined by a qualified biologist that there are no cubs present in the den the badger will be evicted from the den and the den excavated by hand, with the assistance of machinery, after it has left the den for that night. Should any cubs be discovered during the excavation the work will stop and the crew will leave the site immediately so the female can rescue her cubs and relocate them.	March 15 to June 15	As determined needed by qualified biologist during construction activities	FID with assistance of a qualified biological subconsultant	Biologist Report	
Project-Related Mortality and/or Disturbance to Burrowing Owl						
BIO-11	(***Pre-construction Take Avoidance Survey***)**:** Within seven (7) days prior to the start of construction activities a qualified biologist will conduct a pre-construction take avoidance survey for BUOW and suitable burrows at each APE in accordance with CDFW's *Staff Report on Burrowing Owl Mitigation* (2012). The surveys shall include the APEs and surrounding lands up to 500 feet. If no BUOW individuals or active burrows are observed, no further mitigation is required.	7 days prior to construction	Once, Prior to ground disturbing activities and the start of construction	FID with assistance of a qualified biological subconsultant	Biologist Report	
BIO-12	(***Avoidance***)**:** If an active BUOW burrow is detected avoidance buffers shall be implemented. 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 burrow(s), and the level of project disturbance. If	During construction activities	As determined needed by qualified biologist during construction activities	FID with assistance of a qualified biological subconsultant	Biologist Report	

Item	Mitigation Measure	When Monitoring is to Occur	Frequency of Monitoring	Agency Responsible for Monitoring	Method to Verify Compliance	Verification of Compliance
	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 and all BUOW have left the APE.					
BIO-13	(*Passive Relocation*): If avoidance of an active BUOW burrow is not feasible, passive relocation may be completed during the non-breeding season (September 1 through January 31) or during the breeding season (February 1 through August 31) if a qualified biologist determines that there are no young in the burrow. Prior to completion a qualified biologist will prepare a passive relocation plan that would detail the methods to be used. It would include the tools to exclude the BUOW from its burrow (i.e., one-way doors or other devices) and excavate the burrow (hand tools and machinery, if needed). Following completion of passive relocation, a report will be prepared that documents the methods and results of these efforts.	September 1 to January 31 or February 1 to August 31	Once, as determined needed by qualified biologist during construction activities	FID with assistance of a qualified biological subconsultant	Biologist Report	
Project-Related Mortality and/or Nest Abandonment of Migratory Birds, Raptors, and Special Status Birds Including Swainsons Hawk						
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 needed by qualified biologist during construction activities	FID with assistance of a qualified biological subconsultant	Biologist 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 pre-construction take avoidance survey for Swainson's hawk nests onsite and within a 0.5-mile radius within seven (7) calendar days prior to the start of construction at all APEs. 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. The survey would also include inspecting	7 days prior to construction	Once, Prior to ground disturbing activities and the start of construction	FID with assistance of a qualified biological subconsultant	Biologist 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
	for nesting migratory birds within and up to 50 feet outside of each APE and for other nesting raptors within up to 450 feet outside of each APE. 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 construction activities	Once, Prior to ground disturbing activities and the start of construction	FID with assistance of a qualified biological subconsultant	Biologist Report	
Project-Related Mortality and/or Disturbance of Maternity Roosting Bats and Special Status Bats Including Pallid Bat and Western Mastiff Bat						
BIO-17	(*Overwintering Season Avoidance*)**:** Project activities will avoid the concrete structure by at least 150 feet during the overwintering season (December 1 through February 28). Lighting is not to be used near the structure where it would shine on or into a potential roost entrance. Combustion equipment, such as generators, pumps, and vehicles are not to be parked, operated, over or adjacent to the structure.	December 1 to February 28	Once, as determined needed by qualified biologist during construction activities	FID with assistance of a qualified biological subconsultant	Biologist Report	
BIO-18	(*Pre-Construction Survey*)**:** From March 1 through November 31, a pre-construction guano and emergence survey will be performed prior to disturbing, closing, or removing the underground structure or working within 150 feet of the structure to identify if there are bats roosting in the structure. A qualified biologist will conduct the survey 2 days or less prior to working on or around the structure.	March 1 to November 31, at least 2 days prior to construction activities on or around concrete structure	Once, as determined needed by qualified biologist during construction activities	FID with assistance of a qualified biological subconsultant	Biologist Report	
BIO-19	(*Maternity Season Avoidance*)**:** Should an active maternity roost be identified during the pre-construction survey; project activities shall avoid working within 150 feet of the roost until a qualified	Prior to construction activities	Once, Prior to ground disturbing activities and the	FID with assistance of a qualified biological subconsultant	Biologist 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
	biologist has determined that the young have been fully reared. Lighting is not to be used near maternity 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, over or adjacent to the maternity roost.		start of construction			
BIO-20	(*Eviction*): Should a pallid bat or western mastiff bat roost be observed when the roost is not being used as a maternity or overwintering roost, the bats may be evicted. Prior to completion a qualified biologist will prepare an eviction plan that would detail the methods to be used. It would include the tools to evict the bats from the structure (i.e., one-way doors or other devices) and safely dismantle the roost. Following completion of eviction, a report will be prepared that documents the methods and results of these efforts.	Prior to construction activities	Once, Prior to ground disturbing activities and the start of construction	FID with assistance of a qualified biological subconsultant	Biologist Report	
BIO-21	(*Deterrence*): If construction is paused for two days or more while removing the underground structure, a qualified biologist will determine what can be used to deter bats from using the structure as a roosting site between construction activities.	If construction is paused for two days or more	Once	FID with assistance of a qualified biological subconsultant	Biologist Report	
Project-Related Mortality and/or Disturbance To San Joaquin Kit Fox						
BIO-22	(*Pre-Construction Survey*): Within seven (7) days prior to the start of construction a pre-construction survey for SJKF will be conducted on and within 200 feet of each APE.	7 days prior to construction	Once, as determined needed by qualified biologist during construction activities	FID with assistance of a qualified biological subconsultant	Biologist Report	
BIO-23	(Establish Buffers): On discovery of any SJKF dens near any APE a qualified biologist will determine appropriate construction setback distances (buffer zones) based on applicable USFWS guidelines (see below). If needed, construction buffers will be identified with flagging, fencing, or other easily visible means. They will be maintained until the biologist has	Upon discovery of SJKF dens	Once, as determined needed by qualified biologist during construction activities	FID with assistance of a qualified biological subconsultant	Biologist 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
	determined that the den will no longer be impacted by construction or the SJKF has left. 1. At least 100 feet around den(s); 2. At least 200 feet around natal dens (which SJKF young are reared); and 3. At least 500 feet around any natal dens with pups (except for any portions of the buffer zone that is already fully developed).					
BIO-24	(*Avoidance and Minimization*): The project will observe all avoidance and minimization measures during construction and on-going operational activities identified in the USFWS's *Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance* (2011), including, but not limited to: maintaining buffer zones and construction speed limits; covering pipes; installing escape structures; restriction of herbicide and rodenticide use; proper disposal of food items and trash; prohibition of pets and firearms; and completion of an employee education program (see **BIO-1**).	During construction activities	During construction activities	FID with assistance of a qualified biological subconsultant	Biologist Report	
Project-Related Impacts to Wildlife Movement Corridors and Native Wildlife Nursery Sites						
BIO-25	(*Operational Hours*): The project's construction activities will occur in the canal/ditch habitat, if feasible, between a half hour after sunrise and a half hour before sunset (i.e., day-time hours) to avoid impacts to wildlife movement corridors.	Between a half hour after sunrise and a half hour before sunset	During construction activities	FID with assistance of a qualified biological subconsultant		
BIO-26	(*Wildlife Access*): Should construction activities in the canal/ditch habitat occur between a half hour before sunset and a half hour after sunrise (i.e., night-time hours) each canal/ditch will not be blocked, if feasible, during night-time hours. If construction must block one or both sides of the canal/ditch habitat during night-time hours, an alternative route through the construction area to allow wildlife to move through the area shall be identified by a qualified biologist and maintained throughout the construction schedule timeframe in the canal/ditch habitat.	Between a half hour after sunrise and a half hour before sunset	During construction activities	FID with assistance of a qualified biological subconsultant		

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
BIO-27	(*Covers and Inspections*): Project pipes, culverts, siphons, excavations, and vertical pipes along the canal/ditch habitat will be covered each night to prevent wildlife from falling in or entering and becoming trapped or injured during migratory or dispersal movements. All pipelines, culverts, siphons, excavations, and vertical pipes along the canal/ditch habitat will be inspected for trapped wildlife before moving, burying, or capping.	Daily during construction activities	Daily during construction activities	FID with assistance of a qualified biological subconsultant		
Cultural Resources						
CUL-1	(Archaeological Remains) 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.	During construction	Daily during construction activities	FID	Report	
CUL-2	(Human Remains) In the event human remains are uncovered, or in any other case when human remains are discovered during construction, the Fresno 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.	During construction	Daily during construction activities	FID	Report	
Tribal Cultural Resources						
TCR-1	See CUL-1 and CUL-2 above					

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Appendix A: Air Quality - CalEEMod Output Files

FID Multiple Basins Detailed Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	FID Multiple Basins
Construction Start Date	9/1/2025
Operational Year	2026
Lead Agency	Fresno Irrigation District
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.70
Precipitation (days)	22.6
Location	36.65684048538556, -119.84600525241005
County	Fresno
City	Unincorporated
Air District	San Joaquin Valley APCD
Air Basin	San Joaquin Valley
TAZ	2490
EDFZ	5
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.20

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description

Other Non-Asphalt Surfaces	154	Acre	154	0.00	0.00	—	—	—
Road Construction	0.25	Mile	0.16	0.00	—	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	7.86	6.63	59.1	61.3	0.11	2.57	9.17	11.7	2.37	4.14	6.50	—	12,092	12,092	0.49	0.11	1.11	12,138
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	3.89	3.27	29.7	28.9	0.06	1.23	3.70	4.93	1.14	1.45	2.59	—	6,706	6,706	0.27	0.06	0.01	6,731
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.11	0.93	8.46	8.38	0.02	0.36	1.18	1.53	0.33	0.50	0.82	—	1,834	1,834	0.07	0.02	0.06	1,840
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.20	0.17	1.54	1.53	< 0.005	0.06	0.21	0.28	0.06	0.09	0.15	—	304	304	0.01	< 0.005	0.01	305

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	7.86	6.63	59.1	61.3	0.11	2.57	9.17	11.7	2.37	4.14	6.50	—	12,092	12,092	0.49	0.11	1.11	12,138
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	3.89	3.27	29.7	28.9	0.06	1.23	3.70	4.93	1.14	1.45	2.59	—	6,706	6,706	0.27	0.06	0.01	6,731
2026	3.70	3.11	27.3	28.1	0.06	1.12	3.70	4.82	1.03	1.45	2.48	—	6,704	6,704	0.27	0.06	0.01	6,728
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	1.11	0.93	8.46	8.38	0.02	0.36	1.18	1.53	0.33	0.50	0.82	—	1,834	1,834	0.07	0.02	0.06	1,840
2026	0.46	0.38	3.37	3.55	0.01	0.14	0.42	0.56	0.13	0.16	0.29	—	827	827	0.03	0.01	0.02	830
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.20	0.17	1.54	1.53	< 0.005	0.06	0.21	0.28	0.06	0.09	0.15	—	304	304	0.01	< 0.005	0.01	305
2026	0.08	0.07	0.61	0.65	< 0.005	0.03	0.08	0.10	0.02	0.03	0.05	—	137	137	0.01	< 0.005	< 0.005	137

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.00	1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.00	1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.00	1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Area	0.00	1.04	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Water	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Waste	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Area	—	1.04	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Water	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Waste	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Area	0.00	1.04	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Water	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Waste	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Area	0.00	0.19	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Water	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Waste	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3. Construction Emissions Details

3.1. Site Preparation (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.94	3.31	31.6	30.2	0.05	1.37	—	1.37	1.26	—	1.26	—	5,295	5,295	0.21	0.04	—	5,314

Dust From Material Movement	—	—	—	—	—	—	7.67	7.67	—	3.94	3.94	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.22	0.18	1.73	1.65	< 0.005	0.07	—	0.07	0.07	—	0.07	—	290	290	0.01	< 0.005	—	291
Dust From Material Movement	—	—	—	—	—	—	0.42	0.42	—	0.22	0.22	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.03	0.32	0.30	< 0.005	0.01	—	0.01	0.01	—	0.01	—	48.0	48.0	< 0.005	< 0.005	—	48.2
Dust From Material Movement	—	—	—	—	—	—	0.08	0.08	—	0.04	0.04	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.08	0.04	0.65	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	106	106	< 0.005	< 0.005	0.40	108
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.34	5.34	< 0.005	< 0.005	0.01	5.43
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.88	0.88	< 0.005	< 0.005	< 0.005	0.90
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.3. Grading (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.80	3.20	29.7	28.3	0.06	1.23	—	1.23	1.14	—	1.14	—	6,599	6,599	0.27	0.05	—	6,622
Dust From Material Movement	—	—	—	—	—	—	3.59	3.59	—	1.42	1.42	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	3.80	3.20	29.7	28.3	0.06	1.23	—	1.23	1.14	—	1.14	—	6,599	6,599	0.27	0.05	—	6,622
Dust From Material Movement	—	—	—	—	—	—	3.59	3.59	—	1.42	1.42	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.71	0.60	5.58	5.32	0.01	0.23	—	0.23	0.21	—	0.21	—	1,240	1,240	0.05	0.01	—	1,244
Dust From Material Movement	—	—	—	—	—	—	0.67	0.67	—	0.27	0.27	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	0.11	1.02	0.97	< 0.005	0.04	—	0.04	0.04	—	0.04	—	205	205	0.01	< 0.005	—	206
Dust From Material Movement	—	—	—	—	—	—	0.12	0.12	—	0.05	0.05	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.09	0.05	0.74	0.00	0.00	0.11	0.11	0.00	0.03	0.03	—	121	121	< 0.005	0.01	0.45	123
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.08	0.05	0.60	0.00	0.00	0.11	0.11	0.00	0.03	0.03	—	108	108	< 0.005	0.01	0.01	109
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.01	0.01	0.12	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	20.9	20.9	< 0.005	< 0.005	0.04	21.3
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.47	3.47	< 0.005	< 0.005	0.01	3.52
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.5. Grading (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.62	3.04	27.2	27.6	0.06	1.12	—	1.12	1.03	—	1.03	—	6,599	6,599	0.27	0.05	—	6,621

Dust From Material Movement	—	—	—	—	—	—	3.59	3.59	—	1.42	1.42	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.41	0.35	3.09	3.13	0.01	0.13	—	0.13	0.12	—	0.12	—	749	749	0.03	0.01	—	752
Dust From Material Movement	—	—	—	—	—	—	0.41	0.41	—	0.16	0.16	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.06	0.56	0.57	< 0.005	0.02	—	0.02	0.02	—	0.02	—	124	124	0.01	< 0.005	—	124
Dust From Material Movement	—	—	—	—	—	—	0.07	0.07	—	0.03	0.03	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.05	0.55	0.00	0.00	0.11	0.11	0.00	0.03	0.03	—	105	105	< 0.005	0.01	0.01	107
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	12.4	12.4	< 0.005	< 0.005	0.02	12.6
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.05	2.05	< 0.005	< 0.005	< 0.005	2.09
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.7. Building Construction (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.28	1.07	9.85	13.0	0.02	0.38	—	0.38	0.35	—	0.35	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.03	0.27	0.36	< 0.005	0.01	—	0.01	0.01	—	0.01	—	65.7	65.7	< 0.005	< 0.005	—	65.9
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.01	0.01	0.05	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	10.9	10.9	< 0.005	< 0.005	—	10.9
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.9. Linear, Grubbing & Land Clearing (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.46	0.39	3.39	3.49	< 0.005	0.21	—	0.21	0.19	—	0.19	—	490	490	0.02	< 0.005	—	492
Dust From Material Movemen	—	—	—	—	—	—	0.21	0.21	—	0.02	0.02	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	2.69	2.69	< 0.005	< 0.005	—	2.70
Dust From Material Movemen	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.44	0.44	< 0.005	< 0.005	—	0.45
Dust From Material Movemen	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.01	0.19	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	30.3	30.3	< 0.005	< 0.005	0.11	30.8
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.15	0.15	< 0.005	< 0.005	< 0.005	0.16
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.03	0.03	< 0.005	< 0.005	< 0.005	0.03
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.11. Linear, Grading & Excavation (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.71	3.11	27.3	29.4	0.06	1.21	—	1.21	1.11	—	1.11	—	6,496	6,496	0.26	0.05	—	6,518

Dust From Material Movement	—	—	—	—	—	—	1.24	1.24	—	0.13	0.13	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.09	0.08	0.67	0.72	< 0.005	0.03	—	0.03	0.03	—	0.03	—	160	160	0.01	< 0.005	—	161
Dust From Material Movement	—	—	—	—	—	—	0.03	0.03	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.01	0.12	0.13	< 0.005	0.01	—	0.01	< 0.005	—	< 0.005	—	26.5	26.5	< 0.005	< 0.005	—	26.6
Dust From Material Movement	—	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.14	0.13	0.07	1.12	0.00	0.00	0.16	0.16	0.00	0.04	0.04	—	182	182	0.01	0.01	0.68	185
Vendor	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	13.2	13.2	< 0.005	< 0.005	0.03	13.8
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	4.12	4.12	< 0.005	< 0.005	0.01	4.19
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.32	0.32	< 0.005	< 0.005	< 0.005	0.34
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.68	0.68	< 0.005	< 0.005	< 0.005	0.69
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.05	0.05	< 0.005	< 0.005	< 0.005	0.06
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.13. Linear, Drainage, Utilities, & Sub-Grade (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.99	2.51	22.9	23.6	0.05	0.91	—	0.91	0.84	—	0.84	—	5,694	5,694	0.23	0.05	—	5,713
Dust From Material Movement	—	—	—	—	—	—	1.03	1.03	—	0.11	0.11	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.04	0.38	0.39	< 0.005	0.02	—	0.02	0.01	—	0.01	—	93.6	93.6	< 0.005	< 0.005	—	93.9
Dust From Material Movement	—	—	—	—	—	—	0.02	0.02	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.07	0.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	15.5	15.5	< 0.005	< 0.005	—	15.5
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.11	0.06	0.93	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	152	152	< 0.005	0.01	0.57	154
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.29	2.29	< 0.005	< 0.005	< 0.005	2.33
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.38	0.38	< 0.005	< 0.005	< 0.005	0.39
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.15. Linear, Paving (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.06	0.89	7.71	10.8	0.01	0.34	—	0.34	0.31	—	0.31	—	1,620	1,620	0.07	0.01	—	1,625
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.06	0.09	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	13.3	13.3	< 0.005	< 0.005	—	13.4
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.01	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	2.20	2.20	< 0.005	< 0.005	—	2.21
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.08	0.04	0.65	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	106	106	< 0.005	< 0.005	0.40	108
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.80	0.80	< 0.005	< 0.005	< 0.005	0.81
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.13	0.13	< 0.005	< 0.005	< 0.005	0.13
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.53	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.51	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	1.04	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.53	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.51	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	1.04	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.09	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.19	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Site Preparation	Site Preparation	9/1/2025	9/26/2025	5.00	20.0	—
Grading	Grading	9/27/2025	2/27/2026	5.00	110	—
Building Construction	Building Construction	2/28/2026	3/13/2026	5.00	10.0	—
Linear, Grubbing & Land Clearing	Linear, Grubbing & Land Clearing	9/1/2025	9/3/2025	5.00	2.00	—

Linear, Grading & Excavation	Linear, Grading & Excavation	9/4/2025	9/16/2025	5.00	9.00	—
Linear, Drainage, Utilities, & Sub-Grade	Linear, Drainage, Utilities, & Sub-Grade	9/17/2025	9/25/2025	5.00	6.00	—
Linear, Paving	Linear, Paving	9/26/2025	9/30/2025	5.00	3.00	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Linear, Grubbing & Land Clearing	Crawler Tractors	Diesel	Average	1.00	8.00	87.0	0.43
Linear, Grubbing & Land Clearing	Excavators	Diesel	Average	1.00	8.00	36.0	0.38

Linear, Grubbing & Land Clearing	Signal Boards	Electric	Average	0.00	8.00	6.00	0.82
Linear, Grading & Excavation	Crawler Tractors	Diesel	Average	1.00	8.00	87.0	0.43
Linear, Grading & Excavation	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Linear, Grading & Excavation	Graders	Diesel	Average	1.00	8.00	148	0.41
Linear, Grading & Excavation	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Linear, Grading & Excavation	Rubber Tired Loaders	Diesel	Average	1.00	8.00	150	0.36
Linear, Grading & Excavation	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Linear, Grading & Excavation	Signal Boards	Electric	Average	0.00	8.00	6.00	0.82
Linear, Grading & Excavation	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Linear, Drainage, Utilities, & Sub-Grade	Air Compressors	Diesel	Average	1.00	8.00	37.0	0.48
Linear, Drainage, Utilities, & Sub-Grade	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Linear, Drainage, Utilities, & Sub-Grade	Graders	Diesel	Average	1.00	8.00	148	0.41
Linear, Drainage, Utilities, & Sub-Grade	Plate Compactors	Diesel	Average	1.00	8.00	8.00	0.43
Linear, Drainage, Utilities, & Sub-Grade	Pumps	Diesel	Average	1.00	8.00	11.0	0.74
Linear, Drainage, Utilities, & Sub-Grade	Rough Terrain Forklifts	Diesel	Average	1.00	8.00	96.0	0.40
Linear, Drainage, Utilities, & Sub-Grade	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Linear, Drainage, Utilities, & Sub-Grade	Signal Boards	Electric	Average	0.00	8.00	6.00	0.82

Linear, Drainage, Utilities, & Sub-Grade	Tractors/Loaders/Backh	Diesel	Average	2.00	8.00	84.0	0.37
Linear, Paving	Pavers	Diesel	Average	1.00	8.00	81.0	0.42
Linear, Paving	Paving Equipment	Diesel	Average	1.00	8.00	89.0	0.36
Linear, Paving	Rollers	Diesel	Average	3.00	8.00	36.0	0.38
Linear, Paving	Signal Boards	Electric	Average	0.00	8.00	6.00	0.82
Linear, Paving	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	7.70	LDA,LDT1,LDT2
Site Preparation	Vendor	—	4.00	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	20.0	7.70	LDA,LDT1,LDT2
Grading	Vendor	—	4.00	HHDT,MHDT
Grading	Hauling	0.00	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	0.00	7.70	LDA,LDT1,LDT2
Building Construction	Vendor	0.00	4.00	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT

Linear, Grubbing & Land Clearing	—	—	—	—
Linear, Grubbing & Land Clearing	Worker	5.00	7.70	LDA,LDT1,LDT2
Linear, Grubbing & Land Clearing	Vendor	0.00	4.00	HHDT,MHDT
Linear, Grubbing & Land Clearing	Hauling	0.00	20.0	HHDT
Linear, Grubbing & Land Clearing	Onsite truck	—	—	HHDT
Linear, Grading & Excavation	—	—	—	—
Linear, Grading & Excavation	Worker	30.0	7.70	LDA,LDT1,LDT2
Linear, Grading & Excavation	Vendor	1.00	4.00	HHDT,MHDT
Linear, Grading & Excavation	Hauling	0.00	20.0	HHDT
Linear, Grading & Excavation	Onsite truck	—	—	HHDT
Linear, Drainage, Utilities, & Sub-Grade	—	—	—	—
Linear, Drainage, Utilities, & Sub-Grade	Worker	25.0	7.70	LDA,LDT1,LDT2
Linear, Drainage, Utilities, & Sub-Grade	Vendor	0.00	4.00	HHDT,MHDT
Linear, Drainage, Utilities, & Sub-Grade	Hauling	0.00	20.0	HHDT
Linear, Drainage, Utilities, & Sub-Grade	Onsite truck	—	—	HHDT
Linear, Paving	—	—	—	—
Linear, Paving	Worker	17.5	7.70	LDA,LDT1,LDT2
Linear, Paving	Vendor	0.00	4.00	HHDT,MHDT
Linear, Paving	Hauling	0.00	20.0	HHDT
Linear, Paving	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Site Preparation	—	—	30.0	0.00	—
Grading	—	—	330	0.00	—
Linear, Grubbing & Land Clearing	—	—	0.16	0.00	—
Linear, Grading & Excavation	—	—	0.16	0.00	—
Linear, Drainage, Utilities, & Sub-Grade	—	—	0.16	0.00	—

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	2	61%	61%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Other Non-Asphalt Surfaces	154	0%
Road Construction	0.16	100%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O

2025	0.00	204	0.03	< 0.005
2026	0.00	204	0.03	< 0.005

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
0	0.00	0.00	0.00	402,494

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Other Non-Asphalt Surfaces	0.00	204	0.0330	0.0040	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Other Non-Asphalt Surfaces	0.00	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Other Non-Asphalt Surfaces	0.00	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor

5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)

5.17. User Defined

Equipment Type	Fuel Type

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	27.0	annual days of extreme heat
Extreme Precipitation	1.65	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	0.00	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	2	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	0	0	0	N/A

Drought	0	0	0	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	2	1	1	3
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	1	1	1	2
Drought	1	1	1	2
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	80.0
AQ-PM	94.3
AQ-DPM	35.0
Drinking Water	98.5
Lead Risk Housing	72.8
Pesticides	92.0
Toxic Releases	76.5
Traffic	3.39
Effect Indicators	—
CleanUp Sites	85.6
Groundwater	70.6
Haz Waste Facilities/Generators	97.9
Impaired Water Bodies	0.00
Solid Waste	92.0
Sensitive Population	—
Asthma	93.4
Cardio-vascular	75.0
Low Birth Weights	74.2
Socioeconomic Factor Indicators	—
Education	73.4
Housing	20.6
Linguistic	63.0
Poverty	78.0
Unemployment	60.6

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	36.10932888
Employed	23.88040549
Median HI	36.22481714
Education	—
Bachelor's or higher	22.50737842
High school enrollment	24.98395996
Preschool enrollment	49.90375978
Transportation	—
Auto Access	51.48209932
Active commuting	22.41755422
Social	—
2-parent households	61.83754652
Voting	33.01680996
Neighborhood	—
Alcohol availability	71.21775953
Park access	6.300526113
Retail density	10.25279097
Supermarket access	16.28384448
Tree canopy	4.529706147
Housing	—
Homeownership	57.03836777
Housing habitability	60.29770307
Low-inc homeowner severe housing cost burden	95.18798922

Low-inc renter severe housing cost burden	55.76799692
Uncrowded housing	34.89028615
Health Outcomes	—
Insured adults	39.81778519
Arthritis	0.0
Asthma ER Admissions	5.4
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	10.5
Cognitively Disabled	32.0
Physically Disabled	47.8
Heart Attack ER Admissions	10.7
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	75.0
Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—

Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	43.1
Elderly	50.9
English Speaking	42.8
Foreign-born	37.5
Outdoor Workers	7.5
Climate Change Adaptive Capacity	—
Impervious Surface Cover	94.4
Traffic Density	10.5
Traffic Access	0.0
Other Indices	—
Hardship	67.1
Other Decision Support	—
2016 Voting	29.5

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	96.0
Healthy Places Index Score for Project Location (b)	29.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	Yes
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Construction: Construction Phases	Construction schedule
Construction: Off-Road Equipment	—

HARP Project Summary Report 10/26/2023 8:47:28 AM

PROJECT INFORMATION
HARP Version: 22118
Project Name: FID_MULTIPLEBASINS
Project Output Directory: G:\Fresno ID - 1038\103823004-Multiple Basins Env Services\200 Technical\215 Env Planning\Appendices\App A -Air Quality\ FID_MULTIPLEBASINS HARP Database: NA

FACILITY INFORMATION
Origin
X (m):242026
Y (m):4070596
Zone:11
No. of Sources:1
No. of Buildings:0

EMISSION INVENTORY
No. of Pollutants:1
No. of Background Pollutants:0

Emissions
ScrID StkID ProID PolID PolAbbrev Multi Annual Ems MaxHr Ems MWAF
(lbs/yr) (lbs/hr)

PJT_AREA 0 0
9901 DieselExhPM 1 120 0.32125 1

Background
PolID PolAbbrev Conc (ug/m^3) MWAF

Ground level concentration files (\glc\)

9901MAXHR.txt
9901PER.txt

POLLUTANT HEALTH INFORMATION
Health Database: C:\HARP2\Tables\HEALTH17320.mdb
Health Table Version: HEALTH22013
Official: True

PolID PolAbbrev InhCancer OralCancer AcuteREL InhChronicREL OralChronicREL InhChronic8HRREL

9901 DieselExhPM 1.1 5

AIR DISPERSION MODELING INFORMATION Versions used in HARP. All executables were obtained from USEPA's Support Center for Regulatory Atmospheric Modeling website (http://www.epa.gov/scram001/) AERMOD: 18081
AERMAP: 18081
BPIPPRM: 04274
AERPLOT: 13329

METEOROLOGICAL INFORMATION
Version: 18081
Surface File: G:\Fresno ID - 1038\103823004-Multiple Basins Env Services\200 Technical\215 Env Planning\Appendices\App A -Air Quality\FID_MULTIPLEBASINS\Fresno_2013-2017.SFC Profile File: G:\Fresno ID - 1038\103823004-Multiple Basins Env Services\200 Technical\215 Env Planning\Appendices\App A -Air Quality\FID_MULTIPLEBASINS\Fresno_2013-2017.PFL Surface Station: 93193
Upper Station: 23230
On-Site Station: 0
Start Date & Time: 13 1 1 1
End Date & Time: 17 12 31 24
Hours Processed: 43824
Calm Hours: 1891
Missing Hours: 535

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AERMOD Output File: \FID_MULTIPLEBASINS_AERMOD.out
AERMOD Error File: \FID_MULTIPLEBASINS_AERMOD.ERR
Plotfile list _____________
MAX1HRPJT_AREA.PLT
PERIODPJT_AREA.PLT

LIST OF RISK ASSESSMENT FILES
Health risk analysis files (\hra\)
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Con_CancerRisk.csv
Con_CancerRiskSumByRec.csv
Con_GLCList.csv
Con_HRAInput.hra
Con_NCAcuteRisk.csv
Con_NCAcuteRiskSumByRec.csv
Con_NCChronicRisk.csv
Con_NCChronicRiskSumByRec.csv
Con_Output.txt
Con_PathwayRec.csv
Con_PolDB.csv

Spatial averaging files (\sa\)
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**HARP - Air Dispersion Modeling and Risk Tool v22118																		
**10/26/2023																		
**Exported Risk Results																		
REC	GRP	NETID	X	Y	RISK_SUM	SCENARIO	INHAL_RISK	SOIL_RISK	DERMAL_RISK	MMILK_RISK	WATER_RISK	FISH_RISK	CROP_RISK	BEEF_RISK	DAIRY_RISK	PIG_RISK	CHICKEN_RISK	EGG_RISK
4	SENSITIV		241133	4069698	3.8E-11	0.5YrCancerDerived_InhSoilDermMMilk_FAH16to70	3.8E-11	0	0	0	0	0	0	0	0	0	0	0
3	SENSITIV		241931	4069792	9.5825E-11	0.5YrCancerDerived_InhSoilDermMMilk_FAH16to70	9.5825E-11	0	0	0	0	0	0	0	0	0	0	0

5	SENSITIV		240941	4070601	2.3791E-10	0.5YrCancerDerived_InhSoilDermMMilk_FAH16to70	2.3791E-10	0	0	0	0	0	0	0	0	0	0	0
2	SENSITIV		241862	4070663	3.3374E-10	0.5YrCancerDerived_InhSoilDermMMilk_FAH16to70	3.3374E-10	0	0	0	0	0	0	0	0	0	0	0

**HARP - Air Dispersion Modeling and Risk Tool v22118																				
**10/26/2023																				
**Exported Risk Results																				
REC	GRP	NETID	X	Y	SCENARIO	CV	CNS	IMMUN	KIDNEY	GILV	REPRO/DEVEL	RESP	SKIN	EYE	BONE/TEETH	ENDO	BLOOD	ODOR	GENERAL	MAXHI
4	SENSITIV		241133	4069698	NonCancerChronicDerived_InhSoilDermMMilk	0	0	0	0	0	0	7.9396E-08	0	0	0	0	0	0	0	7.9396E-08
3	SENSITIV		241931	4069792	NonCancerChronicDerived_InhSoilDermMMilk	0	0	0	0	0	0	2.0021E-07	0	0	0	0	0	0	0	2.0021E-07

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**HARP - Air Dispersion Modeling and Risk Tool v22118																				
**10/26/2023																				
**Exported Risk Results																				
REC	GRP	NETID	X	Y	SCENARIO	CV	CNS	IMMUN	KIDNEY	GILV	REPRO/DEVEL	RESP	SKIN	EYE	BONE/TEETH	ENDO	BLOOD	ODOR	GENERAL	MAXHI
1	SENSITIV		241257	4070535	NonCancerAcute	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	SENSITIV		241862	4070663	NonCancerAcute	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	SENSITIV		241931	4069792	NonCancerAcute	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	SENSITIV		241133	4069698	NonCancerAcute	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix B: Biological Evaluation

FRESNO IRRIGATION DISTRICT RECHARGE BASIN PHASE II PROJECT BIOLOGICAL EVALUATION

FRESNO COUNTY
DECEMBER 2023

PREPARED FOR:
Fresno Irrigation District
Fresno County

PREPARED BY:
PROVOST & PRITCHARD CONSULTING GROUP
455 W. FIR AVE, CLOVIS, CALIFORNIA 93612

Report Prepared for:
Fresno Irrigation District
2907 S Maple Ave, Fresno, CA 93725

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Laurence Kimura
(559) 233-7161 x 7103

Report Prepared by:
Provost & Pritchard Consulting Group
Preparer: Shaylea Stark, Biologist; Jenny McCarthy, Biologist
Project Manager: Briza Sholars, Senior Planner
QA/QC: Geoff Cline, Principal Biologist
Other personnel involved in report preparation: Ben Toews, GIS Specialist, and Jackie Lancaster, Project Administrator

Contact:
Briza Sholars
(559) 449-2700

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ACRONYMS AND ABBREVIATIONS

APE(s) .... Area of Potential Effect
BMP .... Best Management Practices
CDFW .... California Fish and Wildlife
CEQA .... California Environmental Quality Act
CNDDB .... California Natural Diversity Database
CNPS .... California Native Plant Society
County .... Fresno County
FID .... Fresno Irrigation District
ECOS .... (USFWS) Environmental Conservation Online System
EPA .... Environmental Protection Agency
HUC .... Hydrologic Unit Code
IPaC .... U.S. Fish and Wildlife Service's Information for Planning and Consultation system
MBTA .... Migratory Bird Act
MSL .... Mean Sea Level
NEPA .... National Environmental Policy Act
NRCS .... Natural Resources Conservation Service
Project .... 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
USDA .... United States Department of Agriculture
USFWS .... United States Fish and Wildlife Service
USGS .... United States Geological Survey

1 INTRODUCTION

The following Biological Evaluation report, prepared by Provost & Pritchard Consulting Group (Provost & Pritchard) in compliance with the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA), includes a description of the biological resources present or with potential to occur within the proposed Fresno Irrigation District (FID) Recharge Basin Phase II Project (or "project") and evaluates potential project-related impacts to those resources.

1.1 PROJECT DESCRIPTION

The project consists of the construction of three recharge basins: Krum Basin, Laub Basin, and Crossland Basin. The three basin sites are located in Fresno County within the San Joaquin Valley (see Figure 1 and Figure 2). Each of the proposed basins would connect to existing District infrastructure on or adjacent to the site. The basins will range in size from 20 to 80 acres (154 acres in total). The project's Area of Potential Effect (APE) includes a 50-foot buffer surrounding each APE, which equals approximately 182 acres of the total areas of potential effect. Each basin site would have a basin depth up to 20 feet below ground surface, up to two monitoring wells, a metering stand and flow meter, perimeter fencing/cattle fence, up to two recovery wells, and a discharge pipeline to deliver approximately five cubic feet per second to adjacent existing FID infrastructure (canal or pipeline). The excavation of the basins will be balanced onsite. Specific details that are unique to each recharge basin are outlined below.

1.1.1 KRUM BASIN

The project includes construction of a new 54-acre recharge basin, including earthwork and structures. The Krum Basin APE is approximately 63.5 acres including the additional 50-foot buffer (Figure 3). It is located approximately two miles west of the City of Fresno and seven miles south of the San Joaquin River, southeast of the intersection of McKenzie Avenue and Hayes Avenue. The site is vacant and cleared of vegetation. The project includes a basin outlet structure, abandoning or utilizing two existing wells for monitoring, and removing an underground concrete structure. The basin would connect to Houghton Canal No. 78 to the south.

1.1.2 LAUB BASIN

The project includes construction of a new 80-acre recharge basin, including earthwork and structures. The Laub Basin APE is approximately 93.5 acres including the additional 50-foot buffer (Figure 4). It is located approximately three and a half miles south of the City of Fresno and two miles west of the census-designated place of Easton, southwest of the intersection of American Avenue and Lincoln Avenue. The site is currently used to grow alfalfa but will be cleared of vegetation before project activities begin. The project includes a basin outlet structure that would connect to Central Canal No. 23 to the west.

1.1.3 CROSSLAND BASIN

The project includes construction of a new 20-acre recharge basin, including earthwork and structures. The Crossland Basin APE is approximately 25 acres including the additional 50-foot buffer (Figure 5). It is located approximately one mile east of the City of Fresno and three miles west of the City of Sanger, southeast of the intersection of Butler Avenue and de Wolf Avenue. The northern ten acres of the site have been cleared and the southern ten acres will be cleared prior to construction. The project includes a basin outlet structure that would connect to Hansen Canal No. 29 to the north.

1.2 REPORT OBJECTIVES

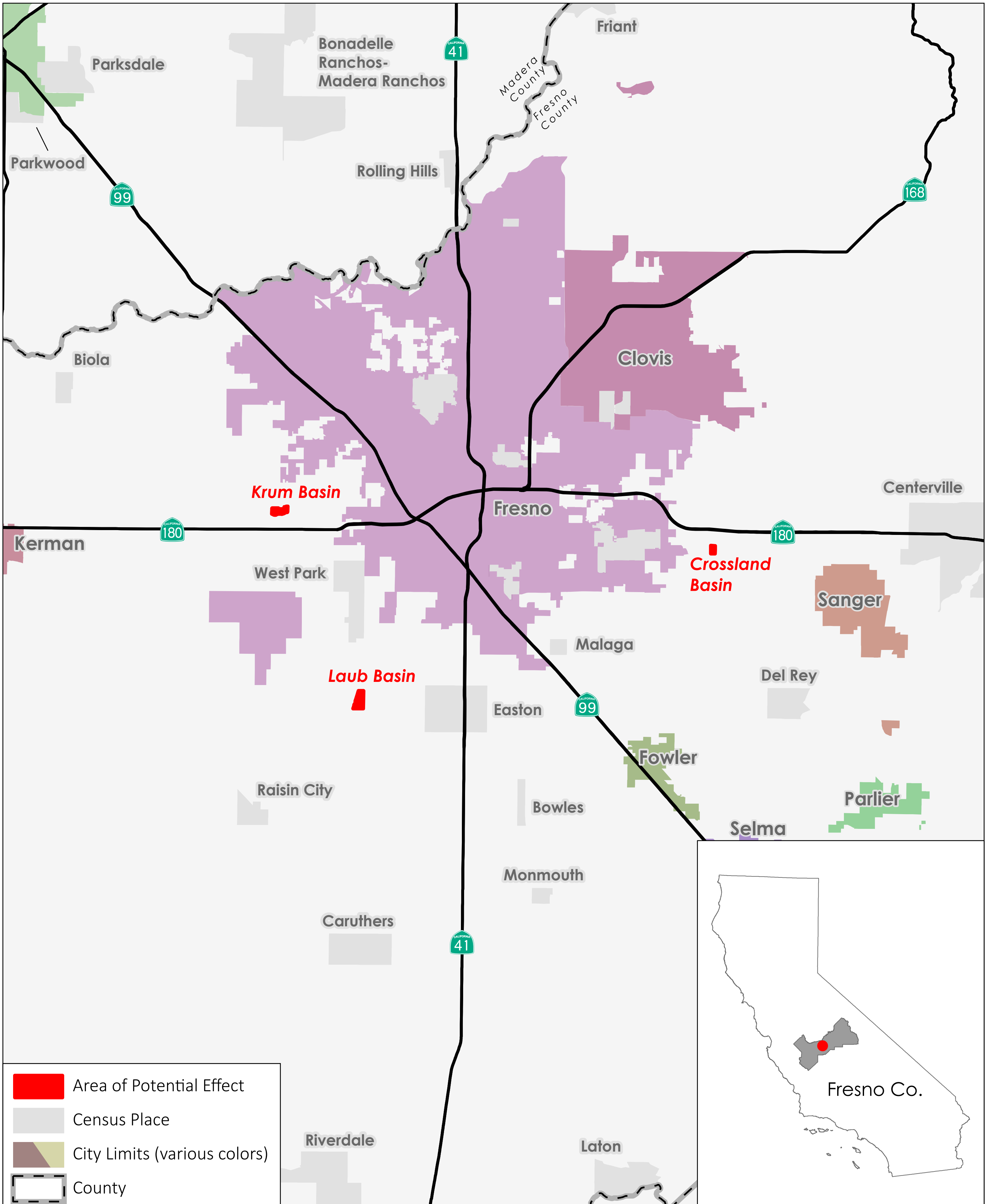
Construction activities such as those proposed by the project could potentially change biological resources or habitats that are crucial for sensitive plant and wildlife species. In cases such as these, development may be regulated by state or federal agencies, and/or addressed by local regulatory agencies.

This report addresses issues related to the following:

- The presence of sensitive biological resources on the APEs, or with the potential to occur on the APEs.
- 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 APE-specific information related to existing biological resources.
- Make reasonable inferences about the biological resources that could occur on the APEs based on habitat suitability and the proximity of the APEs to a species' known range.
- Summarize all state and federal natural resource protection laws that may be relevant to implementation of the project.
- Identify and discuss potential project impacts and effects to biological resources likely to occur onsite within the context of CEQA, NEPA, and/or state or federal laws.
- Identify and prescribe a set of avoidance and mitigation measures that would reduce impacts to a less-than-significant level (as identified by CEQA) or avoid and minimize effects (as identified by NEPA) and are generally consistent with recommendations of the resource agencies for affected biological resources.



0 2 4
Miles

Regional Vicinity Map

Fresno Irrigation District Multiple Basins Project

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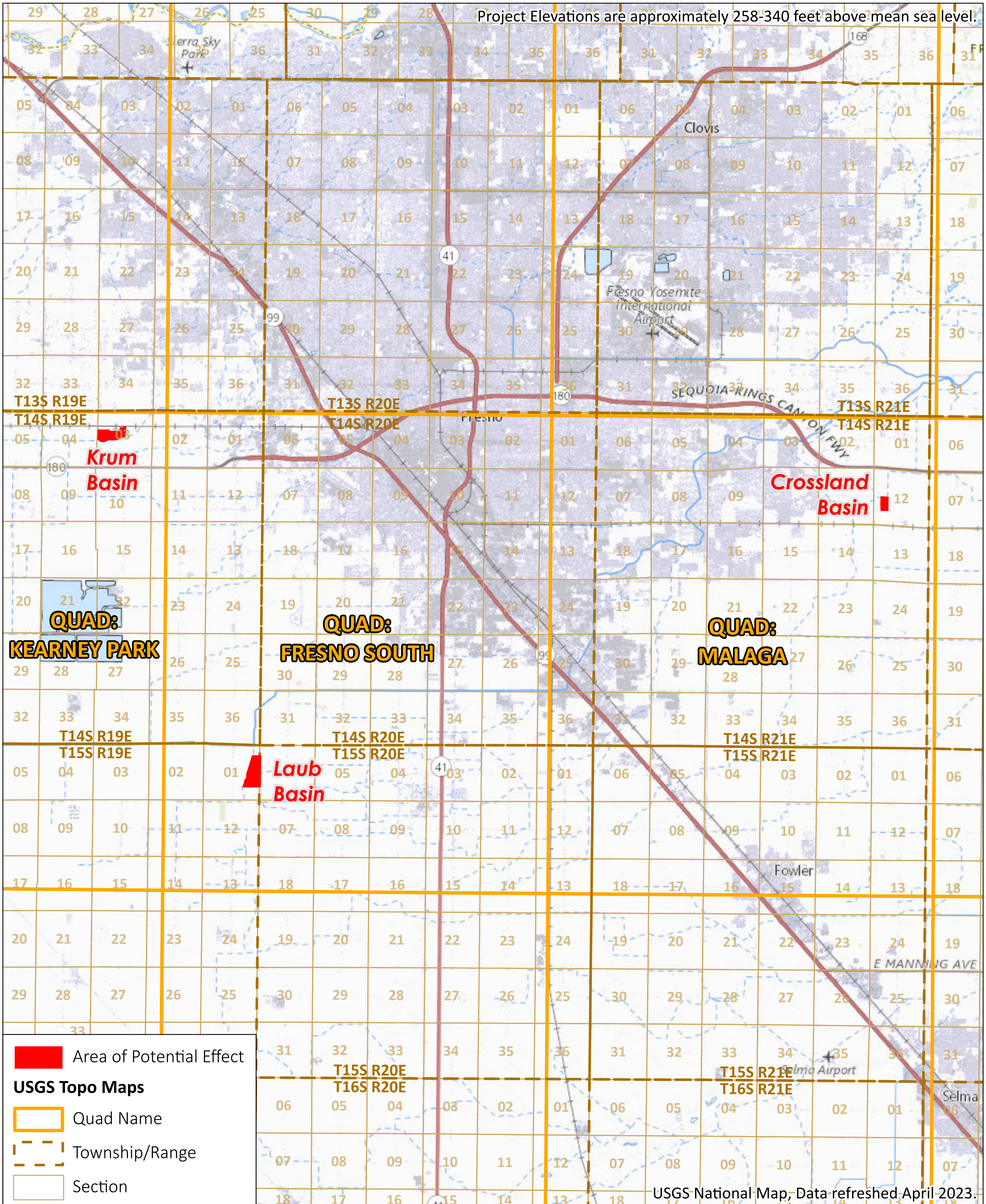
Fig. 1 Page 1-3



0 1 2
Miles

Topographic Map

Fresno Irrigation District Multiple Basins Project

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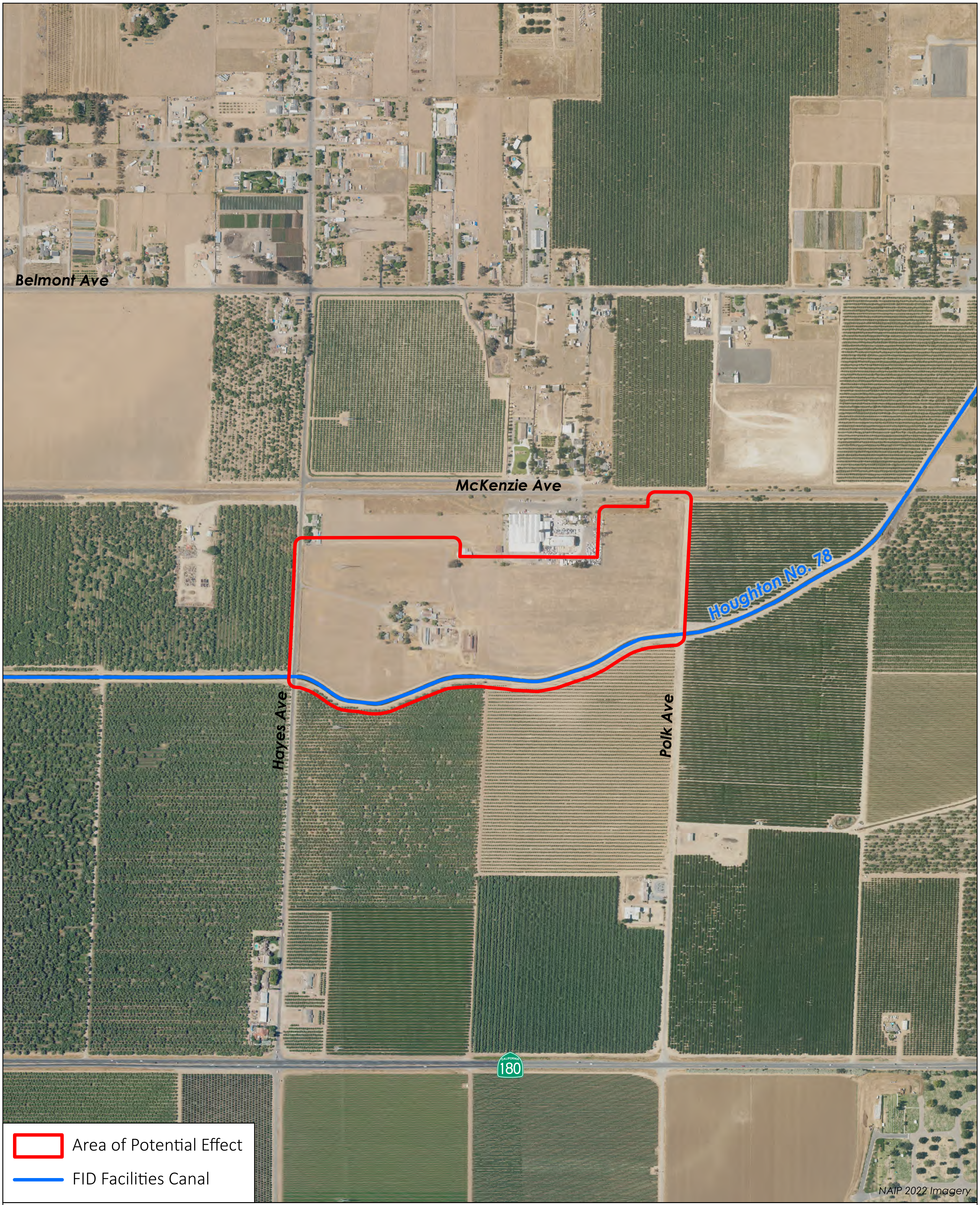
Fig. 2 Page 1-4



Krum Basin Aerial Map

Fresno Irrigation District Multiple Basins Project

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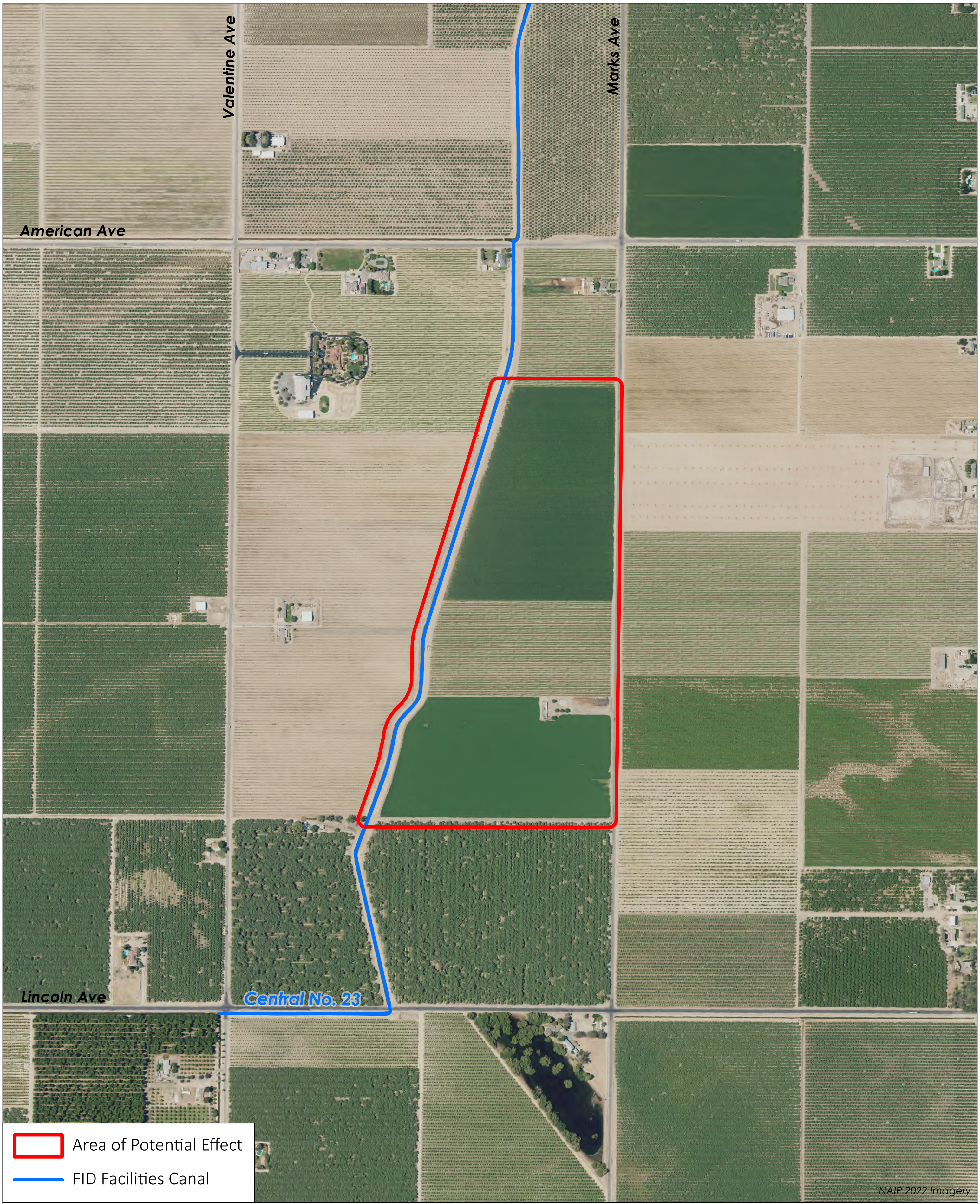
Fig. 3 Page 1-5



Laub Basin Aerial Map

Fresno Irrigation District Multiple Basins Project

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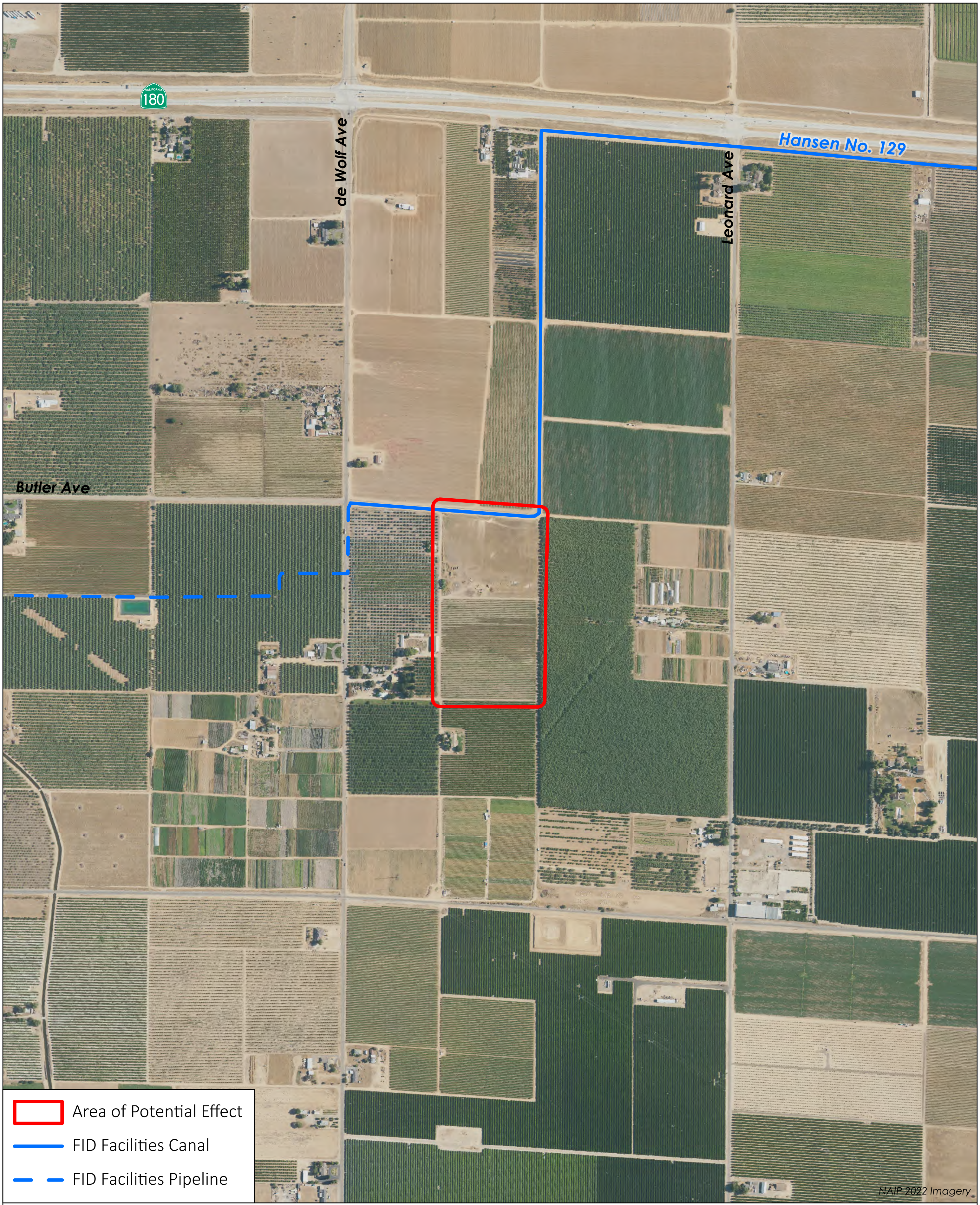
Fig. 4 Page 1-6



0 500 1,000
Feet

Crossland Basin Aerial Map

Fresno Irrigation District Multiple Basins Project

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Fig. 5 Page 1-7

1.3 STUDY METHODOLOGY

A reconnaissance-level field survey of all three APEs was conducted on October 20, 2023, by Provost & Pritchard biologists, Shaylea Stark, and Jenny McCarthy. The survey consisted of walking and driving throughout the sites and visually surveying areas outside of the project sites, while identifying and noting land uses, biological habitats and communities, plant and animal species encountered, and assessing habitats that could be suitable for various rare or protected plant and animal species. Representative photographs of the APEs were taken and are presented in Appendix A- Appendix C.

Ms. Stark and Ms. McCarthy 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 potential to occur within the APEs. Sources of information used in preparation of this analysis included: the California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database (CNDDB; see Appendix D 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 (ECOS), Information for Planning and Consultation (IPaC; see Appendix E for the species list) system, and National Wetlands Inventory (NWI); iNaturalist; NatureServe Explorer's online database; United States Department of Agriculture (USDA) Natural Resources Conservation Service's (NRCS) Web Soil Survey (see Appendix F - Appendix H for the Web Soil Survey Reports); 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 topography of each APE is relatively flat. The elevation for the Krum Basin ranges between 258 and 262 feet above mean sea level (MSL). The elevation for the Laub Basin ranges between 256 and 259 feet above MSL. The elevation for the Crossland Basin ranges between 337 and 340 feet above MSL.

2.1.2 CLIMATE

Like most of California, the Krum Basin, Laub Basin, and Crossland Basin APEs experience a Mediterranean climate. Warm, dry summers are followed by cool, moist winters. In the summer, average high temperatures range between 90- and 99-degrees Fahrenheit (°F), but does not often exceed 105 °F, and the humidity is generally low. Winter temperatures are often below 54°F during the day and rarely exceed 64°F. On average, the City of Fresno receives 12 inches of precipitation in the form of rain yearly, most of which occurs between October and May (WeatherSpark, 2023), and the APEs would be expected to receive similar amounts of precipitation.

2.1.3 HYDROLOGY

The hydrology of each APE is as follows:

- Krum Basin: the nearest surface water is Houghton Canal No. 78 which is located adjacent to the south boundary of the APE.
- Laub Basin: the nearest surface water is Central Canal No. 23, which is located along the west boundary of the APE. An unnamed dirt ditch is also located in the center of the APE, flowing west to east.
- Crossland Basin: the nearest surface water is the Hansen Canal No. 129, which is located within the northern portion of the APE.

2.1.4 SOILS

Ten soil mapping units representing seven soil types were identified within the APEs and are listed in Table 1 (see Appendix F through Appendix H for the Web Soil Survey Reports). The soils are displayed with their core properties in the table below, according to the Major Land Resource Area of California.

Table 1: List of Soils Located on the APEs and Their Basic Properties

APE Basin Name(s)	Soil	Soil Map Unit	Percent of APE	Hydric Soil Category	Drainage	Permeability	Runoff
Krum Basin	*Exeter*	Sandy loam	8.7%	Predominantly Nonhydric	Well drained	Moderately slow	Medium
Krum Basin	*Greenfield*	Sandy loam, 0 to 3 percent slopes	18.5%	Nonhydric	Well drained	Moderately rapid	Very low
Krum Basin	*Madera*	Loam	12.6%,	Predominantly Nonhydric	Moderately well drained	Very slow	Medium

		Clay loam	40.2%	Predominantly Nonhydric	Moderately well drained	Very slow	Medium
Krum Basin	*Ramona*	Loam	0.1%	Nonhydric	Well drained	Moderately slow	Low
Krum Basin	*San Joaquin*	Loam, 0 to 3 percent slopes	20.0%	Predominantly Nonhydric	Moderately well drained	Very slow	High
Crossland Basin		Sandy loam, 0 to 3 percent slopes, MLRA 17	50.6%	Predominantly Nonhydric	Well and moderately well drained	Very slow	Very high
Laub Basin	*Hesperia*	Hesperia fine sandy loam	90.3%	Nonhydric	Well drained	Moderately rapid	Negligible
		Very deep, saline-sodic	9.7%	Nonhydric	Well drained	Moderately rapid	Low
Crossland Basin	*Atwater*	Loam, moderately deep, 0 to 3 percent slopes	49.4%	Nonhydric	Well drained	Moderately rapid	Very low

Hydric soils are defined as soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions such that under sufficiently wet conditions, hydrophytic vegetation can be supported. Soils at the Krum Basin APE are considered nonhydric or predominantly nonhydric. Soils at the Laub Basin APE are considered nonhydric. Soils at the Crossland Basin are considered nonhydric or predominantly nonhydric.

2.2 BIOTIC HABITATS

Three biotic habitats were observed within the APEs and included agricultural, ruderal, and canal/ditch (see Figure 6 - Figure 8). These biotic habitats and their constituent plant and animal species are described in more detail in the following sections. Selected photographs of these habitats are presented in Appendix A - Appendix C.

2.2.1 AGRICULTURAL

The Laub Basin APE consisted of large areas with active agricultural fields planted with alfalfa (*Medicago sativa*). All three APEs contained agricultural fields or orchards within the 50-foot buffer outside of the project sites. While this habitat is regularly disturbed by agricultural activities, disturbance tolerant species would be expected to use this habitat, such as coyote (*Canis latrans*), raccoon (*Procyon lotor*), various bat and bird species, and other species common in this area.

2.2.2 RUDERAL

The majority of the Krum Basin and Crossland Basin APEs included ruderal habitat. The Laub Basin APE also contained large areas of ruderal habitat. The ruderal habitat within these APEs consisted of hard-packed dirt roads and fallow agricultural fields. Vegetation observed in this habitat included invasive grasses, bromes (*Bromus* spp.), sacred datura (*Datura wrightii*), Russian thistle (*Salsola tragus*), sunflower (*Helianthus* sp.), field bindweed (*Convolvulus arvensis*), false daisy (*Eclipta prostrata*), Bermuda grass (*Cynodon dactylon*), horseweed (*Erigeron canadensis),* common cocklebur (*Xanthium orientale),* hairy fleabane (*Erigeron bonariensis),* telegraphweed (*Heterotheca grandiflora),* nettle-leaved goosefoot (*Chenopodiastrum murale*)*,* tree of heaven (*Ailanthus altissima*)*,* puncture vine (*Tribulus terrestis*), and Johnson grass (*Sorghum halepense*).

The survey of the ruderal habitat resulted in the observation of mourning dove (*Zenaida macroura*), white-crowned sparrow (*Zonotrichia leucophrys*), black phoebe (*Sayornis nigricans*), and California scrub jay (*Aphelocoma californica)*. Other species, or their sign, which was detected included western fence lizard (*Sceloporus occidentalis*), coyote scat and tracks, dog (*Canis lupus familiaris*) tracks, and California ground squirrels and their burrows. The Crossland Basin APE also contained cement pipes which could be used by San Joaquin kit fox (*Vulpes marotis mutica*) as atypical dens.

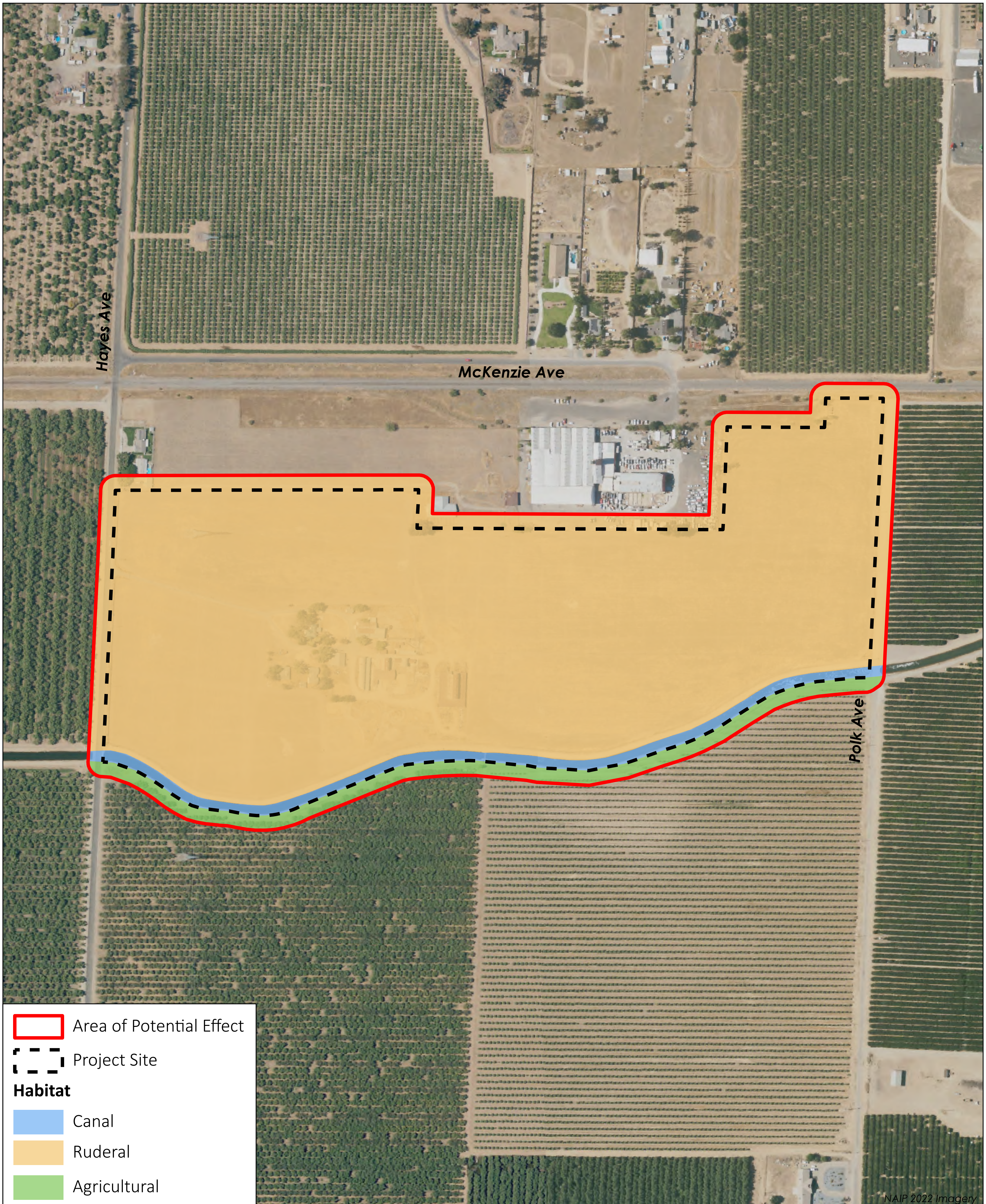
2.2.3 CANAL/DITCH

Within each APE was canal/ditch habitat: Houghton No. 78 canal and a small dirt ditch was located within the Krum Basin APE, Central No. 23 canal was located within the Laub Basin APE, and Hansen Canal No. 129 was located within the Crossland Basin APE. During the field survey the canal/ditch habitat excluding the dirt ditch within the Krum Basin APE was full of water and contained minimal vegetation including young willows (*Salix* sp.), flax leaved horseweed (*Conyza bonariensis*), tall flatsedge (*Cyperus eragrostis*), and sedge (*Carex* sp.) on the canal/ditch edges. Various wildlife that would be found in the agricultural habitat and ruderal habitat would visit the canal/ditch habitat to drink water. Various species may utilize the canal/ditch habitat as a wildlife movement corridor.

2.3 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 CNDDB. According to the CNDDB and the field survey, no natural communities of special concern were present within the APEs or within ten miles of the APEs.

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. No natural waterways or riparian habitat were observed within or adjacent to the APEs.

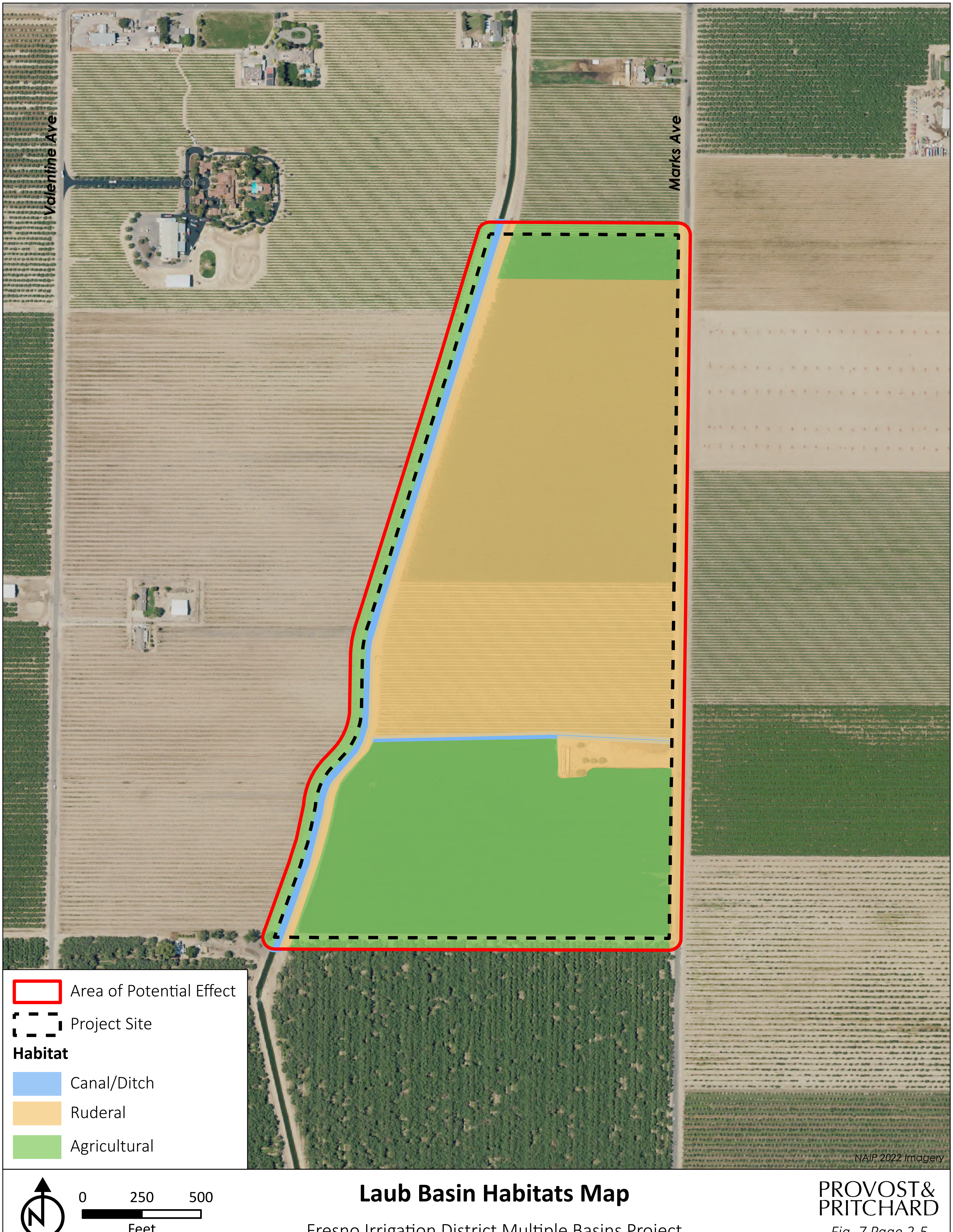


Krum Basin Habitats Map

Fresno Irrigation District Multiple Basins Project

PROVOST& PRITCHARD

Fig. 6 Page 2-4

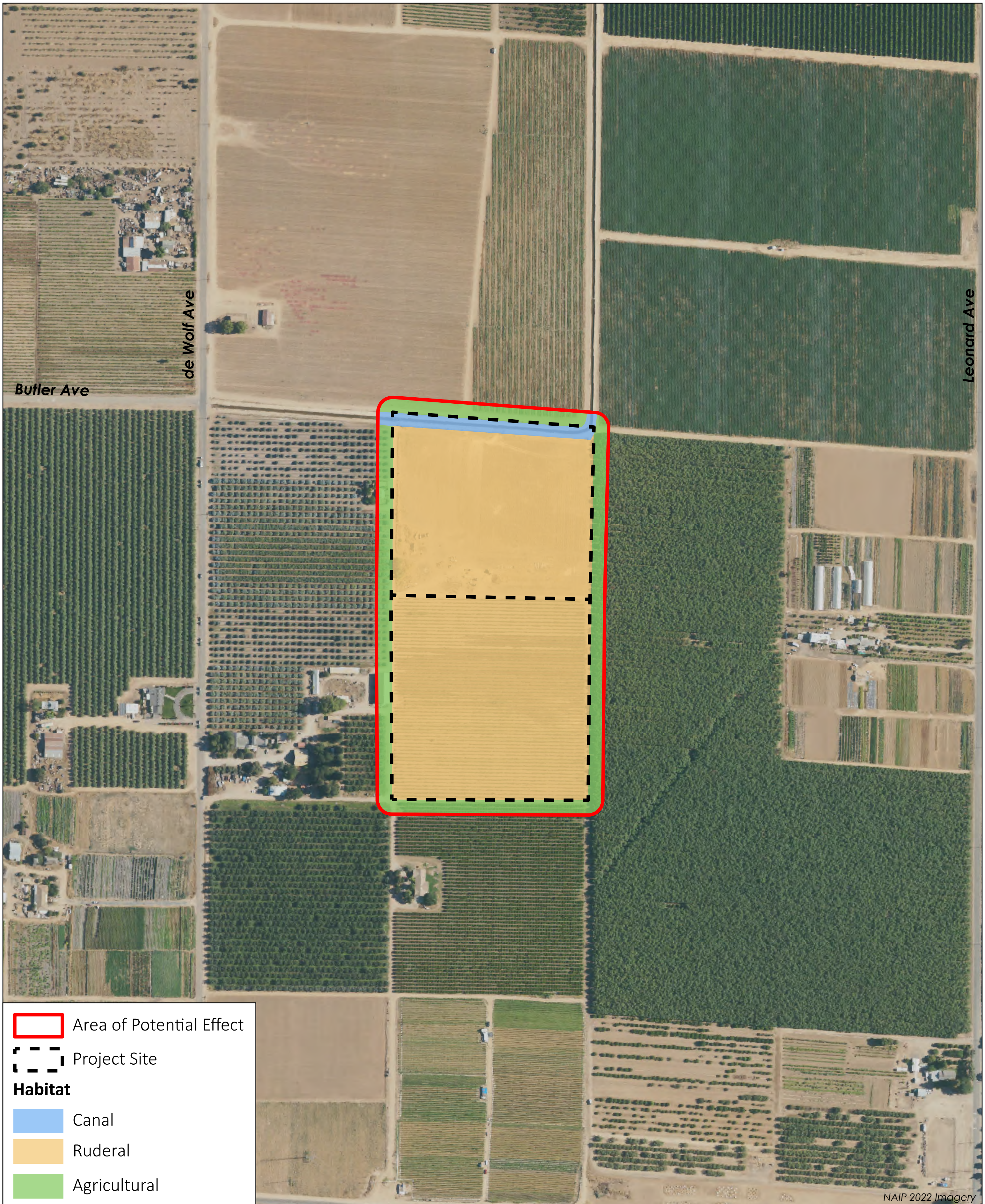


Laub Basin Habitats Map

Fresno Irrigation District Multiple Basins Project

PROVOST&
PRITCHARD

Fig. 7 Page 2-5



Crossland Basin Habitats Map

Fresno Irrigation District Multiple Basins Project

PROVOST&
PRITCHARD

Fig. 8 Page 2-6

2.4 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 is absent from the APEs and vicinity.

2.5 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 APEs contain various canals/ditches that may function as wildlife movement corridors.

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. The Krum Basin APE has suitable features (i.e., an underground concrete structure) that could be used by maternity roosting bats. The Laub and Crossland Basin APEs do not contain areas that would be expected to be used as a native wildlife nursery site.

2.6 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. As the human population grows, urban expansion encroaches on 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 a mechanism for conserving and protecting the diversity of plant and animal species native to California. Numerous native plants and animals have been formally designated as "threatened" or "endangered" under state and federal endangered species legislation. Other formal designations include "candidate" for listing or "species of special concern" by CDFW. The 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 *Fresno South*, *Kearney Park*, and *Malaga* 7.5-minute U.S. Geological Survey (USGS) quadrangles that contain the APEs, and for the 12 surrounding USGS quadrangles: *Biola*, *Caruthers*, *Clovis*, *Conejo*, *Fresno North Helm*, *Herndon*, *Kerman*, *Raisin*, *Round Mountain*, *Sanger*, and *Selma*. A query of the IPaC was also completed for the APEs. These species, and their potential to occur within the APEs, are listed in Table 2 and Table 3 on the following pages. 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 and Appendix D and Appendix E, 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 APEs.

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

Species	Status*	Habitat	Occurrence within the APEs Krum Basin	Laub Basin	Crossland Basin
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.	**Absent.** Vernal pool and wet saline flat habitats were absent within this APE and surrounding areas.	**Absent.** Vernal pool and wet saline flat habitats were absent within this APE and surrounding areas.	**Absent.** Vernal pool and wet saline flat habitats were absent within this APE and surrounding areas.
Bristly sedge (*Carex comosa*)	CNPS 2B	Found in marshes, swamps, coastal prairies, and valley and foothill grasslands, often along lake margins and wet areas at elevations between -16 and 3,310 feet. Areas below sea level occur on a Delta Island. Blooms May – September.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.
Brittlescale (*Atriplex depressa*)	CNPS 1B	Found in the Central Valley in alkaline or clay soils, typically in meadows or annual grasslands at elevations below 1,100 feet. Sometimes associated with vernal pools. Blooms June – October.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.
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.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.
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.	**Unlikely.** While sandy soils were present within this APE, frequent disturbances due to past agricultural use make it unlikely for this species to occur within this APE. The nearest recorded observation of this species within the vicinity was	**Unlikely.** While sandy soils were present within this APE, frequent disturbances due to past and current agricultural use make it unlikely for this species to occur within this APE. The nearest recorded observation of this species within the vicinity was	**Unlikely.** While sandy soils were present within this APE, due to habitat conversion to agricultural fields that were frequently disced, it is unlikely the species could establish within this APE. The nearest recorded observation of this species within the vicinity was

Species	Status*	Habitat	Occurrence within the APEs Krum Basin	Laub Basin	Crossland Basin
			approximately 2 miles east of this APE in 1986.	approximately 4 miles north of this APE in 1986.	approximately 3.5 miles west of this APE in 1986.
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.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.
Forked hare-leaf (*Lagophylla dichotoma*)	CNPS 1B	Found in cismontane woodland, and valley and foothill grassland communities at elevations between 600 and 1,100 feet. Blooms April – May.	**Absent.** Habitat for this species was not observed, and this APE is outside of the elevational range of this species.	**Absent.** Habitat for this species was not observed, and this APE is outside of the elevational range of this species.	**Absent.** Habitat for this species was not observed, and this APE is outside of the elevational range of this species.
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.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.
Hairy Orcutt grass (*Orcuttia pilosa*)	FE, CE, CNPS 1B	Found in vernal pools in valley grassland, wetland, and riparian communities at elevations below 650 feet. Blooms May – September.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.
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.	**Absent.** Suitable habitats, saline, and alkaline soils were absent within this APE.	**Absent.** Suitable habitats, saline, and alkaline soils were absent within this APE.	**Absent.** Suitable habitats, saline, and alkaline soils were absent within this APE.
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	**Absent.** Suitable habitats and alkaline soils were absent within this APE.	**Absent.** Suitable habitats and alkaline soils were absent within this APE.	**Absent.** Suitable habitats and alkaline soils were absent within this APE.

Species	Status*	Habitat	Occurrence within the APEs Krum Basin	Laub Basin	Crossland Basin
		communities at elevations below 750 feet. Blooms April – October.			
Madera leptosiphon (*Leptosiphon serrulatus*)	CNPS 1B	Found within openings of foothill woodland, often yellow-pine forest, and chaparral at elevations between 1,000 and 4,300 feet. Blooms April – May.	**Absent.** This APE is well outside of the elevational range of this species.	**Absent.** This APE is well outside of the elevational range of this species.	**Absent.** This APE is well outside of the elevation range of this species.
Palmate-bracted bird's beak (*Chloropyron palmatum*)	FE, CE, CNPS 1B	Found in the Central Valley in alkaline soils (usually Pescadero silty clay) in chenopod scrub, as well as valley and foothill grassland communities at elevations below 500 feet. Blooms June – August.	**Absent.** Suitable habitats and alkaline soils were absent within this APE.	**Absent.** Suitable habitats and alkaline soils were absent within this APE.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.
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.	**Absent.** Suitable habitats and alkaline soils were absent within this APE.	**Absent.** Suitable habitats and alkaline soils were absent within this APE.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.
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.	**Absent.** This APE is outside of the elevational range of this species.	**Absent.** This APE is outside of the elevational range of this species.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.
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	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.

Species	Status*	Habitat	Occurrence within the APEs Krum Basin	Laub Basin	Crossland Basin
		communities at elevations below 2,600 feet. Blooms April – September.			
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.	**Unlikely.** The canal habitat within this APE was concrete-lined making it unlikely for this species to occur within this APE. The nearest recorded observation of this species within the vicinity was approximately 4 miles north of this APE in 2020.	**Possible.** The canal within this APE was concrete-lined but this species could occur within the dirt ditch present within this APE. The nearest recorded observation of this species within the vicinity was approximately 10.5 miles northwest of this APE in 2020.	**Possible.** This species could occur within the dirt lined canal when it is inundated. The nearest recorded observation of this species within the vicinity was approximately 7 miles northwest of this APE in 1993.
Spiny-sepaled button-celery (*Eryngium spinosepalum*)	CNPS 1B	Found in the Sierra Nevada foothills and the San Joaquin Valley. Occurs 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.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.
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.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.
Succulent owl's-clover (*Castilleja campestris* var. *succulenta*)	FT, CE, CNPS 1B	Found in vernal pools, often in acidic soils at elevations below 2,500 feet. Blooms April – July.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.	**Absent.** Suitable habitat was absent within this APE and surrounding areas.

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

Species	Status*	Habitat	Occurrence within the APEs		
			Krum Basin	Laub Basin	Crossland Basin
American badger (*Taxidea taxus*)	CSSC	Occurs most abundantly in 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.	**Possible.** This species could burrow within the canal banks, or the ruderal habitat of this APE. California ground squirrel burrows were present throughout this APE and could be utilized by this species. This species could also use the canals in the APE as a wildlife movement corridor. The nearest recorded observation of this species within the vicinity was approximately 11.5 miles northeast of this APE in 1987.	**Possible.** This species could burrow within the canal banks, or the ruderal habitat within this APE. This species could also use the canals in the APE as a wildlife movement corridor. The nearest recorded observation of this species within the vicinity was approximately 12 miles northeast of this APE in 1987.	**Possible.** This species could burrow within the canal banks, or the ruderal habitat of this APE. California ground squirrel burrows were present throughout this APE and could be utilized by this species. This species could also use the canals in the APE as a wildlife movement corridor. The nearest recorded observation of this species within the vicinity was approximately 5 miles northwest of this APE in 1987.
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 98 to 2,600 feet. They are absent from areas with steep slopes and dense vegetation, and areas subject to seasonal flooding. Known to bask on kangaroo rat mounds and often seeks shelter at the base of shrubs, in small mammal burrows, or in rock piles. Adults may excavate shallow burrows but rely on deeper pre-existing rodent burrows	**Absent.** While there was loose soil within this APE, this APE and surrounding areas lacked suitable vegetation and prey base for this species.	**Absent.** While there was loose soil within this APE, this APE and surrounding areas lacked suitable vegetation and prey base for this species.	**Absent.** While there was loose soil within this APE, this APE and surrounding areas lacked suitable vegetation and prey base for this species.

Species	Status*	Habitat	Occurrence within the APEs Krum Basin	Laub Basin	Crossland Basin
		for hibernation and reproduction.			
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.** While no sign (i.e., whitewash, feathers, pellets) of this species was observed during the field survey, this species could burrow within the canal banks, or the ruderal habitat. California ground squirrel burrows were present throughout the APE and could be utilized by this species. The nearest recorded observation of this species within the vicinity was approximately 7 miles southwest of this APE in 2005.	**Possible.** While no sign (i.e., whitewash, feathers, pellets) of this species was observed during the field survey, this species could burrow within the canal banks, or the ruderal habitat. The nearest recorded observation of this species within the vicinity was approximately 7 miles west of this APE in 2005.	**Possible**. While no sign (i.e., whitewash, feathers, pellets) of this species was observed during the field survey, this species could burrow within the canal or use one of the many California ground squirrel burrows found within the APE. The nearest recorded observation of this species within the vicinity was approximately 3 miles north of the APE in 1990.
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 expanse 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.** Suitable nesting and foraging habitats were absent within this APE and surrounding areas. This species could fly over this APE but would not be expected to nest or forage within this APE. The CNDDB query resulted in no observations of this species within the regional vicinity of this APE.	**Unlikely.** Suitable nesting and foraging habitats were absent within this APE and surrounding areas. This species could fly over this APE but would not be expected to nest or forage within this APE. The CNDDB query resulted in no observations of this species within the regional vicinity of this APE.	**Unlikely.** Suitable nesting and foraging habitats were absent within this APE and surrounding areas. This species could fly over this APE but would not be expected to nest or forage within the sites. The CNDDB query resulted in no observations of this species within the regional vicinity of this APE.
California glossy snake (*Arizona elegans occidentalis*)	CSSC	Inhabits arid scrub, rocky washes, grasslands, and chaparral. Prefers open areas with loose soil for easy burrowing. This species occurs from the eastern part of the San Francisco Bay Area south to northwestern Baja California but is absent along the central coast.	**Absent.** While loose soils were present within this APE, suitable habitat was absent and past disturbances due to agricultural use make it unlikely for this species to occur within this APE.	**Absent.** While loose soils were present within this APE, suitable habitat was absent and past disturbances due to agricultural use make it unlikely for this species to occur within this APE.	**Absent.** While loose soils were present within this APE, suitable habitat was absent and past disturbances due to agricultural use make it unlikely for this species to occur within this APE.

Species	Status*	Habitat	Occurrence within the APEs Krum Basin	Laub Basin	Crossland Basin
California tiger salamander (*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.	**Absent.** Suitable breeding habitat was absent within this APE and surrounding areas. Furthermore, frequent disturbances due to past agricultural use make it unlikely for this species to occur within this APE.	**Absent.** Suitable breeding habitat was absent within this APE and surrounding areas. Furthermore, frequent disturbances due to past and current agricultural use make it unlikely for this species to occur within this APE.	**Absent**. Suitable breeding habitat was absent within this APE and surrounding areas. Furthermore, frequent disturbances due to past agricultural use make it unlikely for this species to occur within this APE.
Coast horned lizard (*Phrynosoma blainvillii*)	CSSC	Found in grasslands, coniferous forests, woodlands, and chaparral, primarily in open areas with patches of loose, sandy soil and low-lying vegetation in valleys, foothills, and semi-arid mountains. Frequently found near ant hills and along dirt roads in lowlands along sandy washes with scattered shrubs.	**Unlikely.** While loose soils were present within this APE, past agricultural use on the site and existing agricultural fields and residences surrounding the site have likely eliminated this species from occurring within the area and this APE. The nearest recorded observation of this species within the vicinity was approximately 2 miles east of this APE in 1893.	**Unlikely.** While loose soils were present within this APE, past agricultural use on the site and existing agricultural fields and residences surrounding the site have likely eliminated this species from occurring within the area and this APE. The nearest recorded observation of this species within the vicinity was approximately 4 miles north of this APE in 1893.	**Unlikely.** While loose soils were present within this APE, past agricultural use on the site and existing agricultural fields and residences surrounding the site have likely eliminated this species from occurring within the area and this APE. The nearest recorded observation of this species within the vicinity was approximately 5 miles northwest of this APE in 1893.
Crotch 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*.	**Unlikely.** This APE and the surrounding areas have been regularly maintained for irrigation and agricultural purposes and plants this species forages on were absent from this APE. The nearest recorded observation of this species within the vicinity was approximately 2 miles east of this APE in 1899.	**Unlikely.** This APE and the surrounding areas have been regularly maintained for irrigation and agricultural purposes and plants this species forages on were absent from this APE. The nearest recorded observation of this species within the vicinity was approximately 4 miles north of this APE in 1899.	**Unlikely.** This APE and the surrounding areas have been regularly maintained for irrigation and agricultural purposes and plants this species forages on were absent from this APE. The nearest recorded observation of this species within the vicinity was approximately 5 miles northwest of this APE in 1899.
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	**Unlikely.** The habitat requirements needed for the species to forage were not observed within this APE. There were small mammal burrows	**Unlikely.** The habitat requirements needed for the species to forage were not observed within this APE. Frequent disturbances due to	**Unlikely.** The habitat requirements needed for the species to forage were not observed within this APE. There were a few small mammal

Species	Status*	Habitat	Occurrence within the APEs Krum Basin	Laub Basin	Crossland Basin
		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.	within this APE but there was no evidence of kangaroo rat activity (i.e., tail-drag marks). The nearest recorded observation of this species within the vicinity was approximately 2.5 miles northeast of this APE in 1898 but is listed as extirpated.	past and current agricultural use make it unlikely for this species to occur within this APE. The nearest recorded observation of this species within the vicinity was approximately 4 miles southwest of this APE in 1974.	burrows on the dirt road adjacent to the dirt canal but there was no evidence of kangaroo rat activity (i.e., tail-drag marks). The nearest recorded observation of this species within the vicinity was approximately 10.5 miles northwest of this APE in 1898 but is listed as extirpated.
Giant gartersnake (*Thamnophis gigas*)	FT, CT	Occurs in marshes, sloughs, canals, ditches, rice fields, and adjacent uplands. Prefers locations with emergent vegetation for cover and open areas for basking. This species uses small mammal burrows adjacent to aquatic habitats for hibernation in the winter and to escape from excessive heat in the summer.	**Unlikely.** The canal within this APE was concrete-lined and contained minimal to no emergent vegetation. The nearest recorded observation of this species within the vicinity was approximately 17.5 miles southwest of this APE in 1992.	**Unlikely.** The canal within this APE was concrete-lined and contained minimal to no emergent vegetation. The small dirt ditch did not contain suitable habitat for giant gartersnake. The nearest recorded observation of this species within the vicinity was approximately 13.5 miles southwest of this APE in 1992.	**Unlikely.** The dirt canal within this APE did not contain suitable habitat for giant gartersnake. The nearest recorded observation of this species within the vicinity was approximately 25 miles southwest of this APE in 1992.
Least Bell's vireo (*Vireo bellii pusillus*)	FE, CE	This migratory species breeds in southern California. Breeding habitat consists of dense, low, shrubby, riparian vegetation in the vicinity of water or dry river bottoms. By the early 1980s, this species was extirpated from most of its historic range in California, including the Central Valley.	**Unlikely.** Suitable nesting habitat was absent within this APE and surrounding areas. This species could forage over the ruderal field, but it would be expected to fly away during project activities. The nearest recorded observation of this species within the vicinity was approximately 10 miles southwest of this APE in 1912 but is listed as possibly extirpated.	**Unlikely.** Suitable nesting habitat was absent within this APE and surrounding areas. This species could forage over the ruderal field, but it would be expected to fly away during project activities. The nearest recorded observation of this species within the vicinity was approximately 11 miles southwest of this APE in 1912 but is listed as possibly extirpated.	**Unlikely.** Suitable nesting habitat was absent within this APE and surrounding areas. This species could forage over the ruderal field, but it would be expected to fly away during project activities. The nearest recorded observation of this species within the vicinity was approximately 5 miles northwest of this APE in 1912.
Monarch butterfly (*Danaus plexippus*)	FC	Roosts in wind-protected tree groves (eucalyptus, Monterey pine, cypress), with nectar and water sources nearby. Larval	**Unlikely.** Foraging and roosting habitat was absent within this APE. This APE did not contain milkweeds or groves of trees.	**Unlikely.** Foraging and roosting habitat was absent within this APE. This APE did not contain milkweeds or groves of trees.	**Unlikely.** Foraging and roosting habitat was absent within this APE. This APE did not contain milkweeds or groves of trees.

Species	Status*	Habitat	Occurrence within the APEs Krum Basin	Laub Basin	Crossland Basin
		host plants consist of milkweeds (*Asclepias* sp.). Winter roost sites extend along the Pacific coast from northern Mendocino to Baja California, Mexico.	The CNDDB query resulted in no observations of this species within the regional vicinity of the project.	The CNDDB query resulted in no observations of this species within the regional vicinity of the project.	The CNDDB query resulted in no observations of this species within the regional vicinity of the project.
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 loose soils were present within this APE, appropriate leaf litter and vegetation was absent from this APE and frequent disturbances due to past agricultural use make it unlikely for this species to occur within this APE. The nearest recorded observation of this species within the vicinity was approximately 2 miles east of this APE in 1898.	**Unlikely.** While loose soils were present within this APE, appropriate leaf litter and vegetation was absent from this APE and frequent disturbances due to past and current agricultural use make it unlikely for this species to occur within this APE. The nearest recorded observation of this species within the vicinity was approximately 10.5 miles north of this APE in 1898.	**Unlikely.** While loose soils were present within this APE, appropriate leaf litter and vegetation was absent from this APE and frequent disturbances due to past agricultural use make it unlikely for this species to occur within this APE. The nearest recorded observation of this species within the vicinity was approximately 5 miles northwest of this APE in 1880s.
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.** This species could forage over the field or roost in the underground concrete structure located within this APE. The nearest recorded observation of this species within the vicinity was approximately 6.5 miles east of this APE in 1909.	**Unlikely.** Suitable roosting habitat was absent within this APE and surrounding areas. This species could forage in or fly over this APE but would not be expected to roost within this APE or surrounding areas. The nearest recorded observation of this species within the vicinity was approximately 7.5 miles north of this APE in 1909.	**Unlikely.** Suitable roosting habitat was absent within this APE and surrounding areas. This species could forage in or fly over this APE but would not be expected to roost within the APE or surrounding areas. The nearest recorded observation of this species within the vicinity was approximately 7 miles northwest of this APE in 1909.
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.	**Possible.** This species could den within the canal banks, or the ruderal habitat in this APE. California ground squirrel burrows were present throughout this APE and could be utilized by this species. This species could also use the canals	**Possible.** This species could den within the canal banks, or the ruderal habitat in this APE. This species could also use the canals as a wildlife movement corridor. The nearest recorded observation of this species within the vicinity was	**Possible.** This species could den within the dirt canal banks, or the ruderal habitat or use the canals as a wildlife movement corridor. Cement pipes that could be used as atypical dens were observed within this APE. The nearest recorded

Species	Status*	Habitat	Occurrence within the APEs Krum Basin	Laub Basin	Crossland Basin
			as a wildlife movement corridor. The nearest recorded observation of this species within the vicinity was approximately 5 miles north of this APE in 1993.	approximately 10.5 miles southwest of this APE in 1975.	observation of this species within the vicinity was approximately 4 miles southeast of this APE in the 1980's.
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.** Suitable nesting habitat was absent within this APE. This species could forage in the field or nest in the large eucalyptus trees on the adjacent property to the north. The nearest recorded observation of this species within the vicinity was approximately 9 miles southeast of this APE in 2016.	**Possible.** Suitable nesting habitat was absent within this APE. This species could forage in the field or nest in the large eucalyptus trees in the surrounding areas. The nearest recorded observation of this species within the vicinity was approximately 5.5 miles northeast of this APE in 2016.	**Possible.** Suitable nesting habitat was absent within this APE. This species could forage in the field or nest in large trees in the surrounding areas. The nearest recorded observation of this species within the vicinity was approximately 7 miles southwest of this APE in 2016.
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.	**Unlikely.** Suitable nesting habitat was absent within this APE and surrounding areas. This species could forage in the field or fly over this APE but would not be expected to nest within this APE or surrounding areas. The nearest recorded observation of this species within the vicinity was approximately 8.5 miles northeast of this APE in 1975.	**Unlikely.** Suitable nesting habitat was absent within this APE and surrounding areas. This species could forage in the field or fly over this APE but would not be expected to nest within this APE or surrounding areas. The nearest recorded observation of this species within the vicinity was approximately 11.5 miles north of this APE in 1975.	**Unlikely.** Suitable nesting habitat was absent within this APE and surrounding areas. This species could forage in the field or fly over this APE but would not be expected to nest within this APE or surrounding areas. The nearest recorded observation of this species within the vicinity was approximately 6.5 miles northeast of this APE in 2014.
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.** Elderberry shrubs were absent within this APE and surrounding areas and this APE is not located within the Fresno County populations.	**Absent.** Elderberry shrubs were absent within this APE and surrounding areas and this APE is not located within the Fresno County populations.	**Absent.** Elderberry shrubs were absent within this APE and surrounding areas and this APE is not located within the Fresno County populations.
Vernal pool fairy shrimp	FT	Occupies vernal and seasonal pools, with clear to tea-colored	**Absent.** Vernal, seasonal, and basalt depression pools were	**Absent.** Vernal, seasonal, and basalt depression pools were	**Absent.** Vernal, seasonal, and basalt depression pools were

Species	Status*	Habitat	Occurrence within the APEs Krum Basin	Laub Basin	Crossland Basin
(*Branchinecta lynchi*)		water, in grass or mud-bottomed swales, and basalt depression pools.	absent within this APE and surrounding areas.	absent within this APE and surrounding areas.	absent within this APE and surrounding areas.
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.	**Possible.** This species could forage over the field or roost in the underground concrete structure located within this APE. The nearest recorded observation of this species within the vicinity was approximately 2 miles northeast of this APE in 1991.	**Unlikely.** Suitable roosting habitat was absent within this APE and surrounding areas. This species could forage in or fly over this APE but would not be expected to roost within this APE or surrounding areas. The nearest recorded observation of this species within the vicinity was approximately 2.5 miles east of this APE in 1958.	**Unlikely.** Suitable roosting habitat was absent within this APE and surrounding areas. This species could forage in or fly over this APE but would not be expected to roost within this APE or surrounding areas. The nearest recorded observation of this species within the vicinity was approximately 6.5 miles west of this APE in 1991.
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.	**Unlikely.** While canals were present within this APE, basking and nesting habitat was absent within this APE and surrounding areas. The nearest recorded observation of this species within the vicinity was approximately 14 miles northeast of this APE in 2016.	**Unlikely.** While canals were present within this APE, basking and nesting habitat was absent within this APE and surrounding areas. The nearest recorded observation of this species within the vicinity was approximately 16.5 miles northeast of this APE in 2016.	**Unlikely.** While canals were present within this APE, basking and nesting habitat was absent within this APE and surrounding areas. The nearest recorded observation of this species within the vicinity was approximately 9 miles north of this APE in 2016.
Western spadefoot (*Spea hammondii*)	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	**Unlikely.** While canals were present within this APE aquatic vegetation was absent and frequent disturbances due to past agricultural use make it unlikely for this species to occur within this APE. The nearest recorded observation of this species within the vicinity was approximately 9 miles northeast of this APE in 2019.	**Unlikely.** While canals were present within this APE aquatic vegetation was absent and frequent disturbances due to past and current agricultural use make it unlikely for this species to occur within this APE. The nearest recorded observation of this species within the vicinity was approximately 14 miles north of this APE in 2019.	**Unlikely.** While a dirt canal was present within this APE, aquatic vegetation was absent and frequent disturbances due to past agricultural use make it unlikely for this species to occur within this APE. The nearest recorded observation of this species within the vicinity was approximately 9 miles northeast of this APE in 2006.

Species	Status*	Habitat	Occurrence within the APEs Krum Basin	Laub Basin	Crossland Basin
		for a minimum of three weeks, are necessary for breeding.			
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.** Suitable nesting habitat was absent within this APE and surrounding areas. The nearest recorded observation of this species within the vicinity was listed as extirpated.	**Absent.** Suitable nesting habitat was absent within this APE and surrounding areas. The nearest recorded observation of this species within the vicinity was listed as extirpated.	**Absent.** Suitable nesting habitat was absent within this APE and surrounding areas. The nearest recorded observation of this species within the vicinity was listed as extirpated.

*EXPLANATION OF OCCURRENCE DESIGNATIONS AND STATUS CODES

Present:	Species observed on the APEs at time of field surveys or during recent past.
Likely:	Species not observed on the APEs, but it may reasonably be expected to occur there on a regular basis.
Possible:	Species not observed on the APEs, but it could occur there from time to time.
Unlikely:	Species not observed on the APEs, and would not be expected to occur there except, perhaps, as a transient.
Absent:	Species not observed on the APEs 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)
FC	Federal Candidate	CT	California Threatened
FPT	Federally Threatened (Proposed)	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."

3.1.2 NEPA

Federal projects are subject to the provisions of NEPA. The purpose of NEPA is to assess the effects of a proposed action on the human environment, assess the significance of those effects, and recommend measures that if implemented would mitigate those effects. As used in NEPA, a determination that certain effects on the human environment are "significant" requires considerations of both context and intensity (40 Code of Federal Regulations (CFR) 1508.27).

For the purposes of assessing effects of an action on biological resources, the relevant context is often local. The analysis may, however, require a comparison of the action area's biological resources with the biological resources of an entire region. Project activities must have a federal nexus and discuss federally listed species, and/or designated critical habitat that may be affected in the action area.

Federal agencies are required to determine whether their actions may affect listed or proposed species and designated critical habitat. The primary role of this document is to provide agencies conclusion and the rationale to support those conclusions regarding the effects of any proposed actions of the project on protected resources. Document content and recommended elements are identified in 50 CFR 402.12(f).

Under section 7 of the Endangered Species Act, federal agencies must consult with NOAA Fisheries or the USFWS, depending on the species, through an informal or formal consultation when any action the agency carries out, funds, or authorizes may affect either a species listed as threatened or endangered under the Act, or any critical habitat designated for it.

Once resources are assessed an Endangered Species Act Section 7 finding needs to be made regarding proposed or listed species and/or designated critical habitat that may be present in the project area. This report will provide the necessary information for the lead federal agency to make a determination on affects. This finding may result in one of the following determinations:

- *"*No effect*"* - means there will be no impacts, positive or negative, to listed or proposed resources. Generally, this means no listed resources will be exposed to action and its environmental consequences. Concurrence from the Service is not required.
- *"*May affect, but not likely to adversely affect" means that all effects are beneficial, insignificant, or discountable. Beneficial effects have contemporaneous positive effects without any adverse effects to the species or habitat. Insignificant effects relate to the size of the impact and include those effects that are undetectable, not measurable, or cannot be evaluated. Discountable effects are those extremely unlikely to occur. These determinations require written concurrence from the Service.
- *"*May affect, likely to adversely affect" means that listed resources are likely to be exposed to the action or its environmental consequences and will respond in a negative manner to the exposure.

3.2 RELEVANT GOALS, POLICIES, AND LAWS

3.2.1 FRESNO COUNTY GENERAL PLAN

The Fresno County General Plan Policy Document contain the following goals and policies related to the project:

3.2.1.1.1 AGRICULTURE

Goal LU-A: To promote the long-term conservation of productive and potentially- productive agricultural lands and to accommodate agricultural-support services and agriculturally-related activities that support the viability of agriculture and further the County's economic development goals.

Policy LU-A.1: The County shall maintain agriculturally designated areas for agriculture use and shall direct urban growth away from valuable agricultural lands to cities, unincorporated communities, and other areas planned for such development where public facilities and infrastructure are available.

3.2.1.1.2 WATER SUPPLY AND DELIVERY

Goal PF-C: To ensure the availability of an adequate and safe water supply for domestic and agricultural consumption.

Policy PF-C.3: To reduce demand on the county's groundwater resources, the County shall encourage the use of surface water to the maximum extent feasible.

Policy PF-C.4: The County shall support efforts to expand groundwater and/or surface water storage that benefits Fresno County.

3.2.1.1.3 WATER SUPPLY AND DELIVERY

Policy OS-A.13: The County shall encourage, where economically, environmentally, and technically feasible, efforts aimed at directly or indirectly recharging the county's groundwater.

3.2.1.1.4 FISH AND WILDLIFE HABITAT

Goal OS-E: To help protect, restore, and enhance habitats in Fresno County that support fish and wildlife species so that populations are maintained at viable levels.

Policy OS-E.1: The County shall support efforts to avoid the "net" loss of important wildlife habitat where practicable. In cases where habitat loss cannot be avoided, the County shall impose adequate mitigation for the loss of wildlife habitat that is critical to supporting special-status species and/or other valuable or unique wildlife resources. Mitigation shall be at sufficient ratios to replace the function, and value of the habitat that was removed or degraded. Mitigation may be achieved through any combination of creation, restoration, conservation easements, and/or mitigation banking. Conservation easements should include provisions for maintenance and management in perpetuity. The County shall recommend coordination with the US Fish and Wildlife Service and the California Department of Fish and Game to ensure that appropriate mitigation measures and the concerns of these agencies are adequately addressed. Important habitat and habitat components include nesting, breeding, and foraging areas, important spawning grounds, migratory routes, migratory stopover areas, oak woodlands, vernal pools, wildlife movement corridors, and other unique wildlife habitats (e.g., alkali scrub) critical to protecting and sustaining wildlife populations.

Policy OS-E.2: The County shall require adequate buffer zones between construction activities and significant wildlife resources, including both onsite habitats that are purposely avoided and significant habitats that are adjacent to the project site, in order to avoid the degradation and disruption of critical life cycle activities such as breeding and feeding. The width of the buffer zone should vary depending on the location, species, etc. A final determination shall be made based on informal consultation with the US Fish and Wildlife Service and/or the California Department of Fish and Game.

Policy OS-E.3: The County shall require development in areas known to have particular value for wildlife to be carefully planned and, where possible, located so that the value of the habitat for wildlife is maintained.

Policy OS-E.5: The County shall support preservation of habitats of rare, threatened, endangered, and/or other special-status species including fisheries. The County shall consider developing a formal Habitat Conservation Plan in consultation with Federal and State agencies, as well as other resource conservation organizations. Such a plan should provide a mechanism for the acquisition and management of lands that support special-status species.

Policy OS-E.9: Prior to approval of discretionary development permits, the County shall require, as part of any required environmental review process, a biological resources evaluation of the project site by a qualified biologist. The evaluation shall be based upon field reconnaissance performed at the appropriate time of year to determine the presence or absence of significant resources and/or special-status plants or animals. Such evaluation will consider the potential for significant impact on these resources and will either identify feasible mitigation measures or indicate why mitigation is not feasible.

3.2.2 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 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.

3.2.3 DESIGNATED CRITICAL HABITAT

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

3.2.4 MIGRATORY BIRDS

The 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).

3.2.5 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.

3.2.6 NESTING BIRDS

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

3.2.7 WETLANDS AND OTHER "JURISDICTIONAL WATERS"

The definition of "waters of the United States" (WOTUS) often changes from one presidential administration to the next. The current definition, established under the Biden Administration that became effective on March 20, 2023 (i.e. "new 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. Traditional navigable waters, territorial seas, and interstate waters remain covered under the new rule. Natural drainage channels and adjacent wetlands may be considered "waters of the United States" or "jurisdictional waters" subject to the jurisdiction of the USACE based on the "relatively permanent standard," which is defined in the new rule as "relatively permanent, standing or continuously flowing waters connected to paragraph Traditional Navigable Waters, and waters with a continuous surface connection to such relatively permanent waters or to Traditional Navigable Waters. The extent of jurisdiction has been defined in the Code of Federal Regulations 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 new 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 jurisdictional waters. The Supreme Court heard *Sackett v. United States Environmental Protection Agency (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 the State of California ("Waters of the State"). Nine RWQCBs oversee water quality at the local and regional level. The RWQCB for a given region regulates discharges of fill or pollutants into Waters of the State through the issuance of various permits and orders. Discharges into Waters of the State that are also Waters of the United States require a Section 401 Water Quality Certification from the RWQCB as a prerequisite to obtaining certain federal permits, such as a Section 404 Clean Water Act permit. Discharges into all Waters of the State, even those that are not also Waters of the United States, 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 Water of the United States may require a NPDES permit.

CDFW has jurisdiction over the bed and bank of natural drainages and lakes according to provisions of Section 1601 and 1602 of the California Fish and Game Code. Activities that may substantially modify such waters through the diversion or obstruction of their natural flow, change or use of any material from their bed or bank, or the deposition of debris require a notification of 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 measures will be implemented to protect the habitat values of the lake or drainage in question.

3.3 POTENTIALLY SIGNIFICANT PROJECT-RELATED IMPACTS AND MITIGATION

Species protected by California Fish and Game Code, CDFW, USFWS, CEQA, or NEPA that have the potential to be impacted by project activities include: Sanford's arrowhead, American badger, burrowing owl, pallid bat, San Joaquin kit fox, Swainson's hawk, and western mastiff bat. Other sensitive resources that have the potential to be impacted by the project include wildlife movement corridors and native wildlife nursery sites. 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 a violation of state and federal laws or considered a potentially significant impact under CEQA and NEPA. Implementation of the following measures will help reduce potential impacts to these resources to a less than significant level under CEQA and NEPA 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 APEs. 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 APEs, 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 (*BMPs*): The project proponent will ensure that all workers employ the following best management practices (BMPs) in order to avoid and minimize potential impacts to special status species:

- All open structures within the APEs must be filled, covered, or removed from the APEs. Prior to filling, covering, or removing the structures, they must be inspected by a biologist (**see BIO-6**).
- Vehicles will observe a 15-mph speed limit while on unpaved access routes.
- Workers will inspect areas beneath parked vehicles, equipment, and materials prior to mobilization. If special status species are detected, the individual will either be allowed to leave of its own volition or will be captured by the qualified biologist (must possess appropriate collecting/handling permits) and relocated out of harm's way to the nearest suitable habitat beyond the influence of the project work area. "Take" of a state or federal special status (rare, California Species of Special Concern, threatened, or endangered) species is prohibited.
- 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 was the only special status plant species identified to potentially occur within the canal/ditch habitat within the Laub Basin and Crossland Basin APEs. Projects that adversely impact special status plants or result in the mortality of special status plants would be considered a significant impact under CEQA and may be a violation of state laws.

Implementation of the following measures will reduce potential impacts to special status plants to a less than significant level under CEQA will help the project comply with state and federal laws protecting these plant species.

Mitigation measure BIO-2a (*Timing*): The project should conduct activities in the canal/ditch habitat when they are dry.

Mitigation Measure BIO-2b (*Pre-Construction Survey*): Should project activities be required when the canal/ditch habitat is inundated a qualified botanist/biologist will conduct focused botanical surveys within the canal/ditch habitat during the Sanford's arrowhead blooming season (May-October), 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 and prior to the start of construction.

Mitigation Measure BIO-2c (*Avoidance*): If Sanford's arrowhead individuals are identified during a survey, an avoidance buffer and, if necessary, use of exclusion fencing, will be placed around the area as not to disturb the plants or its root system.

Mitigation Measure BIO-2d (*Formal Consultation*): If Sanford's arrowhead individuals or populations or sensitive natural communities are detected within project work areas during the focused botanical survey(s), and the plants cannot be avoided, the project proponent will have a qualified biologist write a relocation plan in consultation with CNPS.

3.3.3 PROJECT-RELATED MORTALITY AND/OR DISTURBANCE TO AMERICAN BADGER

The APEs contain canal banks and ruderal habitat that could potentially be used by American badger. American badgers denning within the APEs during construction have the potential to be injured or killed by project-related activities. Projects that result in the mortality of individuals would be considered a potentially significant impact under CEQA.

Implementation of the following measures will reduce potential impacts to American badgers to a less than significant level under CEQA. The following measures will be implemented prior to the start of construction:

> **Mitigation Measure BIO-3a (*Pre-construction Take Avoidance Survey*):** A qualified biologist will conduct a pre-construction survey of each APE within seven (7) days prior to vegetation clearing or ground disturbing activities. The goal of this survey is to search for potentially active badger dens.
>
> **Mitigation Measure BIO-3b (*Remote Cameras*):** If potential dens for American badger are detected during the pre-construction surveys, each potential den will be monitored with remote cameras for a period of three consecutive nights. If there is no activity at the den location recorded for three consecutive nights, the den can be deemed “inactive” or “unoccupied” and closed or excavated.
>
> **Mitigation Measure BIO-3c (*Den Avoidance*):** If an American badger is denning on or within 50 feet of any APE, the project proponent shall avoid the den by a minimum 50-foot buffer.
>
> **Mitigation Measure BIO-3d (*Eviction and Den Excavation*):** If an American badger is denning on or within 50 feet of any APE and it cannot be avoided, the badger may be evicted, and the den excavated outside of the natal season (generally March 15 – June 15) or if it is determined that there are no cubs in the den. Prior to the planned eviction and den excavation a remote camera will be placed at the den entrance for a minimum of three consecutive nights to record the general time when the badger leaves the den. If it is outside of the natal season or it is determined by a qualified biologist that there are no cubs present in the den the badger will be evicted from the den and the den excavated by hand, with the assistance of machinery, after it has left the den for that night. Should any cubs be discovered during the excavation the work will stop and the crew will leave the site immediately so the female can rescue her cubs and relocate them.

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

The APEs contain canal banks and ruderal habitat that could potentially be used by burrowing owl (BUOW). Construction activities that adversely affect the nesting success of BUOW or result in the mortality of individuals would violate state and federal laws and be considered a significant impact under CEQA and NEPA.

While foraging habitat for BUOW is present on the APEs, suitable foraging habitat is located adjacent to the APEs and within the vicinity of the APEs. Loss of foraging habitat from implementation of the project is not considered a significant impact.

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

> **Mitigation Measure BIO-4a (*Pre-construction Take Avoidance Survey*):** Within seven (7) days prior to the start of construction activities a qualified biologist will conduct a pre-construction take avoidance survey for BUOW and suitable burrows at each APE in accordance with CDFW’s *Staff Report on Burrowing Owl Mitigation* (2012). The surveys shall include the APEs 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 shall be implemented. 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 burrow(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 and all BUOW have left the APE.

Mitigation Measure BIO-4c (*Passive Relocation*): If avoidance of an active BUOW burrow is not feasible, passive relocation may be completed during the non-breeding season (September 1 through January 31) or during the breeding season (February 1 through August 31) if a qualified biologist determines that there are no young in the burrow. Prior to completion a qualified biologist will prepare a passive relocation plan that would detail the methods to be used. It would include the tools to exclude the BUOW from its burrow (i.e., one-way doors or other devices) and excavate the burrow (hand tools and machinery, if needed). Following completion of passive relocation, a report will be prepared that documents the methods and results of these efforts.

3.3.5 PROJECT-RELATED MORTALITY AND/OR NEST ABANDONMENT OF MIGRATORY BIRDS, RAPTORS, AND SPECIAL STATUS BIRDS NCLUDING SWAINSONS HAWK

The APEs contained suitable nesting and foraging habitat for a variety of protected bird species, such as migratory birds, raptors, and special status birds. Birds could nest on the ground within the APEs or in trees adjacent to the APEs. While there are no suitable trees for Swainson’s hawk within the APEs, large trees that are suitable for nesting for this species are located adjacent to the Krum Basin and Crossland Basin APEs, and within the vicinity of the Laub Basin APE. Protected birds located within or adjacent to the APEs during construction have the potential to be injured or killed by project-related activities. In addition to the direct “take” of protected birds within the APEs 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 potentially significant impact under CEQA and NEPA.

While foraging habitat for Swainson’s hawk is present on the APEs, suitable foraging habitat is located adjacent to the APEs and within the vicinity of the APEs. Loss of foraging habitat from implementation of the project is not considered a significant impact.

Implementation of the following measures would reduce potential impacts to protected nesting birds to a less than significant level under CEQA and NEPA and ensure compliance with state and federal laws protecting these avian species.

Mitigation Measure BIO-5a (*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-5b (*Pre-construction Surveys*): If activities must occur within the nesting bird season (February 1 to September 15), a qualified biologist will conduct a single pre-construction take avoidance survey for Swainson’s hawk nests onsite and within a 0.5-mile radius within seven (7) calendar days prior to the start of construction at all APEs. 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. The survey would also include inspecting for nesting migratory birds within and up to 50 feet outside of each APE and for other nesting raptors within up to 450 feet outside of each APE. 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-5c (*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.

3.3.6 PROJECT-RELATED MORTALITY AND/OR DISTURBANCE OF MATERNITY ROOSTING BATS AND SPECIAL STATUS BATS INCLUDING PALLID BAT AND WESTERN MASTIFF BAT

The underground concrete structure located within the Krum Basin APE provides roosting habitat for a variety of bat species, including pallid bats, western mastiff bats, and maternity roosting bats. Maternity roosting bats could use this structure March 1 through August 31, and pallid bats and western mastiff bats could use this structure year-round and would be especially vulnerable during the overwintering season (December 1 through February 28). Should these bats use the underground structure when it is disturbed, closed, or removed, these rare and sensitive roosting bats could be impacted, which would constitute a significant impact under CEQA.

Implementation of the following measures would reduce potential impacts to bats to a less than significant level under CEQA.

Mitigation Measure BIO-6a (*Overwintering Season Avoidance*): Project activities will avoid the concrete structure by at least 150 feet during the overwintering season (December 1 through February 28). Lighting is not to be used near the structure where it would shine on or into a potential roost entrance. Combustion equipment, such as generators, pumps, and vehicles are not to be parked, operated, over or adjacent to the structure.

Mitigation Measure BIO-6b (*Pre-Construction Survey*): From March 1 through November 31, a pre-construction guano and emergence survey will be performed prior to disturbing, closing, or removing the underground structure or working within 150 feet of the structure to identify if there are bats roosting in the structure. A qualified biologist will conduct the survey 2 days or less prior to working on or around the structure.

Mitigation Measure BIO-6c (*Maternity Season Avoidance*): Should an active maternity roost be identified during the pre-construction survey; project activities shall avoid working within 150 feet of the roost until a qualified biologist has determined that the young have been fully reared. Lighting is not to be used near maternity 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, over or adjacent to the maternity roost.

Mitigation Measure BIO-6d (*Eviction*): Should a pallid bat or western mastiff bat roost be observed when the roost is not being used as a maternity or overwintering roost, the bats may be evicted. Prior to completion a qualified biologist will prepare an eviction plan that would detail the methods to be used. It would include the tools to evict the bats from the structure (i.e., one-way doors or other devices) and safely dismantle the roost. Following completion of eviction, a report will be prepared that documents the methods and results of these efforts.

Mitigation Measure BIO-6e (*Deterrence*): If construction is paused for two days or more while removing the underground structure, a qualified biologist will determine what can be used to deter bats from using the structure as a roosting site between construction activities.

3.3.7 PROJECT-RELATED MORTALITY AND/OR DISTURBANCE TO SAN JOAQUIN KIT FOX

The APEs contain suitable denning and foraging habitat for San Joaquin kit fox (SJKF) along the canal banks and within the ruderal habitat. In addition, the Crossland Basin APE contained cement pipes and active California ground squirrel burrows within the APE, that could be used by SJKF. Should SJKF den within the APEs during construction, they have the potential to be injured or killed by project-related activities. Projects that result in the mortality of SJKF would be considered a violation of state and federal laws and considered a significant impact under CEQA and NEPA.

While SJKF may utilize the APEs for foraging, loss of these habitats would not be considered a significant impact to foraging areas for SJKF because similar quality habitats surround each APE and are abundant in the vicinity of each APE. Therefore, no mitigation measures are warranted for loss of SJKF foraging habitat.

Implementation of the following measures will reduce potential impacts to individual SJKF to a less than significant level under CEQA and NEPA and will help comply with state and federal laws protecting this species.

Mitigation Measure BIO-7a (*Pre-Construction Survey*): Within seven (7) days prior to the start of construction a pre-construction survey for SJKF will be conducted on and within 200 feet of each APE.

Mitigation Measure BIO-7b (*Establish Buffers*): On discovery of any SJKF dens near any APE a qualified biologist will determine appropriate construction setback distances (buffer zones) based on applicable USFWS guidelines (see below). If needed, construction buffers will be identified with flagging, fencing, or other easily visible means. They will be maintained until the biologist has determined that the den will no longer be impacted by construction or the SJKF has left.

1. At least 100 feet around den(s);
2. At least 200 feet around natal dens (which SJKF young are reared); and
3. At least 500 feet around any natal dens with pups (except for any portions of the buffer zone that is already fully developed).

Mitigation Measure BIO-7c (*Avoidance and Minimization*): The project will observe all avoidance and minimization measures during construction and on-going operational activities identified in the USFWS's *Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance* (2011), including, but not limited to: maintaining buffer zones and construction speed limits; covering pipes; installing escape structures; restriction of herbicide and rodenticide use; proper disposal of food items and trash; prohibition of pets and firearms; and completion of an employee education program (see **BIO-1a**).

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

All APEs contain canal/ditch habitat. Canals/ditches can function as wildlife movement corridors through highly disturbed areas within the San Joaquin Valley and they can be important resources for various species. Anthropogenic activities would deter wildlife from using these corridors during the day, though these deterrents would likely be absent at night.

The Krum Basin APE has a suitable feature (i.e., underground concrete structure) that could be used by maternity roosting bats, which would be considered a native wildlife nursery site. The potential impacts to maternity roosting bats have been addressed in **Mitigation Measure BIO-6a** through **BIO-6e**. It is unlikely other native species would utilize any other features of the Krum Basin APE or the other two APEs as a wildlife nursery site. Additional mitigation measures are not warranted.

Implementation of the following measures will reduce potential impacts to wildlife movement corridors to a less than significant level under CEQA.

> **Mitigation Measure BIO-8a (*Operational Hours*):** The project's construction activities will occur in the canal/ditch habitat, if feasible, between a half hour after sunrise and a half hour before sunset (i.e. day-time hours) to avoid impacts to wildlife movement corridors.
>
> **Mitigation Measure BIO-8b (*Wildlife Access*):** Should construction activities in the canal/ditch habitat occur between a half hour before sunset and a half hour after sunrise (i.e., night-time hours) each canal/ditch will not be blocked, if feasible, during night-time hours. If construction must block one or both sides of the canal/ditch habitat during night-time hours, an alternative route through the construction area to allow wildlife to move through the area shall be identified by a qualified biologist and maintained throughout the construction schedule timeframe in the canal/ditch habitat.
>
> **Mitigation Measure BIO-8c (*Covers and Inspections*):** Project pipes, culverts, siphons, excavations, and vertical pipes along the canal/ditch habitat will be covered each night to prevent wildlife from falling in or entering and becoming trapped or injured during migratory or dispersal movements. All pipelines, culverts, siphons, excavations, and vertical pipes along the canal/ditch habitat will be inspected for trapped wildlife before moving, burying, or capping.

3.4 SECTION 7 DETERMINATIONS

In addition to the effects analysis performed in Table 2 and Table 3 of this document, Table 4 summarizes project effect determinations for federally- listed species found on the CNDDB list generated on October 20, 2023, and the USFWS IPaC list generated on December 12, 2023 (see Appendix D, and Appendix E, respectively), in accordance with Section 7 of the Endangered Species Act.

Table 4: Section 7 Determinations

Species	Determination	Rationale for Determination
Blunt-nosed leopard lizard (*Gambelia sila*)	No effect	**Habitat absent.** Required habitats were absent within each APE.
California condor *(Gymnogyps californianus)*	No effect	**Habitat absent.** Habitats required by this species for nesting and foraging were absent within each APE.
California jewelflower (*Caulanthus californicus*)	No effect	**Habitat absent.** Habitats required by this species were absent from each APE.

Species	Determination	Rationale for Determination
California tiger salamander *(Ambystoma californiense)*	No effect	**Habitat absent.** Required habitats were absent within each APE.
Fresno kangaroo rat (*Dipodomys nitratoides exilis*)	No effect	**Habitat absent.** Habitats required by this species were absent from each APE.
Giant gartersnake *(Thamnophis gigas)*	No effect	**Habitat absent.** Habitats required by this species were absent from each APE.
Greene's tuctoria *(Tuctoria greenei)*	No effect	**Habitat absent.** Habitats required by this species were absent from each APE.
Hairy Orcutt grass (*Orcuttia pilosa*)	No effect	**Habitat absent.** Habitats required by this species were absent from each APE.
Least Bell's vireo (*Vireo bellii pusillus*)	No effect	**Habitat absent.** Habitats required by this species for nesting are absent from the APEs.
Monarch butterfly (*Danaus plexippus*)	No effect	**Habitat absent**. Foraging and roosting habitat was absent within each APE.
Northwestern pond turtle (*Actinemys marmorata*)	No effect	**Habitat absent**. While canals were present within the APEs, basking and nesting habitat was absent within the APEs and surrounding areas.
Palmate-bracted bird's beak (*Chloropyron palmatum*)	No effect	**Habitat absent.** Habitats and soils required by this species were absent from each APE.
San Joaquin adobe sunburst *(Pseudobahia peirsonii)*	No effect	**Habitat absent.** Habitats required by this species were absent from each APE.
San Joaquin Valley Orcutt grass (*Orcuttia inaequalis*)	No effect	**Habitat absent.** The APEs are outside of the elevational range for this species.
San Joaquin kit fox (*Vulpes macrotis mutica*)	May affect, but not likely to adversely affect	**Potential habitat present.** This species could den within the canal banks or the ruderal habitat within each APE.
Succulent owl's-clover (*Castilleja campestris* var. *succulenta*)	No effect	**Habitat absent.** Habitats required by this species were absent from each APE.
Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)	No effect	**Habitat absent.** This APE is not located within the Fresno County populations.
Vernal pool fairy shrimp (*Branchinecta lynchi*)	No effect	**Habitat absent**. Vernal pool habitat was absent within each APE and surrounding lands.
Western yellow-billed cuckoo (Coccyzus americanus occidentalis)	No effect	**Habitat absent.** Habitats required by this species for nesting was absent within each APE.

3.5 LESS THAN SIGNIFICANT PROJECT-RELATED IMPACTS

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

Of the 20 regionally occurring special status plant species, 19 are considered absent from or unlikely to occur within the APEs due to past or ongoing disturbance and/or the absence of suitable habitat. These species include: alkali-sink goldfields, bristly sedge, brittlescale, California alkali grass, California jewelflower, California satintail, forked hare-leaf, Greene's tuctoria, hairy Orcutt grass, heartscale, lesser saltscale, Madera leptosiphon, palmate-bracted bird's beak, recurved larkspur, San Joaquin adobe sunburst, San Joaquin Valley Orcutt grass, spiny-sepaled button-celery, subtle orache, succulent owl's-clover.

Since it is unlikely that these species would occur onsite, implementation of the project should have no impact on these 19 special status species through construction mortality, disturbance, or loss of habitat. Mitigation measures are not warranted.

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

Of the 23 regionally occurring special status animal species, 17 are considered absent from or unlikely to occur within the APEs due to past or ongoing disturbance and/or the absence of suitable habitat. These species include: blunt-nosed leopard lizard, California condor, California glossy snake, California tiger salamander, coast horned lizard, Crotch bumble bee, Fresno kangaroo rat, giant gartersnake, Least Bell's vireo, monarch butterfly, northern California legless lizard, tricolored blackbird, valley elderberry longhorn beetle, vernal pool fairy shrimp, northwestern pond turtle, 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 17 special status species through construction mortality, disturbance, or loss of habitat. Mitigation measures are not warranted.

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

There are no CNDDB-designated "natural communities of special concern" recorded within the APEs or surrounding lands. Riparian habitat is absent from the APEs and adjacent lands. Mitigation measures are not warranted.

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

Typical wetlands, vernal pools, and other waters were not observed onsite at the time of the biological survey. The only aquatic feature on each APE are canals and a small ditch on the Krum Basin APE. These canals and ditch do not have a connection to navigable waters or a natural drainage channel with a bed or bank, and therefore it can be reasonably assumed that jurisdictional waters are absent. There are no designated wild and scenic rivers within the APEs; therefore, the project would not result in direct impacts to wild and scenic rivers. Mitigation measures are not warranted.

Since construction would involve ground disturbance over an area greater than one acre, the project would also be required 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 (SWPPP) to ensure construction activities do not adversely affect water quality.

3.5.5 PROJECT-RELATED IMPACTS TO CRITICAL HABITAT

Designated critical habitat is absent from the APEs and surrounding lands. Therefore, there would be no impact to critical habitat, and mitigation measures are not warranted.

3.5.6 LOCAL POLICIES OR HABITAT CONSERVATION PLANS

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

3.5.7 COASTAL ZONE AND COASTAL BARRIERS RESOURCES ACT

The project APES are not located within the coastal zone. The project would not impact or be located within or near the Coastal Barrier Resources System or its adjacent wetlands, marshes, estuaries, inlets, and near-shore waters. Mitigation measures are not warranted.

3.5.8 PROJECT-RELATED IMPACT TO ESSENTIAL FISH HABITAT

Essential Fish Habitat (EFH) and Habitat Areas of Particular Concern are absent from the project site and surrounding lands, and consultation with the National Marine Fisheries (NMFS) Service would not be required. Query results of the NMFS EHF Mapper can be found in Appendix I - Appendix K at the end of this document. Mitigation measures are not warranted.

4 REFERENCES

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APPENDIX A: REPRESENTATIVE PHOTOS OF THE KRUM BASIN APE

Photograph 1

Overview of ruderal habitat within this APE.

Photograph 2

Another overview of ruderal habitat within this APE.

Photograph 3

Another overview of ruderal habitat within this APE.

Photograph 4

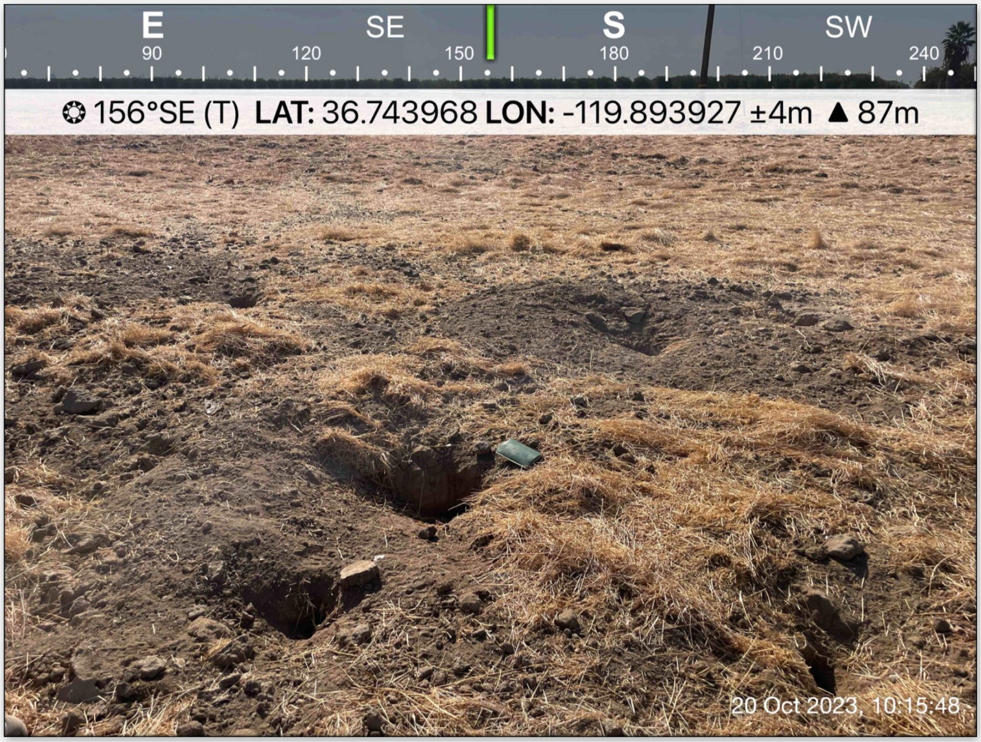
Another overview of ruderal habitat within this APE.

Photograph 5

Overview of large eucalyptus outside of the northern edge of this APE.

Photograph 6

Overview of large trees outside of the northern edge of this APE.



Photograph 7

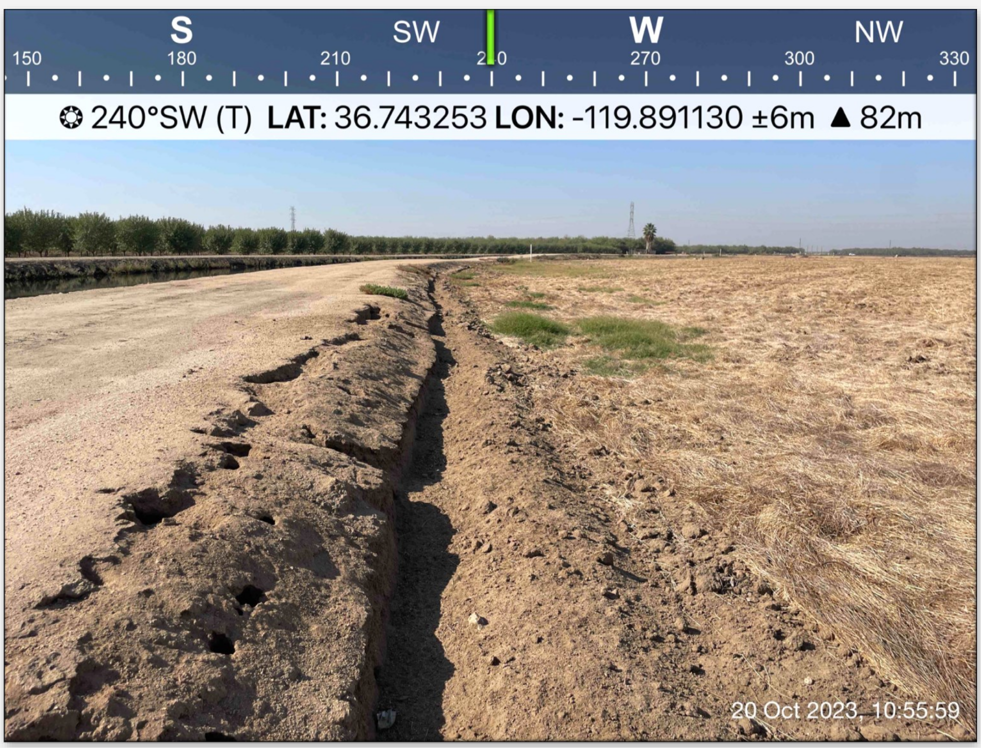
Overview of California ground squirrel burrows within the ruderal field of this APE.

Photograph 8

Overview of California ground squirrel burrows along a fence within the ruderal field of the APE.

Photograph 9

Overview of California ground squirrel burrows along the canal bank within this APE.



Photograph 10

Overview of a wildlife trail along the canal bank within this APE.

Photograph 11

Overview of Houghton Canal No. 78 looking east within this APE.

Photograph 12

Overview of Houghton Canal No. 78 looking west within this APE.

Photograph 13

Overview of an abandoned well within this APE.

Photograph 14

Overview of an abandoned subterranean structure within this APE.

Photograph 15

Surrounding land to the west of this APE consisted of agricultural orchards and the Houghton Canal No. 78.

Photograph 16

Surrounding land to the south of this APE consisted of agricultural orchards.

Photograph 17

Surrounding land to the east of this APE consisted of agricultural orchards and the Houghton Canal No. 78.

Photograph 18

Surrounding land to the north of this APE consisted of a warehouse building.

APPENDIX B: REPRESENTATIVE PHOTOS OF THE LAUB BASIN APE

Photograph 1

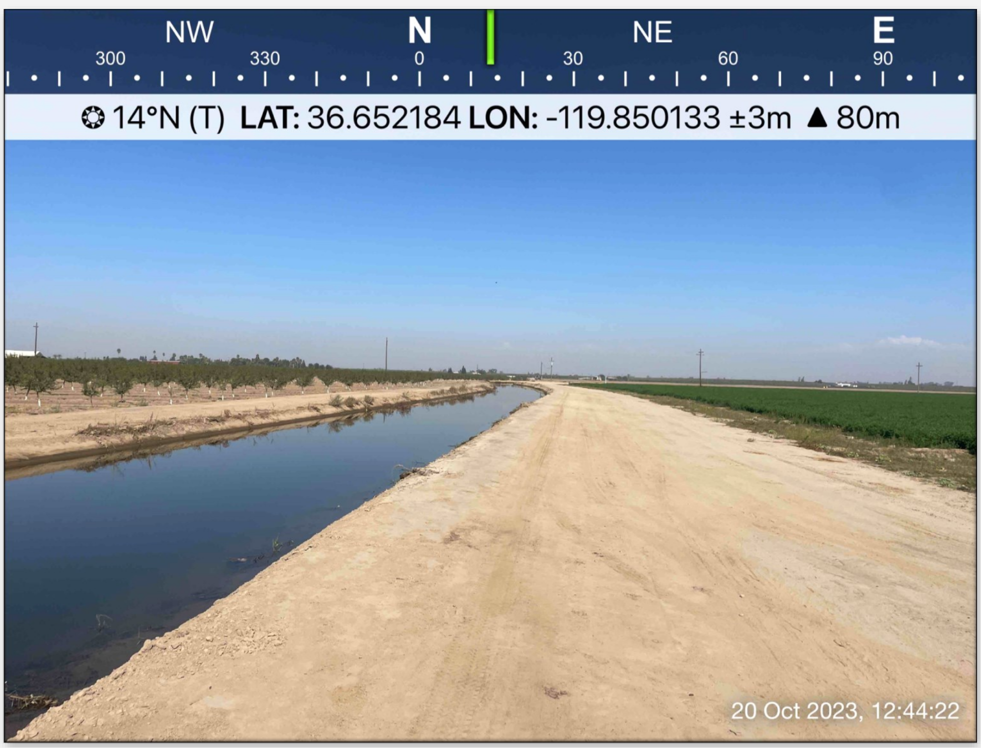
Overview of the northern boundary of this APE, agricultural habitat can be seen.

Photograph 2

Overview of the eastern boundary of this APE, agricultural and ruderal habitat can be seen.

Photograph 3

Overview of the southern boundary of this APE, agricultural and ruderal habitat can be seen.



Photograph 4

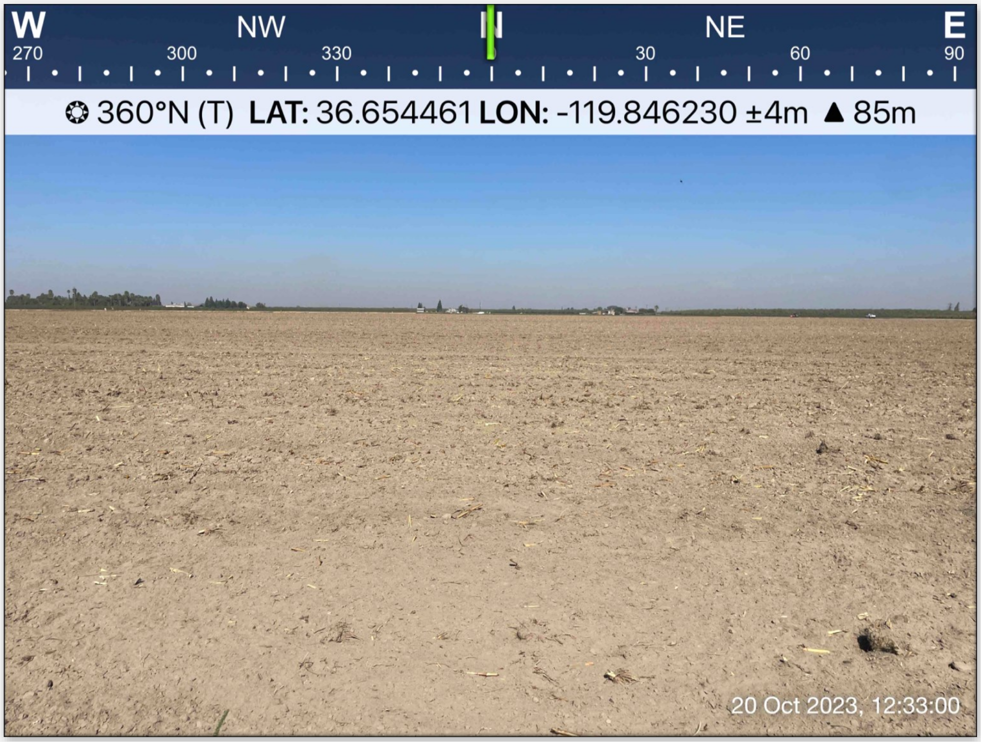
Overview of the western boundary of this APE, canal, ruderal, and agricultural habitat can be seen.

Photograph 5

Overview of agricultural habitat within this APE.

Photograph 6

Overview of ruderal habitat within this APE.



Photograph 7

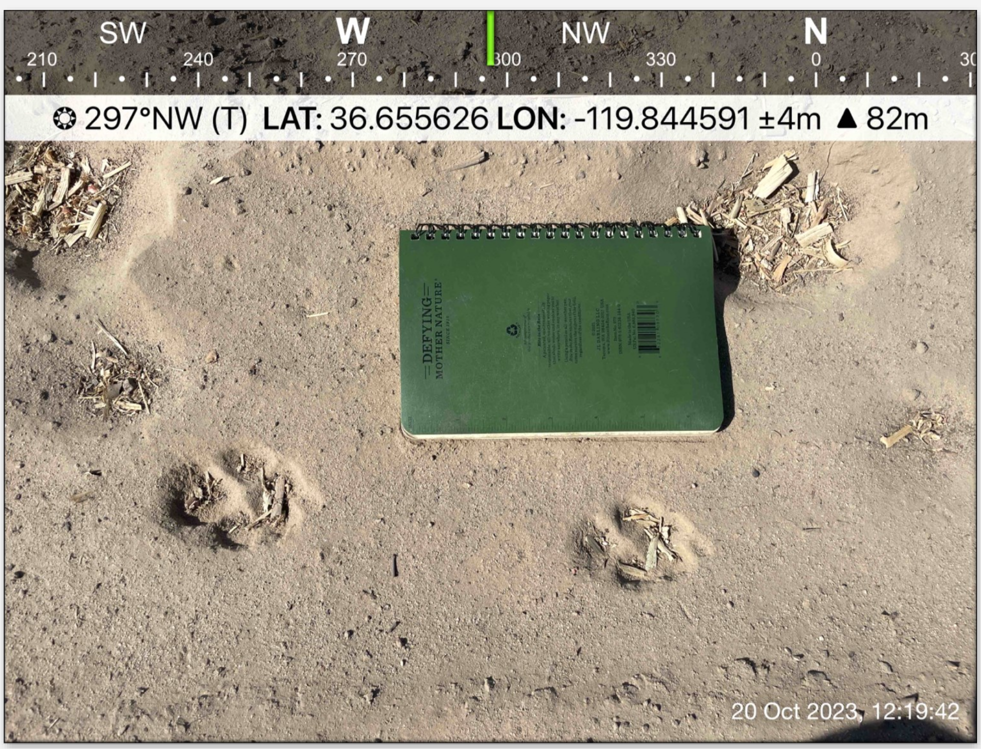
Overview of ruderal habitat within this APE.

Photograph 8

Overview of a dirt ditch running through ruderal habitat within this APE.

Photograph 9

Overview of canal habitat within this APE.



Photograph 10

Overview of dog tracks within the ruderal habitat of this APE.

Photograph 11

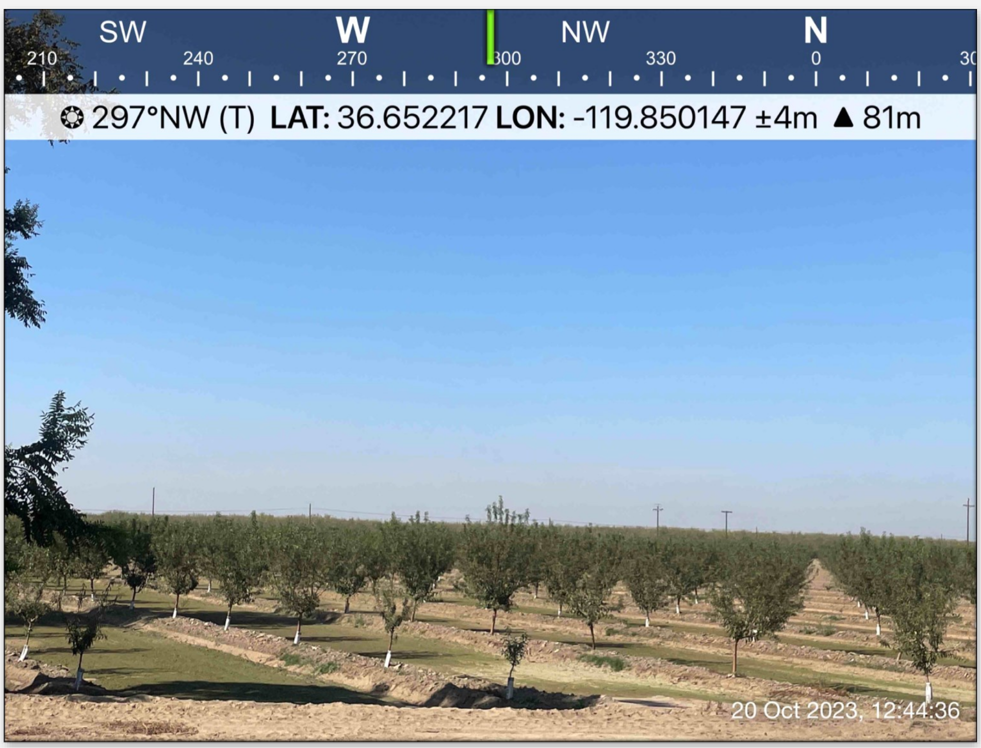
Surrounding land to the north of this APE consisted of agricultural orchards and a residential house.

Photograph 12

Surrounding land to the east of this APE consisted of agricultural vineyards.

Photograph 13

Surrounding land to the south of this APE consisted of agricultural orchards.



Photograph 14

Surrounding land to the west of this APE consisted of agricultural orchards.

APPENDIX C: REPRESENTATIVE PHOTOS OF THE CROSSLAND BASIN APE

Photograph 1

Overview of ruderal habitat within this APE.

Photograph 2

Another overview ruderal habitat within this APE.

Photograph 3

Overview of the Hansen Canal No. 129. This is a dirt canal along the northern boundary of this APE.

Photograph 4

Another overview of the Hansen Canal No. 129.

Photograph 5

Overview of ground squirrel burrows found within this APE.

Photograph 6

Another overview a ground squirrel burrow found within this APE.

Photograph 7

Overview of potential San Joaquin kit fox atypical dens located within this APE.

Photograph 8

Overview of potential San Joaquin kit fox atypical dens located within this APE.

Photograph 9

Overview of non-native vegetation and potential San Joaquin kit fox atypical dens within this APE.

Photograph 10

Overview of a corner of the APE which contains ruderal habitat and orchards.

Photograph 11

Overview of an orchard adjacent to this APE.

Photograph 12

Another overview of an orchard adjacent to this APE.

Photograph 13

Over view of a residential home adjacent to this APE.

Photograph 14

Overview of an orchard adjacent to this APE.

APPENDIX D: ALL BASINS CNDDB 15-QUAD SPECIES LIST

Selected Elements by Common Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Biola (3612071) OR Herndon (3611978) OR Fresno North (3611977) OR Fresno South (3611967) OR Clovis (3611976) OR Round Mountain (3611975) OR Sanger (3611965) OR Malaga (3611966) OR Kearney Park (3611968) OR Kerman (3612061) OR Helm (3612051) OR Raisin (3611958) OR Caruthers (3611957) OR Conejo (3611956) OR Selma (3611955))

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	
Antioch efferian robberfly *Efferia antiochi*	IIDIP07010	None	None	G1G2	S1S2	
black-crowned night heron *Nycticorax nycticorax*	ABNGA11010	None	None	G5	S4	
bristly sedge *Carex comosa*	PMCYP032Y0	None	None	G5	S2	2B.1
brittlescale *Atriplex depressa*	PDCHE042L0	None	None	G2	S2	1B.2
burrowing owl *Athene cunicularia*	ABNSB10010	None	None	G4	S2	SSC
California alkali grass *Puccinellia simplex*	PMPOA53110	None	None	G2	S2	1B.2
California glossy snake *Arizona elegans occidentalis*	ARADB01017	None	None	G5T2	S2	SSC
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
coast horned lizard *Phrynosoma blainvillii*	ARACF12100	None	None	G4	S4	SSC
Crotch bumble bee *Bombus crotchii*	IIHYM24480	None	Candidate Endangered	G2	S2	
double-crested cormorant *Nannopterum auritum*	ABNFD01020	None	None	G5	S4	WL
forked hare-leaf *Lagophylla dichotoma*	PDAST5J070	None	None	G2	S2	1B.1

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Fresno kangaroo rat *Dipodomys nitratoides exilis*	AMAFD03151	Endangered	Endangered	G3TH	SH	
giant gartersnake *Thamnophis gigas*	ARADB36150	Threatened	Threatened	G2	S2	
great egret *Ardea alba*	ABNGA04040	None	None	G5	S4	
Greene's tuctoria *Tuctoria greenei*	PMPOA6N010	Endangered	Rare	G1	S1	1B.1
hairy Orcutt grass *Orcuttia pilosa*	PMPOA4G040	Endangered	Endangered	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 eriastrum *Eriastrum hooveri*	PDPLM03070	Delisted	None	G3	S3	4.2
Hurd's metapogon robberfly *Metapogon hurdi*	IIDIP08010	None	None	G1G2	S1S2	
least Bell's vireo *Vireo bellii pusillus*	ABPBW01114	Endangered	Endangered	G5T2	S3	
lesser saltscale *Atriplex minuscula*	PDCHE042M0	None	None	G2	S2	1B.1
Madera leptosiphon *Leptosiphon serrulatus*	PDPLM09130	None	None	G3	S3	1B.2
midvalley fairy shrimp *Branchinecta mesovallensis*	ICBRA03150	None	None	G2	S2S3	
molestan blister beetle *Lytta molesta*	IICOL4C030	None	None	G2	S2	
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	
pallid bat *Antrozous pallidus*	AMACC10010	None	None	G4	S3	SSC
palmate-bracted bird's-beak *Chloropyron palmatum*	PDSCR0J0J0	Endangered	Endangered	G1	S1	1B.1
recurved larkspur *Delphinium recurvatum*	PDRAN0B1J0	None	None	G2?	S2?	1B.2
San Joaquin adobe sunburst *Pseudobahia peirsonii*	PDAST7P030	Threatened	Endangered	G1	S1	1B.1

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
San Joaquin kit fox *Vulpes macrotis mutica*	AMAJA03041	Endangered	Threatened	G4T2	S3	
San Joaquin pocket mouse *Perognathus inornatus*	AMAFD01060	None	None	G2G3	S2S3	
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
snowy egret *Egretta thula*	ABNGA06030	None	None	G5	S4	
spiny-sepaled button-celery *Eryngium spinosepalum*	PDAPI0Z0Y0	None	None	G2	S2	1B.2
subtle orache *Atriplex subtilis*	PDCHE042T0	None	None	G1	S1	1B.2
succulent owl's-clover *Castilleja campestris var. succulenta*	PDSCR0D3Z1	Threatened	Endangered	G4?T2T3	S2S3	1B.2
Swainson's hawk *Buteo swainsoni*	ABNKC19070	None	Threatened	G5	S4	
tricolored blackbird *Agelaius tricolor*	ABPBXB0020	None	Threatened	G1G2	S2	SSC
valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	IICOL48011	Threatened	None	G3T3	S3	
vernal pool fairy shrimp *Branchinecta lynchi*	ICBRA03030	Threatened	None	G3	S3	
western mastiff bat *Eumops perotis californicus*	AMACD02011	None	None	G4G5T4	S3S4	SSC
western pond turtle *Emys marmorata*	ARAAD02030	None	None	G3G4	S3	SSC
western spadefoot *Spea hammondii*	AAABF02020	None	None	G2G3	S3S4	SSC
western yellow-billed cuckoo *Coccyzus americanus occidentalis*	ABNRB02022	Threatened	Endangered	G5T2T3	S1	

Record Count: 55

APPENDIX E: ALL BASINS 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: December 12, 2023
Project Code: 2024-0007226
Project Name: FID Multiple Recharge Basin 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 IPaC 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 Migratory Bird Permit | What We Do | U.S. Fish & Wildlife Service (fws.gov).

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".

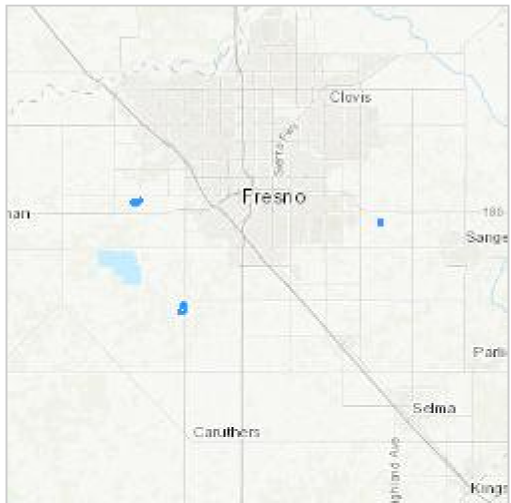
This species list is provided by:

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

PROJECT SUMMARY

Project Code: 2024-0007226
Project Name: FID Multiple Recharge Basin Project
Project Type: Water Supply Facility - New Constr
Project Description: FID proposes to build new recharge basins on three separate properties.
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@36.7441163,-119.89390693303012,14z



Counties: Fresno County, California

ENDANGERED SPECIES ACT SPECIES

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

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

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

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

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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
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
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

BIRDS

NAME	STATUS
California Condor *Gymnogyps californianus* Population: U.S.A. only, 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
Yellow-billed Cuckoo *Coccyzus americanus* Population: Western U.S. DPS There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened

REPTILES

NAME	STATUS
Blunt-nosed Leopard Lizard *Gambelia silus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/625	Endangered
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 does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2076	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
Vernal Pool Fairy Shrimp *Branchinecta lynchi* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/498	Threatened

CRITICAL HABITATS

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

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

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 F: KRUM BASIN APE NRCS WEB SOIL SURVEY REPORT

United States Department of Agriculture

NRCS

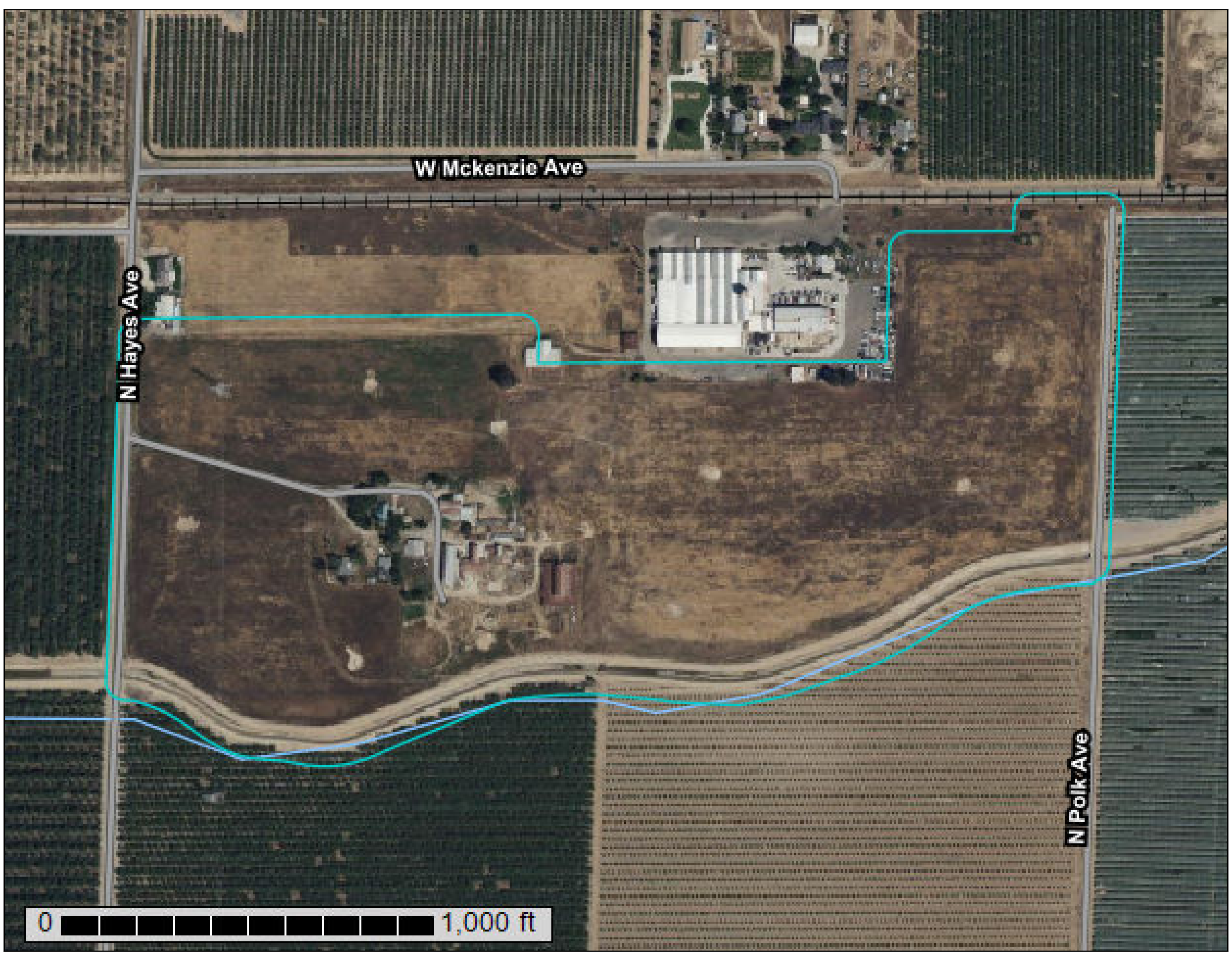
Natural Resources Conservation Service

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

Eastern Fresno Area, California

Krum Basin APE



October 25, 2023

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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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

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

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map

Map Scale: 1:4,590 if printed on A landscape (11" x 8.5") sheet.

Meters: 0, 50, 100, 200, 300

Feet: 0, 200, 400, 800, 1200

N

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Eastern Fresno Area, California
Survey Area Data: Version 16, Aug 31, 2023

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

Date(s) aerial images were photographed: Mar 16, 2022—May 30, 2022

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
Es	Exeter sandy loam	5.5	8.7%
GtA	Greenfield sandy loam, 0 to 3 percent slopes	11.7	18.5%
Mc	Madera loam	8.0	12.6%
Me	Madera clay loam	25.6	40.2%
Rc	Ramona loam	0.0	0.1%
SeA	San Joaquin loam, 0 to 3 percent slopes	12.7	20.0%
Totals for Area of Interest		**63.5**	**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.

Eastern Fresno Area, California

Es—Exeter sandy loam

Map Unit Setting

National map unit symbol: hl3t
Elevation: 200 to 450 feet
Mean annual precipitation: 9 to 14 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 225 to 275 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Exeter

Setting

Landform: Stream terraces
Landform position (two-dimensional): Footslope
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 15 inches: sandy loam
Bt - 15 to 30 inches: sandy loam
Bqm - 30 to 40 inches: cemented

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to duripan
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.01 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): 4s
Hydrologic Soil Group: C
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Minor Components

Unnamed

Percent of map unit: 14 percent
Landform: Stream terraces

Hydric soil rating: No

Unnamed, ponded

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

GtA—Greenfield sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: hl58
Elevation: 250 to 500 feet
Mean annual precipitation: 9 to 17 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 200 to 275 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

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

Description of Greenfield

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 granite

Typical profile

Ap - 0 to 16 inches: sandy loam
Bt - 16 to 38 inches: sandy loam
C - 38 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 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
Available water supply, 0 to 60 inches: Moderate (about 8.0 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

Hanford

Percent of map unit: 8 percent
Landform: Alluvial fans
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Ramona

Percent of map unit: 7 percent
Landform: Alluvial fans
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Mc—Madera loam

Map Unit Setting

National map unit symbol: hl6w
Elevation: 250 to 500 feet
Mean annual precipitation: 9 to 15 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 250 to 275 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Madera

Setting

Landform: Erosion remnants on terraces
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Side slope, tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

Ap - 0 to 20 inches: loam
Bt - 20 to 33 inches: clay
Bkqm - 33 to 43 inches: cemented

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: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.01 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 3.0 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Ecological site: R017XE113CA - TERRACE 12-14"
Hydric soil rating: No

Minor Components

Unnamed, deep to hardpan

Percent of map unit: 14 percent
Landform: Erosion remnants on terraces
Hydric soil rating: No

Unnamed, ponded

Percent of map unit: 1 percent
Landform: Depressions on erosion remnants on terraces
Hydric soil rating: Yes

Me—Madera clay loam

Map Unit Setting

National map unit symbol: hl6y
Elevation: 250 to 500 feet
Mean annual precipitation: 9 to 15 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 250 to 275 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Madera

Setting

Landform: Erosion remnants on terraces
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Side slope, tread

Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

Ap - 0 to 20 inches: clay loam
Bt - 20 to 33 inches: clay
Bkqm - 33 to 43 inches: cemented

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: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.01 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 3.0 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Ecological site: R017XE113CA - TERRACE 12-14"
Hydric soil rating: No

Minor Components

Unnamed, hard, silty substratum

Percent of map unit: 14 percent
Landform: Erosion remnants on terraces
Hydric soil rating: No

Unnamed, ponded

Percent of map unit: 1 percent
Landform: Depressions on erosion remnants on terraces
Hydric soil rating: Yes

Rc—Ramona loam

Map Unit Setting

National map unit symbol: hl8m
Elevation: 250 to 500 feet
Mean annual precipitation: 9 to 15 inches
Mean annual air temperature: 60 to 62 degrees F
Frost-free period: 225 to 275 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

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

Description of Ramona

Setting

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

Typical profile

A - 0 to 12 inches: loam
BAt - 12 to 24 inches: loam
Bt - 24 to 38 inches: clay loam
C - 38 to 60 inches: coarse sandy 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 (0.20 to 0.57 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 5.5 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

Unnamed, fine sandy loam

Percent of map unit: 10 percent
Landform: Stream terraces, alluvial fans
Hydric soil rating: No

Unnamed, clay loam

Percent of map unit: 5 percent
Landform: Stream terraces, alluvial fans
Hydric soil rating: No

Unnamed, gently sloping

Percent of map unit: 5 percent
Landform: Stream terraces, alluvial fans
Hydric soil rating: No

SeA—San Joaquin loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: hl93
Elevation: 250 to 500 feet
Mean annual precipitation: 9 to 15 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 250 to 275 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 granite

Typical profile

A - 0 to 16 inches: loam
Bt1 - 16 to 28 inches: sandy clay loam
2Bt2 - 28 to 29 inches: clay
2Bqm - 29 to 36 inches: cemented
2C - 36 to 60 inches: coarse sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 24 to 48 inches to duripan
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 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 4.5 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Ecological site: R017XE113CA - TERRACE 12-14"
Hydric soil rating: No

Minor Components

Unnamed, fine sandy loam
Percent of map unit: 6 percent
Landform: Fan remnants
Hydric soil rating: No

Unnamed, moderately sloping
Percent of map unit: 6 percent
Landform: Fan remnants
Hydric soil rating: No

Unnamed, ponded
Percent of map unit: 3 percent
Landform: Depressions on fan remnants
Hydric soil rating: Yes

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APPENDIX G: LAUB BASIN APE NRCS WEB SOIL SURVEY REPORT

United States Department of Agriculture

NRCS

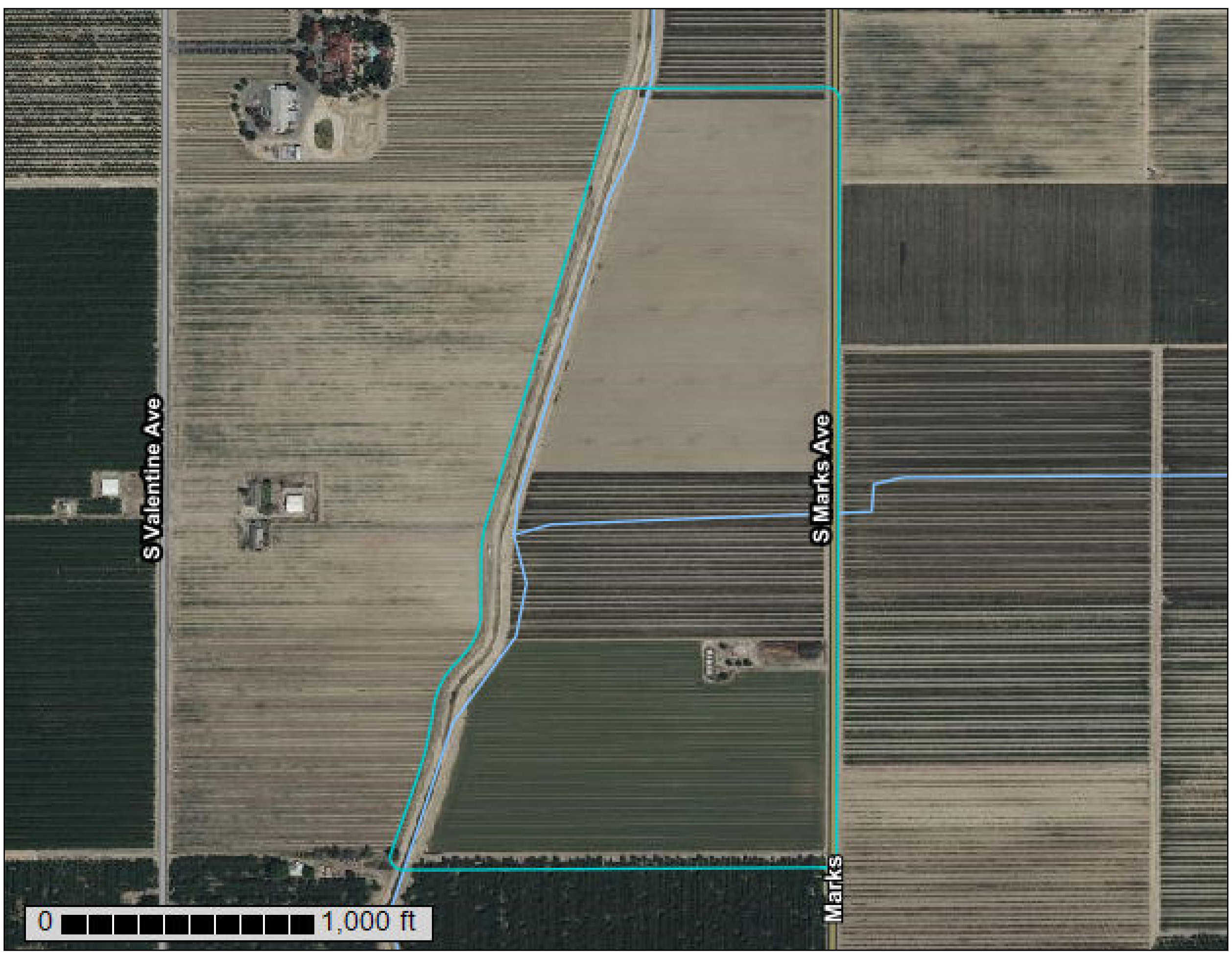
Natural Resources Conservation Service

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

Eastern Fresno Area, California

Laub APE Soil Map



October 25, 2023

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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alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

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

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map

Map Scale: 1:5,490 if printed on A portrait (8.5" x 11") sheet.

Meters: 0, 50, 100, 200, 300

Feet: 0, 250, 500, 1000, 1500

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Eastern Fresno Area, California
Survey Area Data: Version 16, Aug 31, 2023

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

Date(s) aerial images were photographed: Mar 16, 2022—May 30, 2022

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
Hsr	Hesperia fine sandy loam, very deep	84.4	90.3%
Hss	Hesperia fine sandy loam, very deep, saline-sodic	9.0	9.7%
Totals for Area of Interest		**93.4**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Eastern Fresno Area, California

Hsr—Hesperia fine sandy loam, very deep

Map Unit Setting

National map unit symbol: 2yc9f
Elevation: 240 to 320 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 316 to 327 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

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

Description of Hesperia

Setting

Landform: Alluvial fans
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

Ap1 - 0 to 5 inches: fine sandy loam
Ap2 - 5 to 11 inches: fine sandy loam
Bt - 11 to 32 inches: fine sandy loam
Btk - 32 to 60 inches: fine sandy loam
2Bdk - 60 to 67 inches: stratified silt loam
2Cd - 67 to 79 inches: stratified silt loam

Properties and qualities

Slope: 0 percent
Depth to restrictive feature: 60 inches to densic material
Drainage class: Well drained
Runoff class: Negligible
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: 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: 2.0
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: B
Ecological site: R017XY905CA - Dry Alluvial Fans and Terraces
Hydric soil rating: No

Minor Components

Unnamed, loam surface

Percent of map unit: 10 percent
Landform: Alluvial fans
Hydric soil rating: No

Unnamed

Percent of map unit: 5 percent
Landform: Alluvial fans
Hydric soil rating: No

Hss—Hesperia fine sandy loam, very deep, saline-sodic

Map Unit Setting

National map unit symbol: 2yc9j
Elevation: 220 to 310 feet
Mean annual precipitation: 9 to 11 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 313 to 322 days
Farmland classification: Prime farmland if irrigated and reclaimed of excess salts and sodium

Map Unit Composition

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

Description of Hesperia

Setting

Landform: — error in exists on —
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

Ap1 - 0 to 5 inches: fine sandy loam
Ap2 - 5 to 11 inches: fine sandy loam
Btn - 11 to 32 inches: fine sandy loam
Btkn - 32 to 60 inches: fine sandy loam
2Bdkn - 60 to 67 inches: stratified silt loam
2Cd - 67 to 79 inches: stratified silt loam

Properties and qualities

Slope: 0 percent
Depth to restrictive feature: 60 inches to densic material
Drainage class: Well drained
Runoff class: Low

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: Rare
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: 30.0
Available water supply, 0 to 60 inches: Moderate (about 6.6 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

Minor Components

Unnamed

Percent of map unit: 15 percent
Landform: — error in exists on —
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

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APPENDIX H: CROSSLAND BASIN APE NRCS WEB SOIL SURVEY REPORT

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

Eastern Fresno Area, California

Crossland Basin APE Soil Map

October 25, 2023

Preface

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Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

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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.

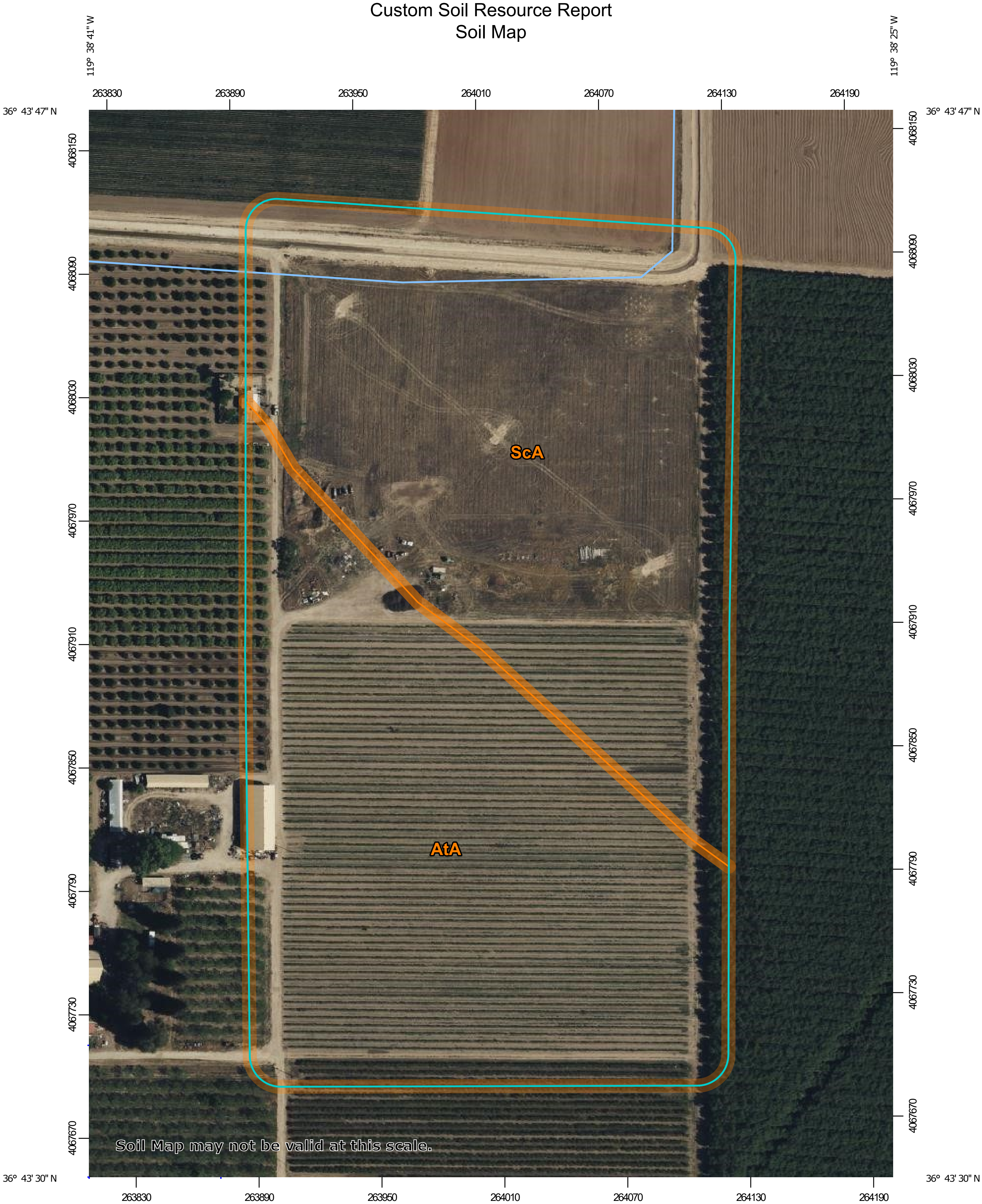
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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.

Soil Map



Map Scale: 1:2,530 if printed on A portrait (8.5" x 11") sheet.

Meters: 0, 35, 70, 140, 210

Feet: 0, 100, 200, 400, 600

N

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Eastern Fresno Area, California
Survey Area Data: Version 16, Aug 31, 2023

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

Date(s) aerial images were photographed: Mar 16, 2022—May 30, 2022

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
AtA	Atwater sandy loam, moderately deep, 0 to 3 percent slopes	12.3	49.4%
ScA	San Joaquin sandy loam, 0 to 3 percent slopes, MLRA 17	12.6	50.6%
Totals for Area of Interest		**24.8**	**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.

Eastern Fresno Area, California

AtA—Atwater sandy loam, moderately deep, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: hl10
Elevation: 250 to 450 feet
Mean annual precipitation: 9 to 14 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 250 to 275 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

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

Description of Atwater

Setting

Landform: Dunes on fan remnants
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian deposits derived from alluvium derived from granite

Typical profile

A - 0 to 24 inches: sandy loam
Bt - 24 to 40 inches: sandy loam
Cqm - 40 to 50 inches: cemented

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 40 to 60 inches to duripan
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.01 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 4.8 inches)

Interpretive groups

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

Minor Components

Unnamed, sandy clay loam subsoil

Percent of map unit: 12 percent
Landform: Dunes on fan remnants

Hydric soil rating: No

Delhi

Percent of map unit: 3 percent
Landform: Dunes on fan remnants
Hydric soil rating: No

ScA—San Joaquin sandy loam, 0 to 3 percent slopes, MLRA 17

Map Unit Setting

National map unit symbol: 2vncw
Elevation: 90 to 520 feet
Mean annual precipitation: 9 to 17 inches
Mean annual air temperature: 62 to 64 degrees F
Frost-free period: 240 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of San Joaquin

Setting

Landform: Terraces, fan remnants
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Interfluve, tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

Ap - 0 to 9 inches: sandy loam
Bt1 - 9 to 15 inches: sandy clay loam
2Bt2 - 15 to 21 inches: clay
2Bkqm - 21 to 37 inches: cemented material
2C - 37 to 79 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches; 19 to 25 inches to duripan
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 8 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
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: Very low (about 2.1 inches)

Interpretive groups

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

Minor Components

Snelling

Percent of map unit: 5 percent
Landform: Terraces, fan remnants
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Interfluve, tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Alamo

Percent of map unit: 4 percent
Landform: Terraces, fan remnants
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Interfluve, tread
Microfeatures of landform position: Open depressions, open depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Unnamed, hydric

Percent of map unit: 1 percent
Landform: Terraces, open depressions on fan remnants
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Interfluve, tread
Microfeatures of landform position: Open depressions
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

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APPENDIX I: KRUM BASIN APE NMFS EFH MAPPER

EFH Mapper Report

EFH Data Notice

Essential Fish Habitat (EFH) is defined by textual descriptions contained in the fishery management plans developed by the regional fishery management councils. In most cases mapping data can not fully represent the complexity of the habitats that make up EFH. This report should be used for general interest queries only and should not be interpreted as a definitive evaluation of EFH at this location. A location-specific evaluation of EFH for any official purposes must be performed by a regional expert. Please refer to the following links for the appropriate regional resources.

West Coast Regional Office

Query Results

Degrees, Minutes, Seconds: Latitude = 36º 44' 38" N, Longitude = 120º 6' 22" W
Decimal Degrees: Latitude = 36.744, Longitude = -119.894

The query location intersects with spatial data representing EFH and/or HAPCs for the following species/management units.

EFH

No additional Essential Fish Habitats (EFH) were identified at the report location.

Pacific Salmon EFH

No Pacific Salmon Essential Fish Habitat (EFH) were identified at the report location.

Atlantic Salmon

No Atlantic Salmon were identified at the report location.

HAPCs

No Habitat Areas of Particular Concern (HAPC) were identified at the report location.

EFH Areas Protected from Fishing

No EFH Areas Protected from Fishing (EFHA) were identified at the report location.

Spatial data does not currently exist for all the managed species in this area. The following is a list of species or management units for which there is no spatial data. ****For links to all EFH text descriptions see the complete data inventory: open data inventory -->**
Pacific Coastal Pelagic Species, Jack Mackerel, Pacific (Chub) Mackerel, Pacific Sardine, Northern Anchovy - Central Subpopulation, Northern Anchovy - Northern Subpopulation, **Pacific Highly Migratory Species**, Bigeye Thresher Shark - North Pacific, Bluefin Tuna - Pacific, Dolphinfish (Dorado or Mahimahi) - Pacific,

Spatial data does not currently exist for all the managed species in this area. The following is a list of species or management units for which there is no spatial data. ****For links to all EFH text descriptions see the complete data inventory: open data inventory -->**
Pelagic Thresher Shark - North Pacific, Swordfish - North Pacific

APPENDIX J: LAUB BASIN APE NMFS EFH MAPPER

EFH Mapper Report

EFH Data Notice

Essential Fish Habitat (EFH) is defined by textual descriptions contained in the fishery management plans developed by the regional fishery management councils. In most cases mapping data can not fully represent the complexity of the habitats that make up EFH. This report should be used for general interest queries only and should not be interpreted as a definitive evaluation of EFH at this location. A location-specific evaluation of EFH for any official purposes must be performed by a regional expert. Please refer to the following links for the appropriate regional resources.

West Coast Regional Office

Query Results

Degrees, Minutes, Seconds: Latitude = 36º 39' 19" N, Longitude = 120º 9' 12" W
Decimal Degrees: Latitude = 36.655, Longitude = -119.847

The query location intersects with spatial data representing EFH and/or HAPCs for the following species/management units.

EFH

No additional Essential Fish Habitats (EFH) were identified at the report location.

Pacific Salmon EFH

No Pacific Salmon Essential Fish Habitat (EFH) were identified at the report location.

Atlantic Salmon

No Atlantic Salmon were identified at the report location.

HAPCs

No Habitat Areas of Particular Concern (HAPC) were identified at the report location.

EFH Areas Protected from Fishing

No EFH Areas Protected from Fishing (EFHA) were identified at the report location.

Spatial data does not currently exist for all the managed species in this area. The following is a list of species or management units for which there is no spatial data. **For links to all EFH text descriptions see the complete data inventory: open data inventory -->
Pacific Coastal Pelagic Species, Jack Mackerel, Pacific (Chub) Mackerel, Pacific Sardine, Northern Anchovy - Central Subpopulation, Northern Anchovy - Northern Subpopulation, **Pacific Highly Migratory Species**, Bigeye Thresher Shark - North Pacific, Bluefin Tuna - Pacific, Dolphinfish (Dorado or Mahimahi) - Pacific,

Spatial data does not currently exist for all the managed species in this area. The following is a list of species or management units for which there is no spatial data. **For links to all EFH text descriptions see the complete data inventory: open data inventory -->**
Pelagic Thresher Shark - North Pacific, Swordfish - North Pacific

APPENDIX K: CROSSLAND BASIN APE NMFS EFH MAPPER

EFH Mapper Report

EFH Data Notice

Essential Fish Habitat (EFH) is defined by textual descriptions contained in the fishery management plans developed by the regional fishery management councils. In most cases mapping data can not fully represent the complexity of the habitats that make up EFH. This report should be used for general interest queries only and should not be interpreted as a definitive evaluation of EFH at this location. A location-specific evaluation of EFH for any official purposes must be performed by a regional expert. Please refer to the following links for the appropriate regional resources.

West Coast Regional Office

Query Results

Degrees, Minutes, Seconds: Latitude = 36º 43' 39" N, Longitude = 120º 21' 26" W
Decimal Degrees: Latitude = 36.727, Longitude = -119.643

The query location intersects with spatial data representing EFH and/or HAPCs for the following species/management units.

EFH

No additional Essential Fish Habitats (EFH) were identified at the report location.

Pacific Salmon EFH

No Pacific Salmon Essential Fish Habitat (EFH) were identified at the report location.

Atlantic Salmon

No Atlantic Salmon were identified at the report location.

HAPCs

No Habitat Areas of Particular Concern (HAPC) were identified at the report location.

EFH Areas Protected from Fishing

No EFH Areas Protected from Fishing (EFHA) were identified at the report location.

Spatial data does not currently exist for all the managed species in this area. The following is a list of species or management units for which there is no spatial data. **For links to all EFH text descriptions see the complete data inventory: open data inventory -->
Pacific Coastal Pelagic Species, Jack Mackerel, Pacific (Chub) Mackerel, Pacific Sardine, Northern Anchovy - Central Subpopulation, Northern Anchovy - Northern Subpopulation, **Pacific Highly Migratory Species**, Bigeye Thresher Shark - North Pacific, Bluefin Tuna - Pacific, Dolphinfish (Dorado or Mahimahi) - Pacific,

Spatial data does not currently exist for all the managed species in this area. The following is a list of species or management units for which there is no spatial data. ****For links to all EFH text descriptions see the complete data inventory: open data inventory -->**
Pelagic Thresher Shark - North Pacific, Swordfish - North Pacific

Appendix C: Cultural Class III Inventory/ Phase I Survey Report

Draft

CLASS III INVENTORY/PHASE I SURVEY, FRESNO IRRIGATION DISTRICT, RECHARGE BASIN PHASE II PROJECT, FRESNO COUNTY, CALIFORNIA

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March 2024
PN 36510.52

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MANAGEMENT SUMMARY

An intensive Class III cultural resources inventory/Phase I survey was conducted for the Fresno Irrigation District (FID) Recharge Basin Phase II Project (Project), Fresno County, California. This study involved the Krum Recharge Basin, Laub Recharge Basin, and Crossland Recharge Basin. This study was conducted by ASM Affiliates of Bakersfield, California, with ASM Director Peter A. Carey, M.A., RPA, serving as Principal Investigator and ASM Senior Archaeologist, Dustin Merrick, M.A., RPA as a contributing author. Fieldwork was conducted by ASM Field Director/Associate Archaeologist Robert Azpitarte, B.A., with assistance from ASM Assistant Archaeologists Maggie Lemus, B.A. and Maria Silva, B.A. ASM Senior Historian, Sarah Stringer-Bowsher, M.A., RPH, prepared the site-specific historical background, registration criteria, National Register of Historic Places (NRHP)/California Register of Historical Resources (CRHR) eligibility evaluation, and Finding of Effect. The study was undertaken to assist with compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and the California Environmental Quality Act (CEQA).

The FID proposes construction of three recharge basins in Fresno County within the boundary of the FID. The Project would assist the FID in expanding its groundwater recharge efforts. The basins will range in size from 20 to 80 acres (ac.). The proposed benefits of all three basins includes recharge, new storage of floodwater, providing new habitat for waterfowl, and to assist the FID in maintenance of its commitments to the Kings River Fisheries Management Program by providing a place for fish management water to be diverted in dry years. These basins are all in a critical location for the FID to perform recharge and will capture and use storm and flood water supplies available to the FID.

The horizontal Area of Potential Effect (APE) for the proposed Project, defined as the area of potential ground disturbance, including all work, staging, and laydown areas, totals 154 ac. The vertical APE for the proposed Project, defined as the maximum depth of excavation for the three basins, is approximately 20 feet (ft.).

A records search was conducted at the California State University, Bakersfield, Southern San Joaquin Valley Information Center (SSJVIC), by SSJVIC staff members on 12 December 2023. According to a records search of the SSJVIC, three previous studies have been conducted within the Project site and six previously recorded cultural resources are within the Project site. An additional five surveys had been completed within 0.5 mile (mi.) of the Project site and three previously recorded cultural resources are within the 0.5 mi. buffer.

A search of the NAHC Sacred Lands File was completed on 12 January 2024. Based on the NAHC records, no sacred sites or traditional cultural places had been identified within or adjacent to the APE. Outreach letters and follow-up emails were sent to tribal organizations on the NAHC contact list. As of March 2024, no responses have been received.

An intensive Class III inventory/Phase I survey determined that three historic resources are located within the APE that would be potentially impacted by the proposed project: a segment of the Houghton Canal (P-10-007097), a segment of Central No. 23/Fresno Canal (P-10-004677), and a segment of the Hansen Ditch (P-10-004724). Therefore, an evaluation for NRHP and CRHR eligibility was warranted. Segments of all three canals have been previously recorded and evaluated. For similar proposed recharge basin projects, previous NRHP evaluations of other main canals within the FID system and SHPO concurrence with those findings provide precent and guidance for evaluating a segment of the Central No. 23/Fresno Canal (P-10-004677), a segment of the Hansen Ditch (P-10-004724), and a segment of the Houghton Canal (P-10-007097). In those previous evaluations, Reclamation assumed eligibility for nineteenth century canals that were absorbed into an expansive irrigation system (FID) and the State Historic Preservation Officer (SHPO) concurred. In addition, Reclamation determined and SHPO concurred that the proposed recharge basin projects were in line with expected modifications within an irrigation district, and it did not impact character-defining features. Therefore, Reclamation had assumed eligibility for such projects. A comprehensive historic context for the FID system (1920-1974) has not been completed to date nor has an evaluation of the entire system during the FID era. As such, ASM applied the precedent of assumed eligibility to the evaluation of the three canal segments within the APEs based on the historical significance of the FID system for the San Joaquin Valley.

ASM recommends that this segment of the Houghton Canal be assumed eligible under Criterion A/1 and Criterion C/3 as part of the FID system with the period of significance of 1920-1974 and is assumed not eligible for the period of significance of 1874-1919 due to alignment changes. ASM recommends that this segment of the Central No. 23 Canal be assumed eligible under Criterion A/1 and Criterion C/3 as part of the FID system with the period of significance of 1920-1974 and is assumed not eligible for the period of significance of 1874-1919 due to alignment changes. ASM recommends that this segment of the Central No. 23 Canal be assumed eligible under Criterion A/1 and Criterion C/3 as part of the FID system with the period of significance of 1920-1974 and is assumed not eligible for the period of significance of 1874-1919 due to alignment changes.

The Project description confirms that the proposed Project will not alter the character-defining features of the Houghton Canal (P-10-007097), Central No. 23 (P-10-004677), and Hansen Ditch (P-10-004724), which are assumed eligible for the purposes of this undertaking under Criterion A/1 and Criterion C/3 as part of the FID system with the period of significance of 1920-1974 and is assumed not eligible for the period of significance of 1874-1919. Therefore, ASM recommends a determination of ***no adverse effect*** under Section 106 and ***no significant impact*** under CEQA is recommended. It is further recommended that, in the unlikely event that previously unrecorded cultural resources are identified during Project construction, work be halted within a 100 ft. radius of the find and a qualified archaeologist be contacted to evaluate the newly discovered resource.

1. INTRODUCTION AND REGULATORY CONTEXT

ASM Affiliates was retained by Provost and Pritchard Consulting Group to conduct an intensive Class III inventory/Phase I cultural resources survey for the Fresno Irrigation District (FID), Recharge Basin Phase II Project (Project), Fresno County, California (Figure 1). The purpose of this investigation was to assist with compliance with Section 106 of the National Historic Preservation Act (NHPA), as amended, and the California Environmental Quality Act (CEQA). The investigation was undertaken, specifically, to ensure that no significant adverse effects or impacts to historical resources or historic properties occur because of the construction of this project.

This current study included:

- A background records search and literature review to determine if any known archaeological sites were present in the project zone and/or whether the Project area had been previously and systematically studied by archaeologists;
- A search of the NAHC *Sacred Lands File* to determine if any traditional cultural places or cultural landscapes have been identified within the Project area, with outreach letters sent and follow-up calls made to the NAHC tribal contact list;
- An on-foot, intensive inventory of the Project area to identify and record previously undiscovered cultural resources and to examine known sites; and
- A preliminary assessment of any such resources found within the subject property.

This study was conducted by ASM Affiliates of Bakersfield, California, with ASM Director Peter A. Carey, M.A., RPA, serving as Principal Investigator and ASM Senior Archaeologist Dustin Merrick, M.A., RPA as a contributing author. Fieldwork was conducted by ASM Field Director/Associate Archaeologist Robert Azpitarte, B.A., with assistance from ASM Assistant Archaeologist Maggie Lemus, B.A. and Maria Silva, B.A. ASM Senior Historian, Sarah Stringer-Bowsher, M.A., RPH, prepared the historical background, registration criteria, National Register of Historic Places (NRHP)/California Register of Historical Resources (CRHR) evaluation, and finding of effect.

This report details the Class III inventory/Phase I survey. Subsequent chapters provide background to the investigation, including historic context studies; the findings of the archival records search; a summary of the field surveying techniques employed; the results of the fieldwork, and management recommendations for the Project.

1.1 PROJECT LOCATION, DESCRIPTION, AND AREA OF POTENTIAL EFFECT

The Project is within Fresno County, ranging from approximately 5.6 to 7.9 miles (mi.) from the city of Fresno. This places the Project on the open flats of the San Joaquin Valley. Specifically, the Project is within Section 3, Township 14 South, Range 19 East (T14S/R19E), Mount Diablo Base and Meridian (MDBM), Section 1 (T15S/R19E; MDBM), and Section 12 (T14S/R21E; MDBM), as illustrated on the Kearney Park, Fresno South, and Malaga USGS 7.5-minute topographic quadrangles. The proposed Project site consists of agricultural fields adjacent to unpaved and paved roads. Elevations within the Project area, which is mostly flat, range from 258 feet (ft.) above mean sea level (amsl) to 340 ft. asml. Figure 1 identifies the locations of the proposed Project.

The FID proposes construction of three recharge basins in Fresno County within the boundary of the FID. The Project would assist the FID in expanding its groundwater recharge efforts. The basins will range in size from 20 to 80 acres (ac.), totaling 154 ac. As such, the Project's horizonal Potential Affect (APE) is identified as 154 ac. The vertical APE for the proposed Project, defined as the maximum depth of excavation for the three basins, is approximately 20 feet (ft.).

The proposed benefits of all three basins includes recharge, new storage of floodwater, providing new habitat for waterfowl, and to assist the FID in maintenance of its commitments to the Kings River fisheries management program by providing a place for fish management water to be diverted in dry years. These basins are all in a critical location for the FID to perform recharge and will capture and use storm and flood water supplies available to the FID.

The following components will be consistent at each basin site:

- For the canal connections to the proposed basins, FID would cut a notch (less than 50 ft. wide) in the existing canal wall, insert a pipeline, and install one outlet structure (pre-cast concrete ideally or cast in place) into the canals.
- Basin depth will be up to 20 ft. below ground surface.
- Up to two monitoring wells,
- Metering stand and flow meter,
- Perimeter fencing- cattle fence,
- Excavation will be balanced onsite,
- Up to two recovery wells and discharge pipeline to deliver ~5 cfs to adjacent existing FID infrastructure (canal or pipeline).
- Maximum berm height of 6 ft. measured from the lowest point at the downstream toe of the berm to its maximum storage elevation, which is typically the spillway crest.

Specific details that are unique to each recharge basin are outlined below:

<u>Krum Recharge Basin</u>:

The Project includes construction of a 54 ac. recharge basin, including earthwork and structures near the intersection of North Hayes Avenue and West McKenzie Avenue, identified as APN 326-040-23S in Fresno County. The property is vacant and clear of vegetation. The FID owns the conveyance canal, Houghton No. 78, crossing the Project site. The Project will provide approximately 220 AF of flood water surface storage and recharge approximately 1,320 AF/year annual average. The Project includes the following construction components that would connect to Houghton No. 78 Canal which exists to the south (Figure 2).

- Basin outlet structure.
- Two existing well sites that will be properly abandoned or used for monitoring wells.
- The concrete structure below ground surface will be removed.
- Access is off Hayes.

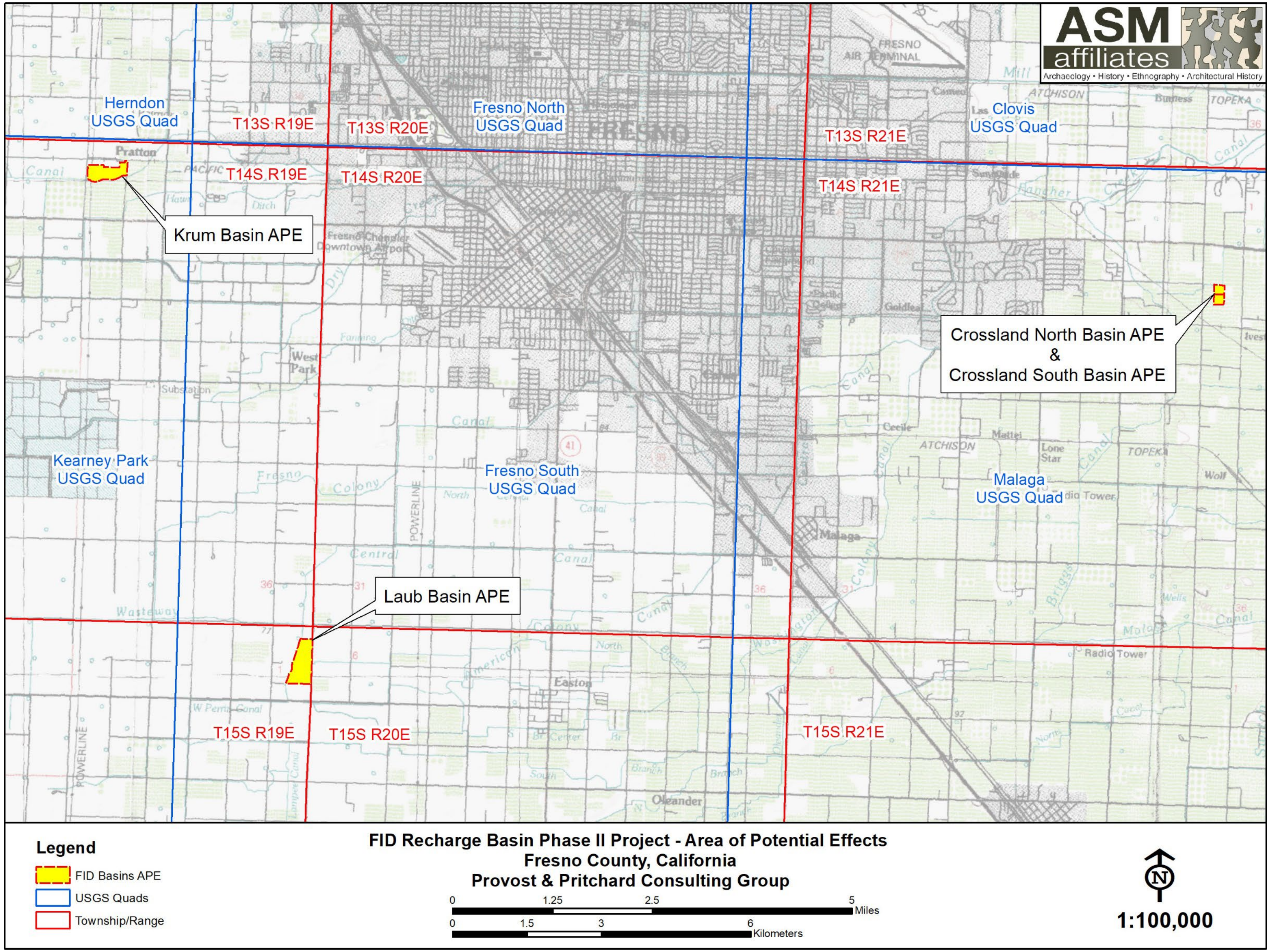

Figure 1. Locations of proposed Recharge Basin Phase II Project.

Laub Recharge Basin:

The Project includes construction of an 80 ac. recharge basin including earthwork and structures near the intersection of South Marks Avenue and West American Avenue, identified as APN 035-300-41S in Fresno County. The land has been previously cleared of vines and the APE will extend along the east side of the Central No. 23 District-owned canal. The project will provide approximately 300 AF of flood water surface storage and recharge approximately 1,800 AF/year annual average. The Project includes the following construction components that would connect to Central Canal No. 23 which is existing to the west (Figure 3).

- Basin outlet structure.
- Access will be off of Marks.

Crossland Recharge Basin:

The Project includes construction of a 20 ac. recharge basin including earthwork and structures, near the intersection of De Wolf Avenue and East Butler Avenue, identified as APNs 313-410-025 and 313-410-026, in Fresno County. The northern 10 ac. of the Project site has been cleared and the southern 10 ac. will be cleared prior to construction. The APE is south of the Hansen No. 29 Canal. The project will provide approximately 80 AF of flood water surface storage and recharge approximately 480 AF/year annual average. The Project includes the following construction components that would connect to Hansen No. 29 Canal which exists to the north (Figure 4).

- Basin outlet structure
- Access will be off Butler
- Start 2029.

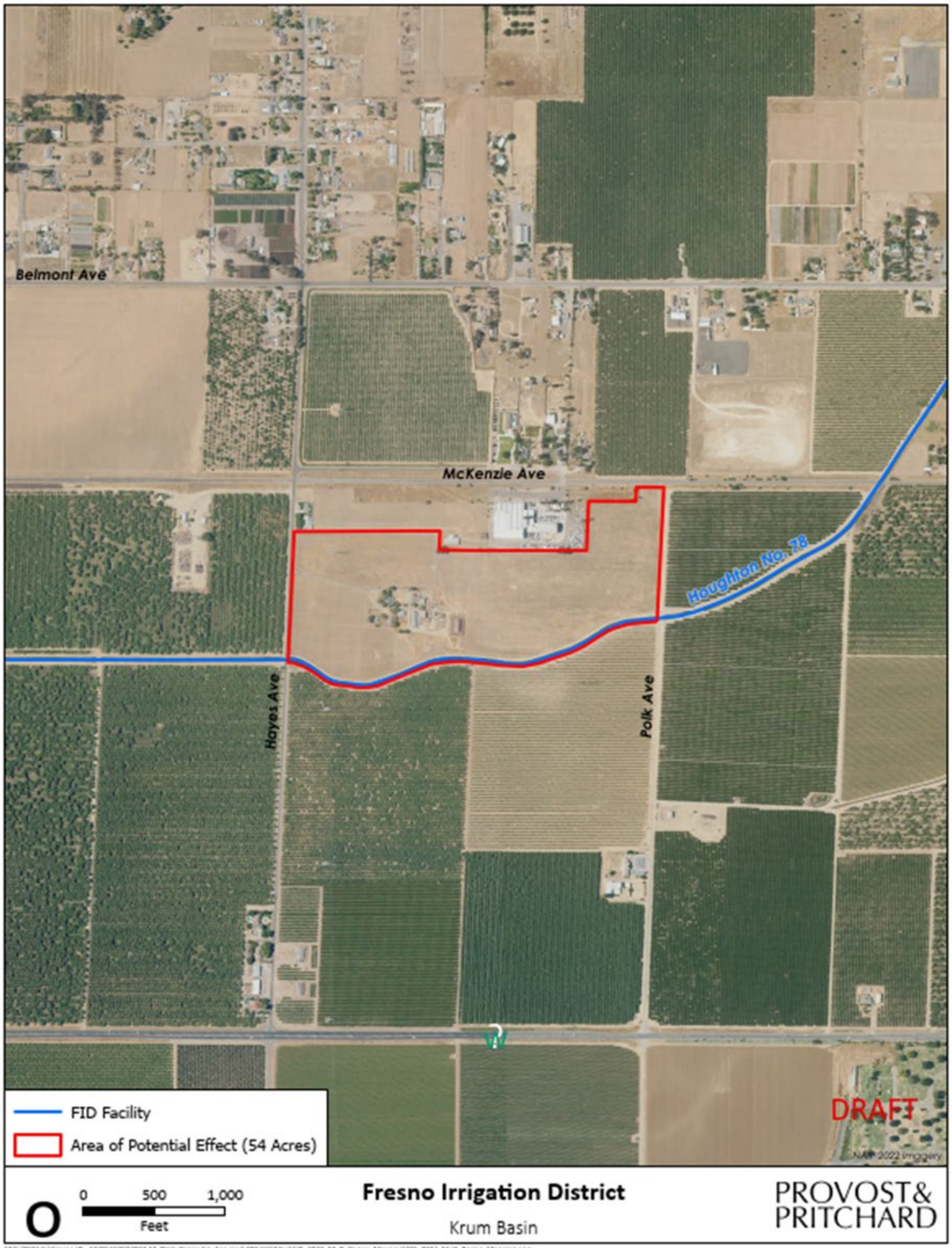

Figure 2. Krum Recharge Basin APE.

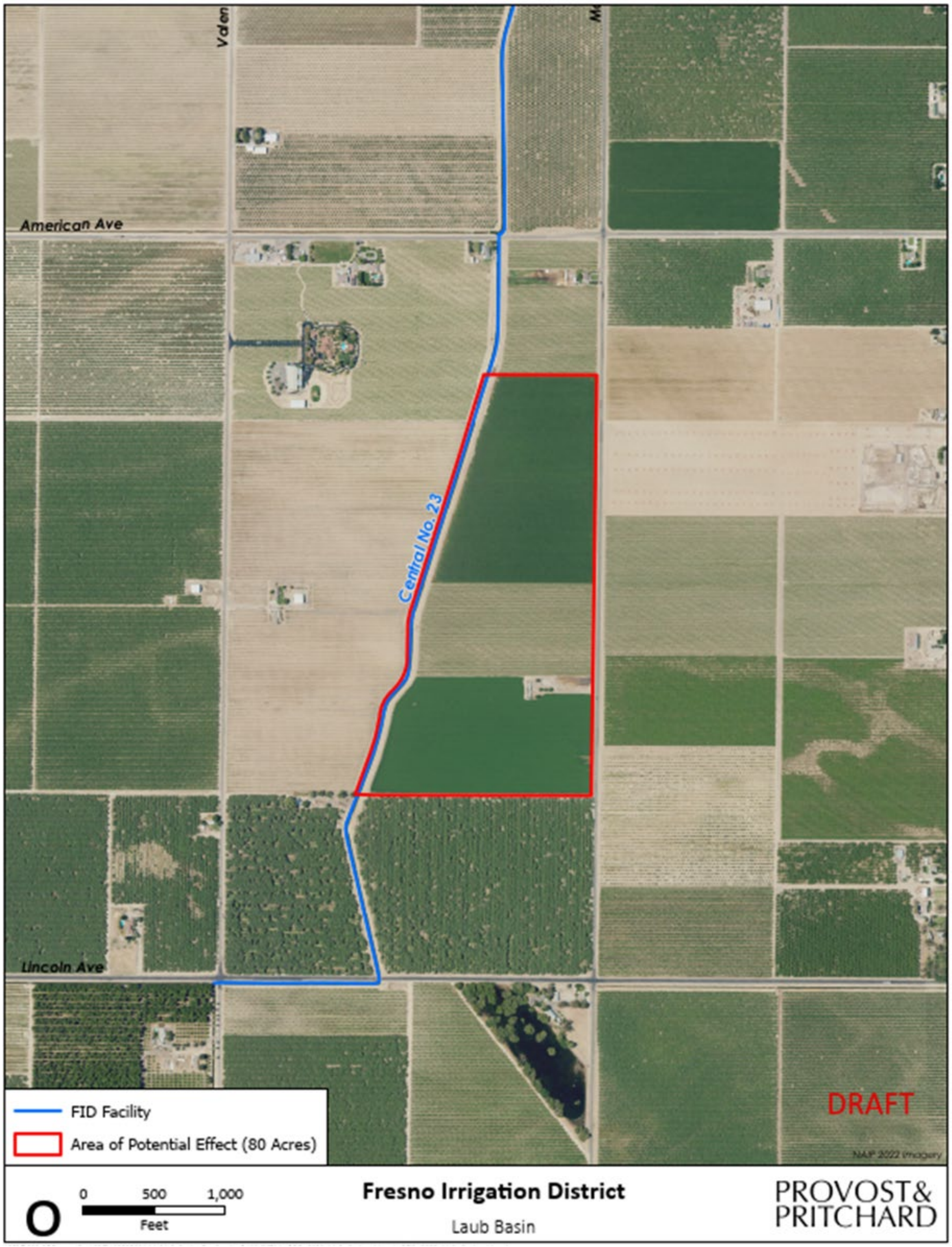

Figure 3. Laub Recharge Basin APE.

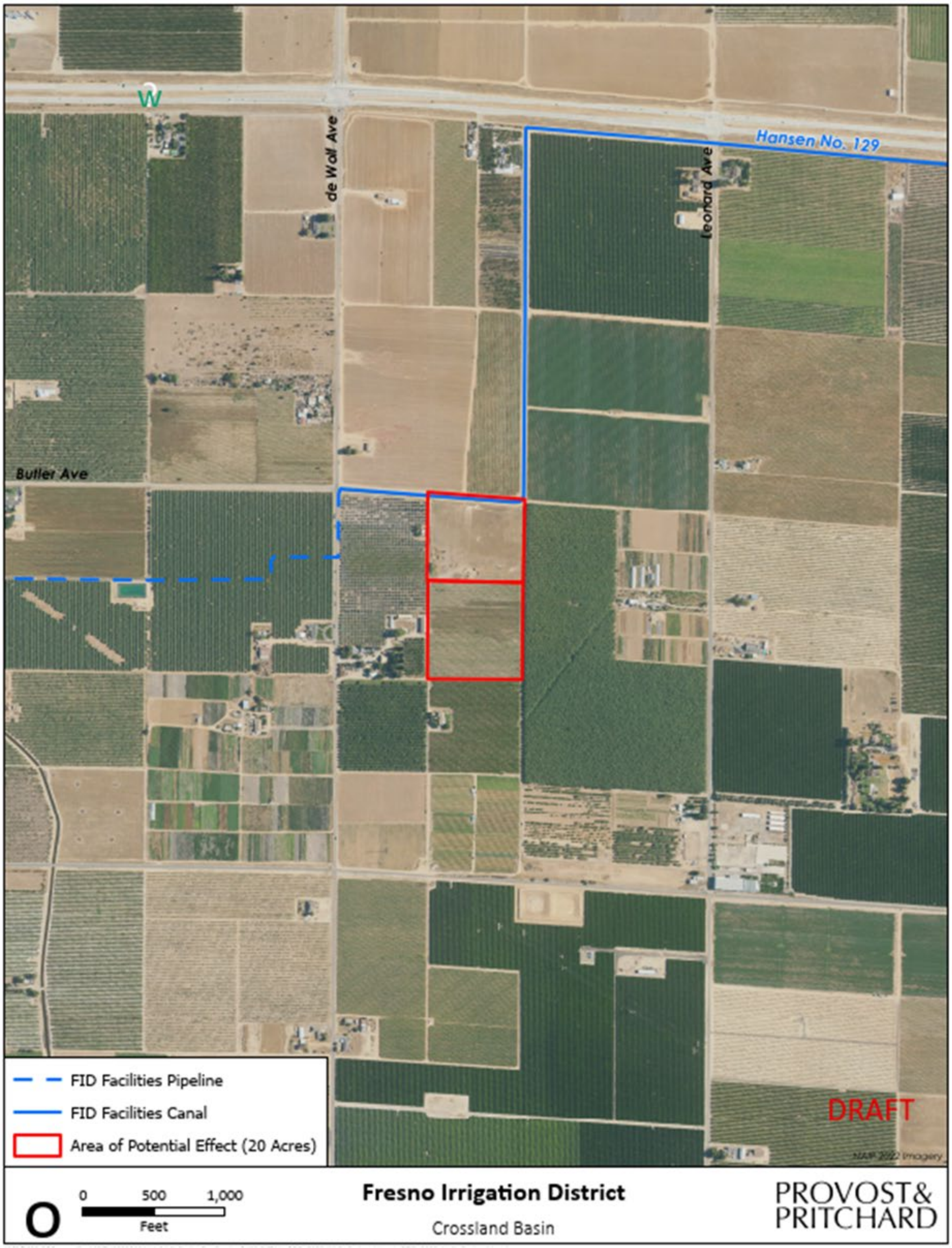

Figure 4. Crossland Recharge Basin APE.

1.2 REGULATORY CONTEXT

1.2.1 California Environmental Quality Act

CEQA is applicable to discretionary actions by state or local lead agencies. Under CEQA, lead agencies must analyze impacts to cultural resources. Significant impacts under CEQA occur when "historically significant" or "unique" cultural resources are adversely impacted, which occurs when such resources could be altered or destroyed through project implementation. Historically significant cultural resources are defined by eligibility for, or by listing in, the California Register of Historical Resources (CRHR). In practice, the federal NRHP criteria for significance applied under Section 106 are generally (although not entirely) consistent with CRHR criteria (see PRC § 5024.1, Title 14 CCR, Sections § 4852 and § 15064.5(a)(3)).

Significant cultural resources are those archaeological resources and historical properties that:

(A) Are associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

(B) Are associated with the lives of persons important in our past;

(C) Embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important creative individual, or possess high artistic values; or

(D) Have yielded, or may be likely to yield, information important in prehistory or history.

Unique resources under CEQA, in slight contrast, are those that represent:

> an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:
>
> (1) Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
>
> (2) Has a special and particular quality such as being the oldest of its type or the best available example of its type.
>
> (3) Is directly associated with a scientifically recognized important prehistoric or historic event or person (PRC § 21083.2(g)).

Preservation in place is the preferred approach under CEQA to mitigate adverse impacts to significant or unique cultural resources.

1.2.2 National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (Title 54 USC 300101 et seq.; 33 CFR Part 325 Appendix C; 36 CFR Part 800) is applicable to federal undertakings, including projects financed or permitted by federal agencies, regardless of whether the activities occur on land that is managed by federal agencies, other governmental agencies, or private landowners. Its purpose is to determine whether adverse effects will occur to significant cultural resources, defined as "historical properties" that are listed in or determined eligible for listing in the National Register of Historic Places (NRHP). The criteria for NRHP eligibility are defined at 36 CFR § 60.4 and include:

> The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that:
>
> (a) are associated with events that have made a significant contribution to the broad patterns of our history; or,
>
> (b) are associated with the lives of persons significant in our past; or,
>
> (c) embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or,
>
> (d) have yielded or may be likely to yield, information important in prehistory or history.

There are, however, restrictions to the kinds of historical properties that can be NRHP listed. These have been identified by the Advisory Council on Historic Preservation (ACHP), as follows:

> Ordinarily cemeteries, birthplaces, or graves of historical figures, properties owned by religious institutions or used for religious purposes, structures that have been moved from their original locations, reconstructed historic buildings, properties primarily commemorative in nature, and properties that have achieved significance within the past 50 years shall not be considered eligible for the NRHP. However, such properties will qualify if they are integral parts of districts that do meet the criteria or if they fall within the following categories:
>
> (a) A religious property deriving primary significance from architectural or artistic distinction or historical importance; or,
>
> (b) A building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or,
>
> (c) A birthplace or grave of a historical figure of outstanding importance if there is no appropriate site or building directly associated with his productive life; or,
>
> (d) A cemetery which derives its primary significance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events; or,
>
> (e) A reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived; or,

(f) A property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own exceptional significance; or,

(g) A property achieving significance within the past 50 years if it is of exceptional importance. (National Register of Historic Places 1997).

2. ENVIRONMENTAL AND CULTURAL BACKGROUND

2.1 ENVIRONMENTAL BACKGROUND AND GEOARCHAEOLOGICAL CONTEXT

At the time of the cultural resources survey, the APEs consisted of recently cleared agricultural lands adjacent to active farm fields. Although this general location currently may be characterized as a dry open valley bottom, historically it may have included swampy lands, lying a few miles south of the San Joaquin River (Preston 1981:17). Prior to development, oak groves and valley grasslands would have dominated (ibid:70). However, it is likely that riparian woodlands were once present along local drainages, including along the San Joaquin River north of the APE (see Schoenherr 1992).

A Caltrans geoarchaeological study that includes the general area provides a guide for the likelihood of subsurface archaeological deposits within the APEs (see Meyer et al. 2010). This study involved first determining the location and ages of late Pleistocene (>25,000 years old) landforms in the southern San Joaquin Valley. These were identified by combining a synthesis of 2,400 published paleontological, soils and archaeological chronometric dates with geoarchaeological field testing. The ages of surface landforms were then mapped to provide an assessment for the potential for buried archaeological deposits. These ages were derived primarily from the Soil Survey Geographic Database (SSURGO) and the State Soils Geographic (STATSGO) database. A map was created from this information that ranked locations in seven ordinal classes for sensitivity for buried soils, from Very Low to Very High. This map can be employed to provide a general measure of the potential for buried archaeological deposits in any given location.

According to this model, the Crossland North and South Basins and the Krum Basin have Very Low potential for buried archaeological deposits and the Laub Basin has Moderately Low potential for buried archaeological deposits. The presence of buried sites and cultural resources is therefore considered to be unlikely within the APE.

2.2 ETHNOGRAPHIC CONTEXT

Penutian-speaking Yokuts tribal groups occupied the southern San Joaquin Valley region and much of the nearby Sierra Nevada. Ethnographic information about the Yokuts was collected primarily by Powers (1971, 1976 [originally 1877]), Kroeber (1925), Gayton (1930, 1948), Driver (1937), Latta (1977), and Harrington (n.d.). For a variety of historical reasons, existing research information emphasizes the central Yokuts tribes which occupied both the valley and particularly the foothills of the Sierra. The northernmost tribes suffered from the influx of Euro Americans during the Gold Rush and their populations were in substantial decline by the time ethnographic studies began in the early twentieth century. In contrast, the southernmost tribes were partially removed by the Spanish to missions and eventually absorbed into multi-tribal communities on the Sebastian Indian Reservation (on Tejon Ranch), and later the Tule River Reservation and Santa

Rosa Rancheria to the north, as well as other reservations in the foothills and Sierras. The result is a scarcity of ethnographic detail on valley tribes, especially in relation to the rich information collected from the central foothills tribes where native speakers of the Yokuts dialects are still found. Regardless, the general details of indigenous lifeways were similar across the broad expanse of Yokuts territory, particularly in terms of environmentally influenced subsistence and adaptation and with regard to religion and belief, which were similar everywhere.

Following Kroeber (1925: Plate 47), the APEs most likely lie in Pitkachi (Pitkache in Latta [1977:163]) territory. The village for this group nearest the APEs was *Gewachiu* (*Gewachie* in Latta [1977:163]) on the south bank of the San Joaquin River, northwest of the four APEs.

Most Yokuts groups, regardless of specific tribal affiliation, were organized as a recognized and distinct tribelet; a circumstance that almost certainly pertained to the tribal groups noted above. Tribelets were land-owning groups organized around a central village and linked by shared territory and descent from a common ancestor. The population of most tribelets ranged from about 150 to 500 peoples (Kroeber 1925).

Each tribelet was headed by a chief who was aided by a variety of assistants, the most important of whom was the *winatum*, a herald or messenger and assistant chief. A shaman also served as religious officer. While shamans did not have any direct political authority, as Gayton (1930) has illustrated, they maintained substantial influence within their tribelet.

Shamanism is a religious system common to most Native American tribes. It involves a direct and personal relationship between the individual and the supernatural world enacted by entering a trance or hallucinatory state (usually based on the ingestion of psychotropic plants, such as jimsonweed or more typically native tobacco). Shamans were considered individuals with an unusual degree of supernatural power, serving as healers or curers, diviners, and controllers of natural phenomena (such as rain or thunder). Shamans also produced the rock art of this region, depicting the visions they experienced in vision quests believed to represent their spirit helpers and events in the supernatural realm (Whitley 1992, 2000).

The centrality of shamanism to the religious and spiritual life of the Yokuts was demonstrated by the role of shamans in the yearly ceremonial round. The ritual round, performed the same way each year, started in the spring with the jimsonweed ceremony, followed by rattlesnake dance and (where appropriate) first salmon ceremony. After returning from seed camps, fall rituals began in the late summer with the mourning ceremony, followed by first seed and acorn rites and then bear dance (Gayton 1930:379). In each case, shamans served as ceremonial officials responsible for specific dances involving a display of their supernatural powers (Kroeber 1925).

Subsistence practices varied from tribelet to tribelet based on the environment of residence. Throughout Native California, and Yokuts territory in general, the acorn was a primary dietary component, along with a variety of gathered seeds. Valley tribes augmented this resource with lacustrine and riverine foods, especially fish and wildfowl. As with many Native California tribes, the settlement and subsistence rounds included the winter aggregation into a few large villages, where stored resources (like acorns) served as staples, followed by dispersal into smaller camps, often occupied by extended families, where seasonally available resources would be gathered and consumed.

Although population estimates vary and population size was greatly affected by the introduction of Euro-American diseases and social disruption, the Yokuts were one of the largest, most successful groups in Native California. Cook (1978) estimates that the Yokuts region contained 27 percent of the aboriginal population in the state at the time of contact; other estimates are even higher. Many Yokut descendants continue to live in Fresno County, either on tribal reservations, or in local towns and communities.

2.3 PRE-CONTACT ARCHAEOLOGICAL BACKGROUND

The San Joaquin Valley region has received minimal archaeological attention compared to other areas of the state. In part, this is because the majority of California archaeological work has been concentrated in the Sacramento Delta, Santa Barbara Channel and central Mojave Desert areas (see Moratto 1984). Although knowledge of the region's prehistory is limited, enough is known to determine that the archaeological record is broadly similar to south-central California as a whole (see Gifford and Schenk 1926; Hewes 1941; Wedel 1941; Fenenga 1952; Elsasser 1962; Fredrickson and Grossman 1977; Schiffman and Garfinkel 1981). Based on these sources, the general prehistory of the region can be outlined as follows.

Initial occupation of the region occurred at least as early as the *Paleoindian Period*, or prior to about 10,000 YBP (years before present). Evidence of early use of the region is indicated by characteristic fluted and stemmed points found around the margin of Tulare Lake, in the foothills of the Sierra, and in the Mojave Desert proper. (In each case, these are locations many mi. distant from the Project APE.)

Both fluted and stemmed points are particularly common around the Tulare Lake margins, suggesting a terminal Pleistocene/early Holocene lakeshore adaptation similar to that found throughout the far west at the same time; little else is known about these earliest peoples. More than 250 fluted points have been recovered from the Witt Site (CA-KIN-32), located along the western shoreline of ancient Tulare Lake southwest of the Project APEs, demonstrating the importance of this early occupation in the San Joaquin Valley specifically (see Fenenga 1993). Additional finds consist of a Clovis-like projectile point discovered in a flash-flood cut-bank near White Oak Lodge in 1953 on Tejon Ranch (Glennan 1971). More recently, a similar fluted point was found near Bakersfield (Zimmerman et al. 1989), and a number are known from the Edwards Air Force Base and Boron area of the western Mojave Desert. Although human occupation of the state is well-established during the Late Pleistocene, relatively little can be inferred about the nature and distribution of this occupation with a few exceptions. First, little evidence exists to support the idea that people at that time were big-game hunters, similar to those found on the Great Plains. Second, the western Mojave Desert evidence suggests small, very mobile populations that left a minimal archaeological signature. The evidence from the ancient Tulare Lake shore, in contrast, suggests a much more substantial population and settlements which, instead of relying on big game hunting, were tied to the lacustrine lake edge. Variability in subsistence and settlement patterns is thus apparent in California, in contrast to the Great Plains.

Substantial evidence for human occupation of California first occurs during the middle Holocene, roughly 7,500 to 4,000 YBP. This period is known as the *Early Horizon*, or alternatively as the Early Millingstone along the Santa Barbara Channel. In the south, populations concentrated along the coast with minimal visible use of inland areas. Adaptation emphasized hard seeds and nuts with tool-kits dominated by mullers and grindstones (manos and metates). Additionally, little evidence for Early Horizon occupation exists in most inland portions of the state, partly due to a severe cold and dry paleoclimatic period occurring at the time. Regardless of specifics, Early Horizon population density was low with a subsistence adaptation more likely tied to plant food gathering than hunting.

Environmental conditions improved dramatically after about 4,000 YBP during the *Middle Horizon* (or Intermediate Period). This period, known climatically as the Holocene Maximum (circa 3,800 YBP), was characterized by significantly warmer and wetter conditions than previously experienced. Archaeologically, it was marked by large population increase and radiation into new environments along coastal and interior south-central California and the Mojave Desert (Whitley 2000). In the Delta region to the north, this same period of favorable environmental conditions was characterized by the appearance of the Windmiller culture which exhibited a high degree of ritual elaboration (especially in burial practices) and perhaps even rudimentary mound-building tradition (Meighan, personal communication, 1985). Along with ritual elaboration, Middle Horizon times experienced increasing subsistence specialization, perhaps correlating with the appearance of acorn processing technology. Penutian speaking peoples (including the Yokuts) are also posited to have entered the state roughly at the beginning of this period and, perhaps, to have brought this technology with them (cf. Moratto 1984). Likewise, it appears the so-called "Shoshonean Wedge" in southern California or the Takic speaking groups that include the Gabrielino/Fernandeño, Tataviam and Kitanemuk, may have moved into the region at this time, rather than at about 1,500 BP as first suggested by Kroeber (1925).

Evidence for Middle Horizon occupation of interior south-central California is substantial. For example, in northern Los Angeles County along the upper Santa Clara River, to the south of the San Joaquin Valley, the Agua Dulce village complex indicates occupation extending back to the Intermediate Period, when the population of the village may have been 50 or more people (King et al n.d.). Similarly, inhabitation of the Hathaway Ranch region near Lake Piru, and the Newhall Ranch near Valencia, appears to date to the Intermediate Period (W & S Consultants 1994). To the west, little or no evidence exists for pre-Middle Horizon occupation in the upper Sisquoc and Cuyama River drainages; populations first appear there at roughly 3,500 YBP (Horne 1981). The Carrizo Plain, the valley immediately west of the San Joaquin, experienced a major population expansion during the Middle Horizon (W & S Consultants 2004; Whitley et al. 2007), and recently collected data indicates the Tehachapi Mountains region was first significantly occupied during the Middle Horizon (W & S Consultants 2006). A parallel can be drawn to the inland Ventura County region where a similar pattern has been identified (Whitley and Beaudry 1991), as well as the western Mojave Desert (Sutton 1988a, 1988b), the southern Sierra Nevada (W & S Consultants 1999), and the Coso Range region (Whitley et al. 1988). In all these areas a major expansion in settlement, the establishment of large site complexes, and an increase in the range of environments exploited appear to have occurred sometime roughly around 4,000 years ago. Although most efforts to explain this expansion have focused on local circumstances and events, it is increasingly apparent this was a major southern California-wide occurrence and any explanation must be sought at a larger level of analysis (Whitley 2000). Additionally, evidence from the Carrizo Plain suggests the origins of the tribelet level of political organization developed during this period (W & S Consultants 2004; Whitley et al. 2007). Whether this same demographic process holds for the southern San Joaquin Valley, including the Project APE, is yet to be determined.

The beginning of the *Late Horizon* is set variously at 1,500 and 800 YBP, with a consensus for the shorter chronology. Increasing evidence suggests the importance of the Middle-Late Horizons transition (AD 800 to 1200) in the understanding of south-central California. This corresponds to the so-called Medieval Climatic Anomaly, a period of climatic instability that included major droughts and resulted in demographic disturbances across much of the west (Jones et al. 1999). It is also believed to have resulted in major population decline and abandonments across south-central California, involving as much as 90 percent of the interior populations in some regions including the Carrizo Plain (Whitley et al. 2007). It is not clear whether site abandonment was accompanied by a true reduction in population or an agglomeration of the same numbers of peoples into fewer but larger villages. What is clear is that Middle Period villages and settlements were widely dispersed across the landscape; many at locations that lack contemporary evidence of fresh water sources. Late Horizon sites, in contrast, are typically located where fresh water was available during the historical period, if not currently.

One extensively studied site that shows evidence of intensive occupation during the Middle-Late Horizons transition (~1,500 – 500 YBP) is the Redtfeldt Mound (CA-KIN-66/H), located near the Santa Rosa Rancheria, northwest of the Project APE. There, Siefkin (1999) reported on human burials and a host of artifacts and ecofacts excavated from a modest-sized mound. He found that both Middle Horizon and Middle-Late Horizons transition occupations were more intensive than Late Horizon occupations, which were sporadic and less intensive (Siefkin 1999:110-111).

The subsequent Late Horizon can be best understood as a period of recovery from a major demographic collapse. One result is the development of regional archaeological cultures as the precursors to ethnographic Native California, suggesting that ethnographic lifeways recorded by anthropologists extend roughly 800 years into the past.

The position of San Joaquin Valley prehistory relative to patterns seen in surrounding areas is still somewhat unknown. The presence of large lake systems in the valley bottoms can be expected to have mediated some of the desiccation seen elsewhere. But, as the reconstruction of Soda Lake in the nearby Carrizo Plain demonstrates (see Whitley et al. 2007) environmental perturbations had serious impacts on lake systems too. Identifying certain of the prehistoric demographic trends for the southern San Joaquin Valley and determining how these trends (if present) correlate with those seen elsewhere, is a current important research objective.

2.4 HISTORIC CONTEXT

2.4.1 Fresno Plains

The following historic context is excerpted from the Fresno Irrigation District[1]:

> Long before there were canals or irrigation districts crisscrossing what is now Fresno County, there was the land but little more. It seemed to be a stark, endless prairie, populated only by antelope, wild horses, occasional tule elk and other creatures. The region's original human inhabitants spurned the empty plains. These Native Americans – the Yokuts – resided along the wooded banks of what became known as the Kings and San Joaquin rivers, or in the foothills and more distant Sierra ranges. The valley floor between the rivers offered little more than hunting opportunities or pathways for travel to visit other tribes. The prairie's flora was hardly enticing. "So desolate was the plain, that one could journey 20 mi. in any direction without so much as finding a bush large enough to cut a horse switch," a pioneer wrote in later years about this land as travelers found it in 1870 and earlier. The area now included within the Fresno Irrigation District would become known as the Fresno Plains, and plain it was. It was, for the most part, flat with exception of an occasional "hog wallow" of 1 - 5 ft. in depth. Soil was sandy loam with some hardpan. Fresno took its name from the Spanish for ash tree. It was derisively, but inaccurately, referred to as a desert. The surface was graced by types of native grasses that thrived on winter and spring rains, only to wilt and often vanish into bare earth under summer's intense sunshine. Strong winds regularly stirred large and blinding clouds of dust. Only where a few small foothill spawned seasonal streams came together at lower points within what would become FID (particularly in and near the future downtown Fresno), was there ever any significant wet relief. After larger storms, runoff would pool in what later became known as "Sinks of the Dry Creek." Like the grassland, these shallow and short-lived ponds were no match for summer's dry heat. It was a place that, at best, harshly greeted newcomers with irreducibly minimal prospects of any future potential.
>
> Prior to 1835, the Fresno Plains had been known only to Native Americans and a handful of explorers, fur trappers and other traders. Little changed after the American flag was raised over Monterey in 1847 and California statehood was achieved in 1850. California's Gold Rush, however, would eventually be the catalyst for initial American settlement in the Fresno area. Modest San Joaquin River gold discoveries led to establishment of Rootville in 1851. This riverside village would soon be renamed Millerton, to become county seat when Fresno County was organized in 1856. Gold fever only modestly touched the Kings River region but a small amount of settlement related to agriculture and transportation (such as ferryboat crossings) began downstream from the foothills in the early 1850s. Early settlers to the Fresno area encountered the empty valley dominated by fields filled with cattle. Within what became known as the Centerville Bottoms occurred the first small Kings River diversions for irrigation, starting with Byrd Slough in 1858. Further downstream and stretching 26 mi. along the river's north bank was an 1846

[1] Fresno Irrigation District. Available at https://www.fresnoirrigation.com/_files/ugd/932427_1a9b4c0698374fbd8109fd25fca65f68.pdf?index=true#:~:text=Two%20early%20settlers%2C%20A.Y.,FID%20as%20it%20exists%20today. Accessed November 20, 2023.

Mexican land grant, Rancho Laguna de Tache. This rancho some four decades later would play a complicated but crucial role in shaping the Fresno Plains' water rights. The Fresno Plains remained unsettled well into the 1860s. That was soon to forever change as courses of water were created to moisten the thirsty soil.

Throughout the 1850s and 60s, the Fresno Plains lacked commerce and showed no sign of community life. Gradually, however, the barren land began to be noticed. Its potential was not easily imagined. Those who arrived after the Gold Rush peaked were from far flung places but shared a desire to make a new life in California. A few went to work attempting to tame the Fresno Plains. A cattle industry was born and grew. Sheep were herded. Hogs were produced. Substantial but undeveloped land holdings were established. There were several small farming experiments, particularly near the rivers. The first significant Fresno Plains agricultural undertaking was made possible by the 1868 purchase of 5,000 ac. east of what was soon to become the new town of Fresno by Captain A.Y. Easterby.

2.4.2 Fresno Irrigation District (FID)

The following historic context is excerpted from the Fresno Irrigation District[2]:

In 1864, Easterby became one of the Napa Valley Railroad's founders. In 1868, Easterby joined San Joaquin Valley Land Association investors who were purchasing 80,000 ac. of land in Fresno County. Easterby subscribed to buy 5,000 ac. He paid $1.80 per ac., sight unseen, hoping to eventually sell the land for perhaps $5 per ac. A Napa County acquaintance, Moses J. Church, was desperate for better pasture on which to relocate his starving sheep. Easterby gave Church permission to drive his flock to Easterby's Fresno Plains land. Easterby struggled over how to use the Fresno land. With great difficulty, he traveled to see his remote purchase. At Church's camp, Easterby found knee-deep grass and sunflowers 10 ft. high. He concluded that, rather than being worthless desert, the land was so fertile that it would surely grow wheat. Easterby hoped his initial harvest would take place in 1869. His first crops failed for lack of water as well as damage from cattle and wild horses. Easterby knew about irrigation. He'd seen such projects in the Mediterranean and was aware of similar plans elsewhere in California. Easterby hired Church to begin working on a plan to irrigate Easterby's farm. Both men shared another determined reason to succeed. Each had been threatened by cattlemen in the Centerville area who were equally resolute to drive farmers' crops from their cattle country. A survey began in 1870. Two small canals, the Sweem and Centerville ditches, were purchased along the Kings River northeast of Centerville to convey water to the projected canal route. In February 1871, the Fresno Canal and Irrigation Company was incorporated by Church. Its Fresno Canal soon began to take shape between the Kings, where a headworks structure was to be located (near a brush and rock dam Church sited in the river channel), to the usually dry bed of Fancher Creek, several mi. to the west. The creek, in turn, would soon deliver water to Easterby's ranch. There, 2,000 ac. of wheat were planted. Along with water, rail transportation was arriving on the Fresno Plains. Late in 1871, with Easterby's

[2] Fresno Irrigation District. Available at https://www.fresnoirrigation.com/_files/ugd/932427_1a9b4c0698374fbd8109fd25fca65f68.pdf?index=true#:~:text=Two%20early%20settlers%2C%20A.Y.,FID%20as%20it%20exists%20today. Accessed November 20, 2023.

newly irrigated young wheat having germinated into a sea of green, a Central Pacific Railroad inspection party reached Fresno County. Company President and former California Governor Leland Stanford and his group were inspecting the railroad's chosen San Joaquin Valley route. A major town and station were then planned on four sections of land (2,560 ac.) where the railroad was to bridge the San Joaquin River [the present site of Herndon]. Visiting Easterby's farm and seeing the thriving young wheat and new irrigation works impressed Stanford. He recognized the land's potential as an irrigated region and ordered a major townsite called Fresno to be plotted on the plains nearby when the rails arrived from the north the next spring.

The Central Pacific Railroad, the valley's new and much-improved transportation link, in the 1870s was moving people and goods. It was obvious to Fresno's first residents that canals from the Kings River had truly ushered in the beginning of major development. Moses J. Church, working with A.Y. Easterby and a few others, took the lead in planning the Fresno Canal and its use of a natural stream — Fancher Creek — to convey water onto the Fresno Plains. In February 1871, Church's Fresno Canal and Irrigation Company began developing and expanding direction of the Fresno Plains' irrigation system and management, as it did for nearly a half century. Church became known as the "Father of Fresno Irrigation." Church, like virtually all Fresno area pioneers, was a native of somewhere else. He was born in New York state in 1819. Church came to California as a blacksmith in 1852 and the following year helped construct a canal along the Cosumnes River. He eventually entered the sheep business in Napa County before arriving on the Fresno Plains at Easterby's invitation in 1868. The Fresno Canal lured would-be farmers and inspired the new town of Fresno. Land was soon selling quickly. Establishment of so-called colonies — essentially agricultural subdivisions on which parcels were sold along with water rights — fueled this growth. The first of these, proposed in 1875, was the 4,000 ac. Central California Colony, plotted for family farms south of downtown Fresno with lots of 20 ac. by Bernard Marks and William D. Chapman. Canals and colonies soon transformed the barren Fresno Plains into highly productive farmland, enabling extensive wheat cultivation and, within little more than a decade, introduction of grape and tree fruit crops. This, coupled with the railroad's initiation of fairly rapid and reliable — although expensive — transportation, plus arrival of aggressive and promotion-minded land speculators, led to rapid Fresno growth. By 1874, the county seat of Fresno County had been transferred to the new settlement from Millerton. Moses Church would have to contend with many dilemmas in the years ahead, but his grand irrigation system scheme succeeded. By the late 1880s, the artificial streams Church pioneered had brought life throughout the Fresno Plains.

In a thirsty land that transitioned from frontier to valued farmland in 10 years or less, it was no surprise that other Fresno area canals and companies quickly became reality. Moses Church's company, its water supplies and the nearly instant settlement boom with agricultural and commercial development, continued growing. Small farm lateral ditches and other primary canals were built. So was a second major canal company system. Even before Church's construction had managed to coax water from the Kings River into the Fresno Canal and Fancher Creek in 1871, the Kings River and Fresno Canal Company was organized. Its project languished. By 1874, nurseryman L.A. Gould and other investors bought the company to bring water to lands north of Church's system, ultimately including the Gould and Enterprise canals. A good deal of legal conflict existed between the Church and Gould systems until 1885. Then, a lengthy court case concluded. The Fresno Canal and Irrigation Company purchased the Gould Canal and, soon after, the Enterprise [Figure 5]. With that, Church controlled essentially all the primary canal distribution system now serving the Fresno Irrigation District. In 1877, he sold the company to a bank, only to repurchase the firm a few years later. The Fresno company sold water rights to landowners under contracts initiated on February 16, 1871, when Church incorporated the firm. These were to expire 50 years later. Annual charges for first- and second-class water were typically 62½ cents per ac., but occasionally as high as $1 per ac. if the Church company maintained lateral canals or community ditches. There were frequent disputes over water deliveries and maintenance. Rights-of-way were also causes of friction. Fresno's irrigation and farm development swiftly inspired similar interest along the Kings River. One of the earliest projects was made possible by Church. In 1875, Church granted water rights to pioneer settlers north of Kingsburg with water to be delivered from the Fresno Canal into the advantageously located Lone Tree Channel, a natural foothill stream. In return, the Kingsburg farmers spent months in 1875 and 1876 increasing capacity, digging and deepening the Fresno Canal. The Fresno company in 1882 took over the Lone Tree and eventually expanded its service area to 8,000 ac. Although the Lone Tree's right has remained tied to Fresno's, the canal was transferred to the Consolidated Canal Company in 1921.

L.A. Nares, one of the English capitalists, took over the Fresno Canal and Irrigation Company's management as well as that of the [Laguna de Tache] Grant. These ownerships and the Grant's old riparian rights essentially gave the English and Canadian investors full Kings River control for more than 25 years. Nares sought more Kings River legal stability. In 1897, he brought the senior Kings River diverters together to frame and adopt the river's first water flow entitlement schedule. This agreement included only the Fresno company and three lower river firms in Kings County, Peoples Ditch Company, Last Chance Water Ditch Company and Lower Kings River Ditch [now Lemoore] Company, as well as a small but constant Laguna Grant supply. Only the river's low flows below 1,900 cfs. were included but it was a start. Many [water rights] lawsuits were dismissed or settled. The agreement was generally recognized by other river users. The original schedule's numbers were included in later agreements and remain in use today.

Fresno's water development had been founded by building monopolies in conveyance, distribution and, most importantly, control. Dr. E.B. Perrin's successful effort to wrest away the Kings River's riparian straitjacket by buying the Laguna de Tache Grant, followed by L.A. Nares' water rights compromise of 1897, were initially cheered by that era's Fresno County farmers who believed the Kings River's monopolization had been broken. It had not. Nares' administration of an insurance syndicate's new ownership resulted in his leadership of the Fresno Canal and Irrigation Company around Fresno; Laguna Lands Limited, Summit Lake Investment Company, and Laton and Western Railroad on the Grant; and the Consolidated Canal Company around Selma. He and his investor colleagues controlled Kings River water used on more than 400,000 ac. Farmers had to enter into contracts spanning 50 years in order to receive water. Many were not pleased. Most, however, remained primarily interested in developing their own farms, homes and communities in the land they'd pioneered. Except to voice complaints, few took part in company water business, operations and projects overseen by I. Teilman, the water engineer and superintendent for Nares. As a result, the region's earlier antimonopolistic fervor and campaign failed. Nares held all the cards, but offered the Fresno area's first significant water-related peace, progress and stability.

Moving into and through the 20th century's first generation, Fresno's agricultural water systems and land values joined the greater community in steady advancement. This growing maturity helped the region cast off its pioneer era trappings and germinated public interest in water resources and ownership. Among those were the Sierra Nevada water supplies that had enabled the Fresno area to overcome being known as a desert. Water made the once-empty plains blossom into agricultural gardens filled with productivity. That vital resource began to be directed into meeting contemporary needs and desires. Three unresolved Fresno area water concerns needed addressing. These included still-unsettled regional water rights, monopolistic water company practices, and planning and developing water storage projects. All three were ideas hatched late in the 19th century. By 1920, they were being coaxed toward outcomes enduring today. Taking longest to become reality — more than 70 years — were Pine Flat Dam and Reservoir. Storage correctly came to be viewed as a means of harvesting and conserving winter and spring runoff for irrigation use during the valley's hot, dry summers when river flows were usually too low to meet needs. Major 1906 flooding raised public interest in controlling high flows. In 1909, Fresno Canal and Irrigation Company President L.A. Nares and Superintendent-Engineer I. Teilman filed what was called the "Pine Flat Notice" to appropriate some surplus and flood runoff water. Five years later, M.F. Tarpey applied with the California Water Commission for Kings River storage rights as part of a growing movement, started in 1913, to build Pine Flat Dam. Proponents went so far to propose regional public districts that could sponsor and arrange project financing and construction. Interest in Pine Flat would lead directly to transitioning irrigation system control from private hands into public responsibility. A longer process, but one also ultimately successful, sought to resolve Kings River water rights. Water rights had been the Kings River's first great issue.

The riparian dispute and its court-ordered bans on most canal deliveries were set aside, but not resolved, by Fresno's Laguna de Tache Grant acquisition and low flow entitlement compromise agreement leadership. Pine Flat Project proponents realized that remaining water right lawsuits and related disputes would block any hopes of financing and building a dam. In 1913, efforts were started to settle the river's remaining water right controversies. A big step forward was taken in 1917 when Kings River water users asked the state to provide an impartial water engineer. Charles L. Kaupke was named. He quickly went to work to gather data on river flows, diversions, canal capacities and historical uses, information that would be required to prepare an entitlement schedule for the river's "units," as they became known. During a dry 1919 season, these agencies unanimously asked that state officials designate Kaupke as Watermaster to arbitrate diversion disputes. Also during 1919, a separate movement was taking shape to bring public ownership to Fresno's canal system. As it turned out, what by then had been renamed the Fresno Canal and Land Corporation, was in its final months as Fresno's privately-owned canal operator.

In 1920, with interest growing quickly in creating what would become the Fresno Irrigation District, solutions to key issues were falling into place. One involved operational and legal structures that had often plagued the first irrigation districts. Those included poor planning, insufficient financial supervision and endless litigation challenging the enabling legislation, the Wright Act. Irrigation bonds offered by many early districts simply could not be sold. By 1915, the concept of public water had advanced sufficiently for irrigation districts to become viable alternatives to commercial and stockholder-owned water companies. Public agitation for a public system grew. The California Railroad Commission [predecessor of the Public Utilities Commission] regulated the canal company and had long been hearing complaints from Fresno landowners. In August 1919, petitions requesting the Fresno Irrigation District's formation began to be circulated. Citizen committees went to work to deal with organizational issues, not the least of which was the necessity of determining whether such a district could provide land - owners with water at a reasonable cost. At the same time, the Fresno Canal and Land Corporation asked the Railroad Commission to authorize increasing annual per ac. irrigation charges from 62.5 cents to $3.40 when its original water rights contracts expired February 16, 1921. Much controversy followed. Then it was learned that L.A. Nares, canal company president, actually supported establishment of an irrigation district. So did the company's English and Canadian investors who, it turned out, were seeking a way to shed their Central California water and land interests. Nares and Engineer I. Teilman became listed as active FID supporters. FID's organizational petition signed by 788 landowners went before the Fresno County Board of Supervisors on March 1, 1920 and several weeks later was set for election. On June 15, 1920, by a vote of 1,438-184, the Fresno Irrigation District gained approval. Its organization was made official by county supervisors on June 28. A day later, newly elected charter FID Directors M.F. Tarpey, E.J. Bullard. W.A. Groves. Herbert E. Vogel and P.B. Thornton met for the first time. Tarpey was elected president. The Fresno Irrigation District was reality. Private company control of Fresno's canals would soon be at an end.

As the Fresno Irrigation District opened up shop in the summer of 1920, for the Fresno Canal and Land Corporation it was pretty much business as usual. Not only did the canal company still own the Fresno canal system, the firm continued operations and water deliveries since FID essentially began with an empty treasury and no canals. An irrigation assessment roll had to be created, water charges levied and, to purchase the canal company's property, bonding had to take place. FID directors solved their immediate funding needs by borrowing $20,000, which was to be repaid by January 1, 1922. These borrowed funds were used to administer FID, compensate the canal company for operating the system and pay early costs of property acquisition. The District scheduled an election for February 8, 1921 to consider two bond measures — one for $1,725,000 to pay for the canals and property and the other for $250,000, with proceeds to be used for system improvements. Both measures passed overwhelmingly, the first by 1,568-74 and the second, 1,501-78. Only eight days later, on February 16, 1921, FID assumed canal operation. From the Fresno Irrigation District's earliest days in 1920, there was no shortage of maintenance requiring attention.[3] Bonds were sold in late April, and the title and water rights were transferred to FID on May 16, 1921. The district wasted no time in planning system improvements. Work was started in the fall of 1921 to improve a canal system filled with old wooden structures. Hundreds were considered unsafe. Most, including headworks of the Fresno and Gould canals, were inadequate. Top priority was given to replacing the dilapidated wooden structures with concrete construction. Work continued for five years as assessment revenue became available, adding up to $438,817 worth of projects. The two system headgates were replaced. More than 5,000 grower turnouts from canals and laterals were built. Later efforts were aimed at resolving seepage problems.

Collapse of the San Joaquin Valley's agricultural economy in the early 1920s may have put the brakes on Pine Flat Project development but impetus toward finding a solution to the Kings River's half-century old water rights issues gained rapid momentum in the same era. Struggles over who was entitled to divert Kings River water, and how much, had plagued the river's one million ac. service area practically since the region's settlement began in the 1850s. The old Fresno Canal and Irrigation Company had been a central force in moderating these disputes and achieving considerable, but hardly complete, water rights stability through its Rancho Laguna de Tache acquisition, which included a big part of the river's troublesome riparian rights. Still, old water rights animosities flared anew between 1911-13 when consecutive water years were critically dry. In 1914, they bumped up against the new public movements to build Pine Flat Dam and organize public irrigation districts. Debate by a committee, one that included no Kings River water managers or directors, resulted in a broader public decision to pursue a unified and cooperative course in search of water rights settlement. Many of those supporting an agreement recognized the Pine Flat Project otherwise might be brought to a permanent halt. By 1916, canal companies had accepted the public's escalating desire for negotiated Kings River peace. Within a year, most companies were submitting water diversion entitlement schedule ideas. Also understood was a need for a neutral third party to assist the long polarized Kings water companies in making studies. The state made available a water engineer, Charles L. Kaupke, who arrived in Fresno in December 1917 to help. Equipment was installed. Flow measurements were made. Data was recorded and analyzed. His work gained so much regional respect that Kaupke was designated the river's first Watermaster in 1919. That led to engineering efforts to devise a river-wide administrative structure, water apportionments and a trial entitlement diversion schedule. The first trial schedule, built upon the original 1897 low flow agreement for which the Fresno company had played a leading role, was in place by 1922. It soon proved successful. These advances not only effectively ended most Kings River water rights bickering but set the stage for a broader permanent agreement and water rights indenture. There were two key features included when 19 Kings River units gave approval on May 3, 1927: a comprehensive water schedule and a new organization. The Kings River Water Association, was formed in 1927 as an administrative agency, to be headed by a Watermaster. Kaupke was named to the position and served until his 1957 retirement. The Kings River Agreement took effect January 1, 1928. Given the Kings River's litigious past, it was a remarkable and decisive achievement.

[3] FID workers maintained the early irrigation system with horse-drawn Fresno scrapers, which was a local invention. They remained the primary maintenance equipment until bulldozers replaced them.

While a comprehensive historic context for the FID from 1920 to the present-day has not been developed, JRP Historical Consulting prepared the following:

> In the early 1920s the Fresno Irrigation District (FID) organized to incorporate much of the private irrigation operations of the area into one publicly-financed district, including the FC&IC. The old FC&IC water system had approximately 200 mi. of main canals in 1889; by the tum of the century those numbers had increased to 300 mi. of main canals, 1,000 mi. of branch canals, and 5,000 mi. of distributing canals. The area to be served by the new district was almost completely under cultivation when FID organized, but although the irrigation system it inherited was extensive, it was also rather primitive, consisting entirely of unlined earthen structures with an almost total lack of water flow control structures. FID immediately made erosion and irregular grade correction a major priority, and began replacing the old timber diversion works, headgates, and check weirs with concrete structures and lining canals with concrete to prevent seepage losses. Where grades were excessive, the old alignment was abandoned altogether. FLO also initiated an annual maintenance work program of cleaning and dredging the canals to improve its delivery system. Today, the FID covers approximately 245,000 ac. (Meta Bunse 2006:27).

The FID is comprised of a network of primary and secondary canals as well as sublaterals. Figure 6 shows the main conveyance canals of the current FID conveyance system.

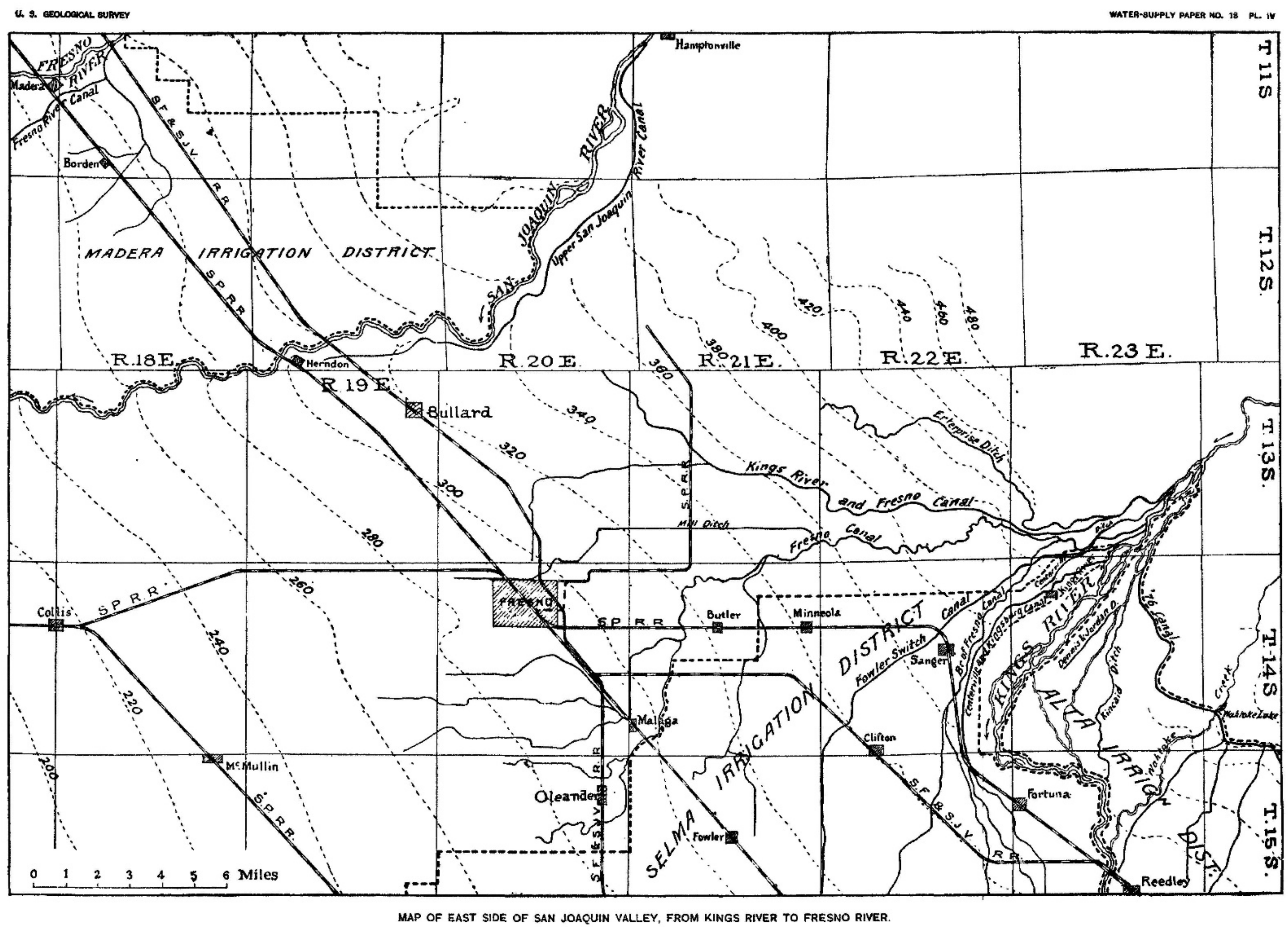

Figure 5. Map of the irrigation system for the east side of the San Joaquin Valley in 1898. Source: Grunsky 1898.

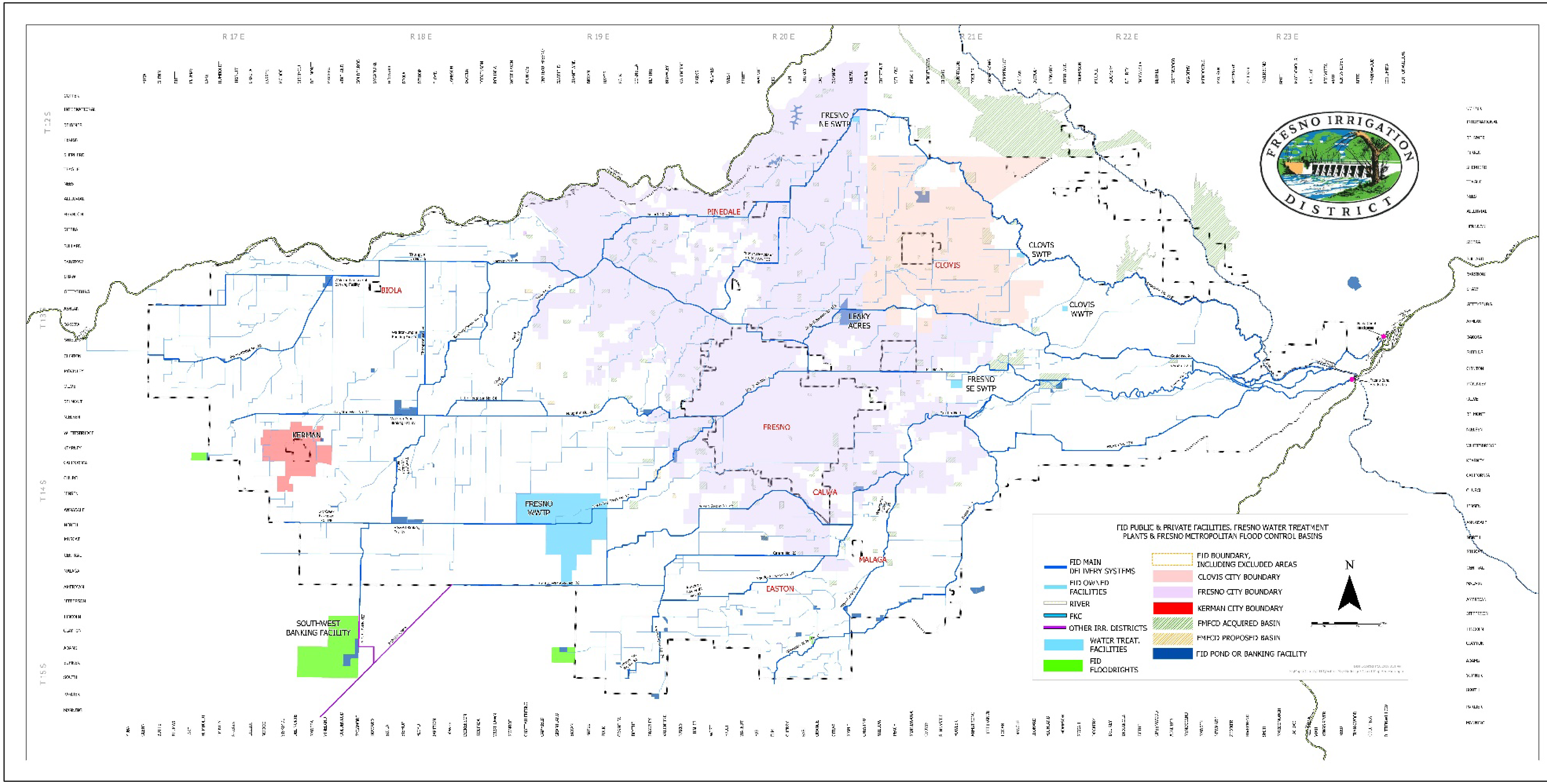

Figure 6. Map of the current FID system. Source: FID.

2.4.3 Houghton No. 78 (P-10-007097)

As part of the FID system, the Houghton Canal extends 15.74 mi. in a westerly direction from the Dry Creek Canal in the NE¼ NW ¼ SE ¼ of Section 5, T14S, R20E (ESA 2013). The canal segment within the APE is in the NW¼ of Section 3, T14S, R19E, MDB&M (Figure 7). Within the APE, it appears that there may have been an alignment alteration between 1885 and 1891, and 1891 and 1920 (Figures 8-10) (Hall 1885; Thompson 1891a; USGS 1923a). A 1942 aerial photograph shows that the canal segment within the APE retains the same alignment as it did in 1920. The width of the segment in the APE appears to be the same today as it was in 1942 (Fresno County Highways 1942; Google Earth 2022).

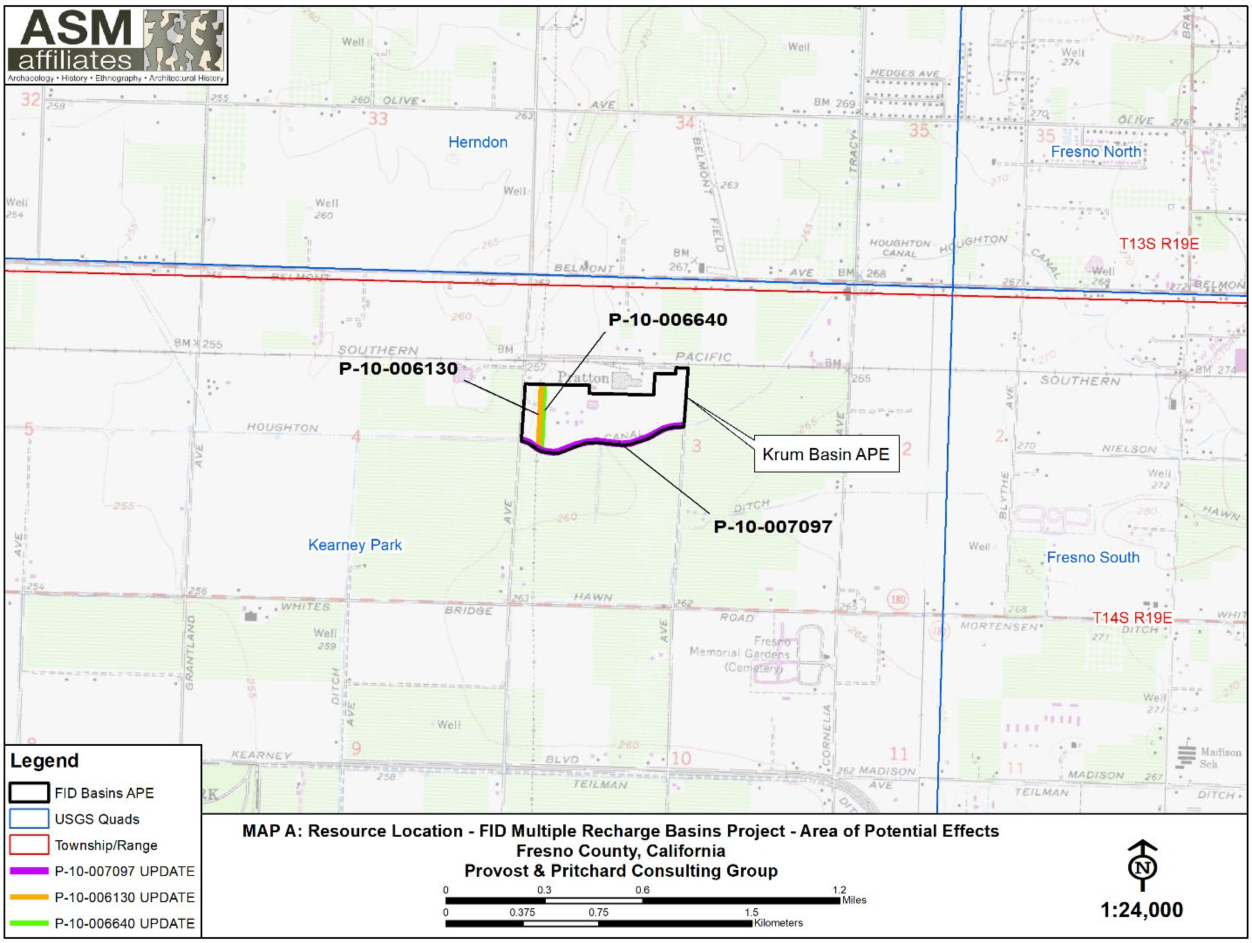

Figure 7. Recharge Basin Phase II Project that shows the segment of the Houghton Canal within the Krum Basin APE. No physical features of the electrical lines (P-10-006130 and P-10-006640) were identified in the APE other than the overhead lines.

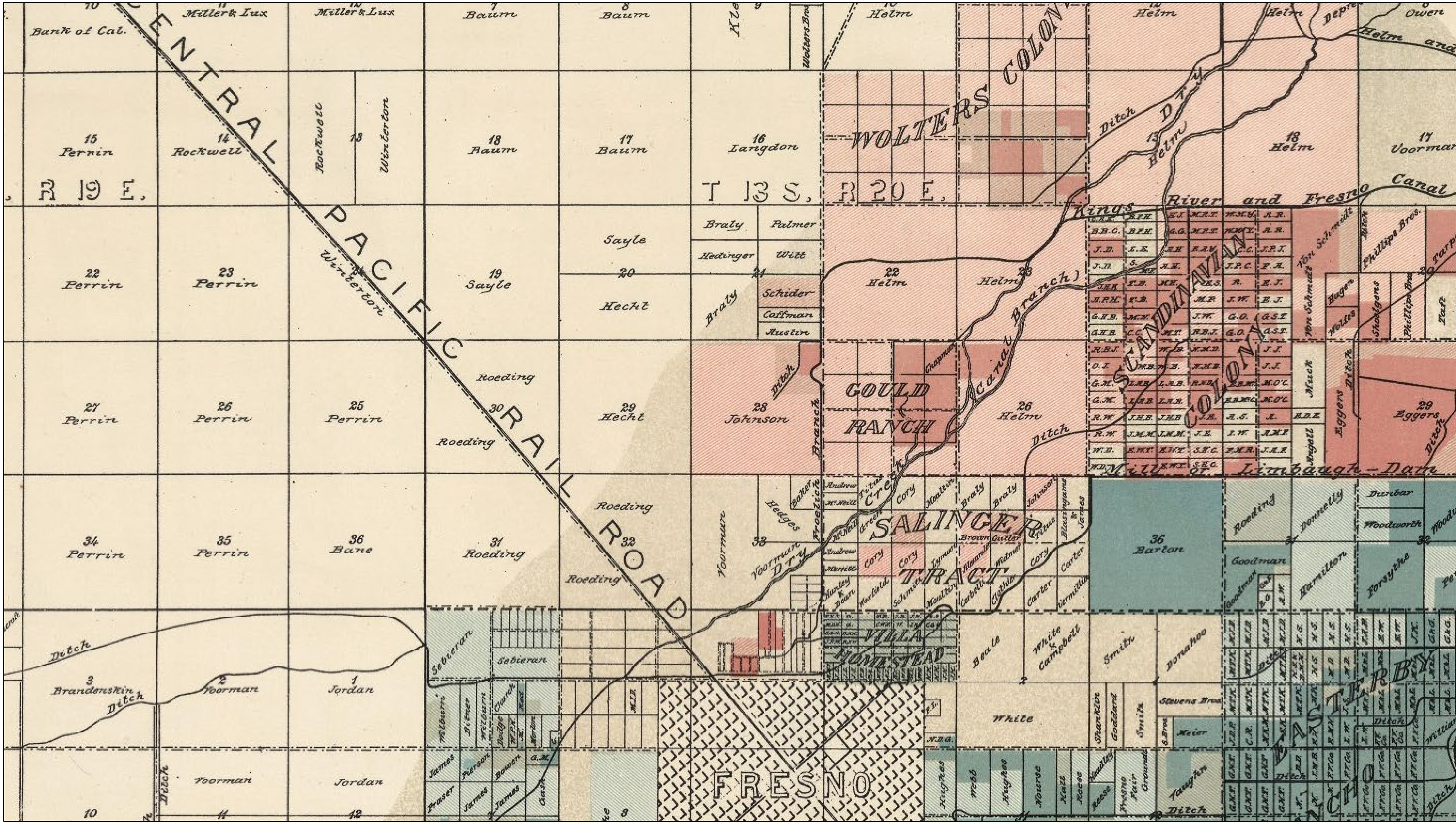

Figure 8. **1885 Map produced by California State Engineer William Hamilton Hall showing the irrigation data for the area. Note the alignment of the "Ditch" (Houghton Canal) through the N½ of Section 3, T14S, 19E. Source: David Rumsey Collection.**

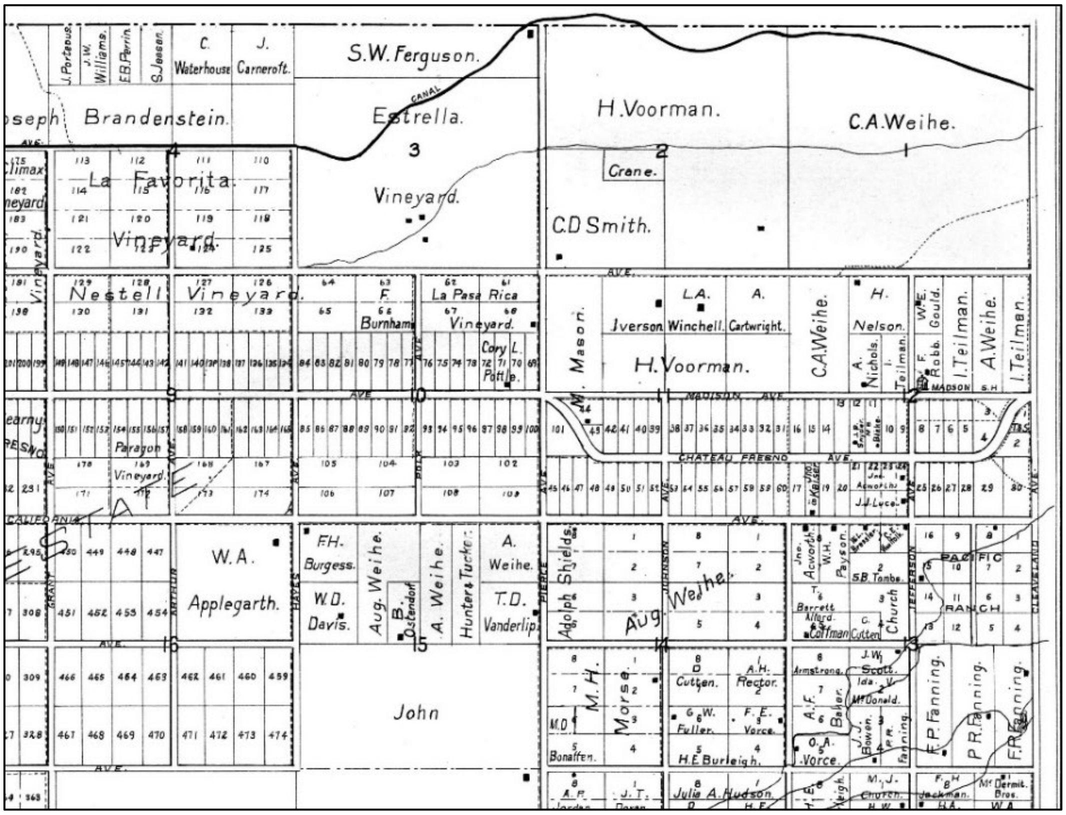

Figure 9. **Atlas Map of Fresno County, 1891. The Houghton Canal segment is the NW¼ of Section 3, T14S, R19E. Source: Fresno County Property Atlases Collection, Fresno County Library.**

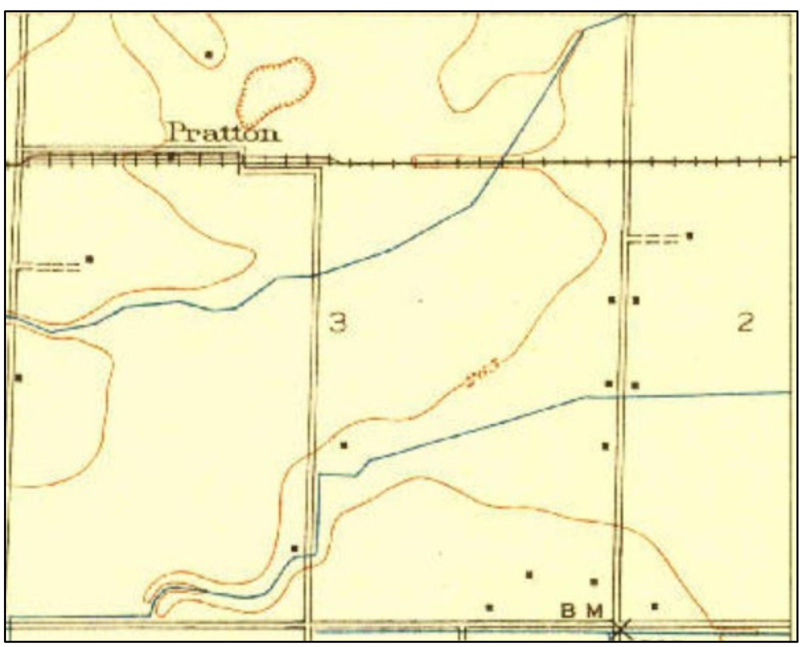

Figure 10. **A portion of the 1923 USGS map (surveyed in 1920) that shows Section 3, T14S, R19E. Source: United States Geological Survey.**

2.4.4 Central No. 23 Canal (P-10-004677)

As part of the FID system, the segment of Central No. 23 Canal within the APE is in the E½ E½ of Section 1, T15S, R19E, MDB&M (Figure 11). By 1885, no ditches or canals extend through Section 1, T15S, T19E (Figure 12) (Hall 1885). By 1891, an early alignment of a canal existed through the APE in an irregular pattern (Thompson 1891b). It appears that the alignment changed within Section 1, T15S, R19E between 1891 and 1921 (Figures 13 and 14) (Hall 1885; Thompson 1891a; USGS 1923b). The FID completely replaced the haphazard alignment with a more direct and linear alignment (USGS 1923b). By 1937, FID had realigned a short portion of the segment at the southern end of the APE (Fairchild 1937a). The alignment has remained the same since then.

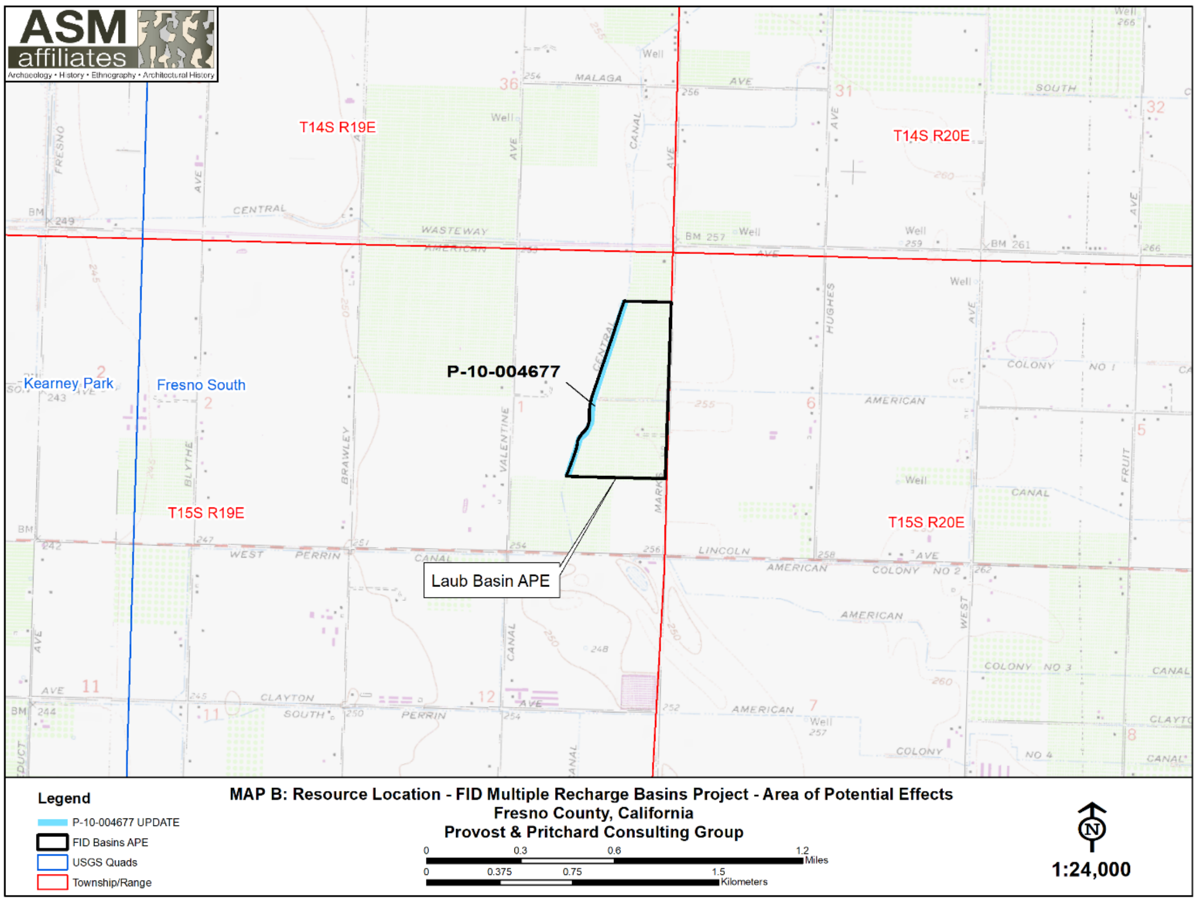

Figure 11. Recharge Basin Phase II Project map that shows the segment of the Central No. 23 Canal within the Laub Basin APE.

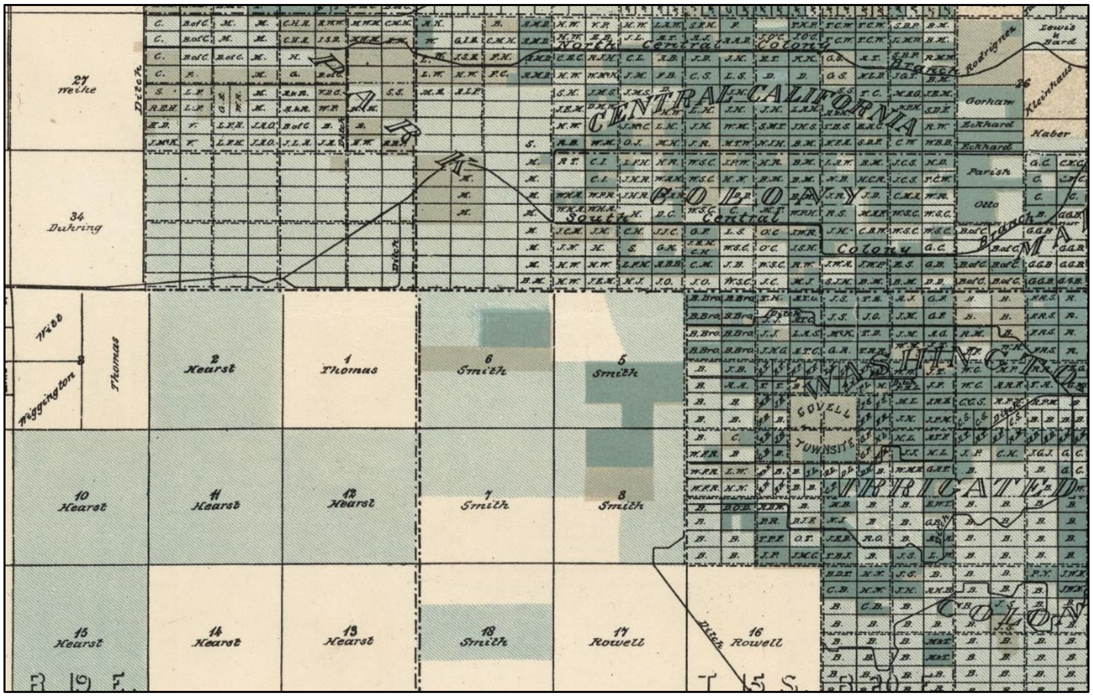

Figure 12. **1885 Map produced by California State Engineer William Hamilton Hall showing the irrigation data for the area. Source: David Rumsey Collection.**

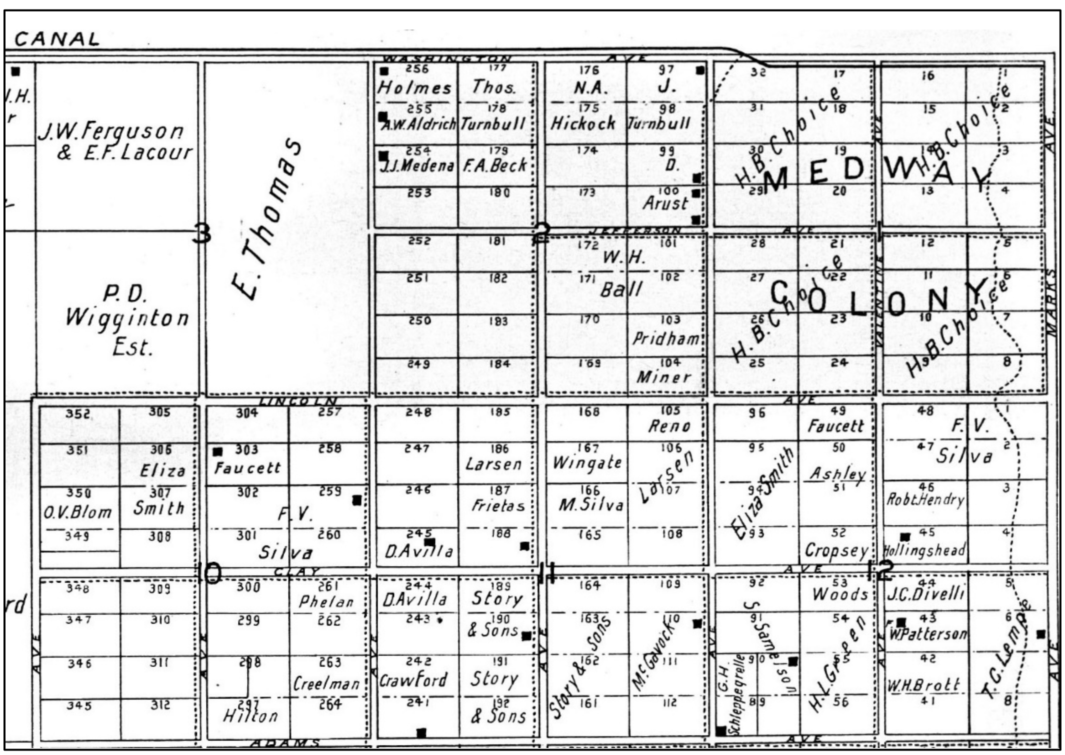

Figure 13. **Atlas Map of Fresno County, 1891. The Houghton Canal segment is the E½ E½ of Section 1, T14S, R19E. Source: Fresno County Property Atlases Collection, Fresno County Library.**

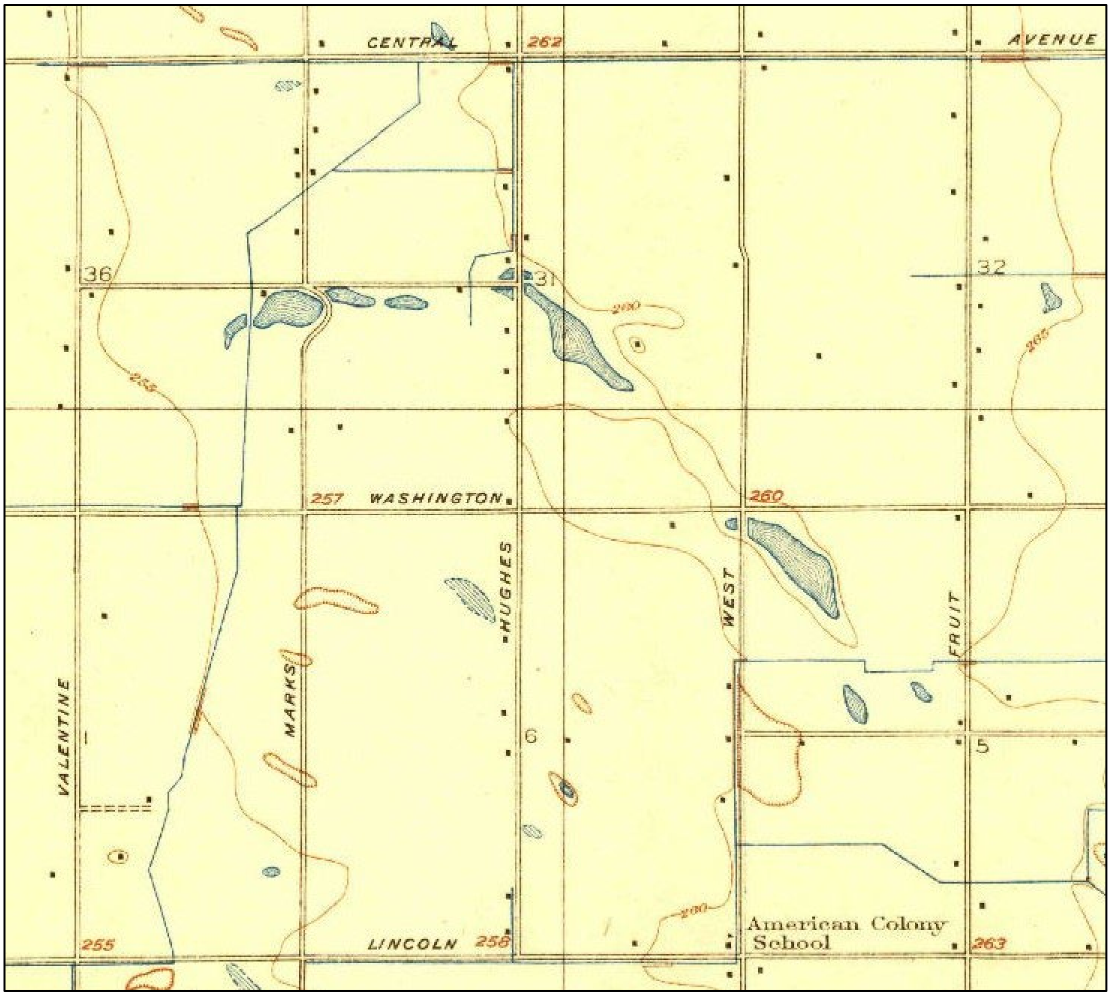

Figure 14. A portion of the 1923 USGS map (surveyed in 1921) that shows Section 1, T15S, R19E. Source: United States Geological Survey.

2.4.5 Hansen No. 129 (P-10-004724)

As part of the FID system, the segment of Hansen No. 129 Canal within the APE is in the NW¼ SW¼ of Section 12, T14S, R21E, MDB&M (Figure 15). In 1885, no ditches or canals extend through Section 12, T14S, T21E (Figure 16). By 1891, a curved alignment of the Hansen Canal had been constructed (Figure 17) (Hall 1885; Thompson 1891c). By 1921, the curves had been removed and the canal segment had been straightened (Figure 18) (USGS 1923c). It was likely constructed as part of an area-wide project undertaken as part of the newly established FID. The FID realigned the canal segment within the APE between 1937 and 1946 (Fairchild 1937b; USGS 1946). It retains that same alignment.

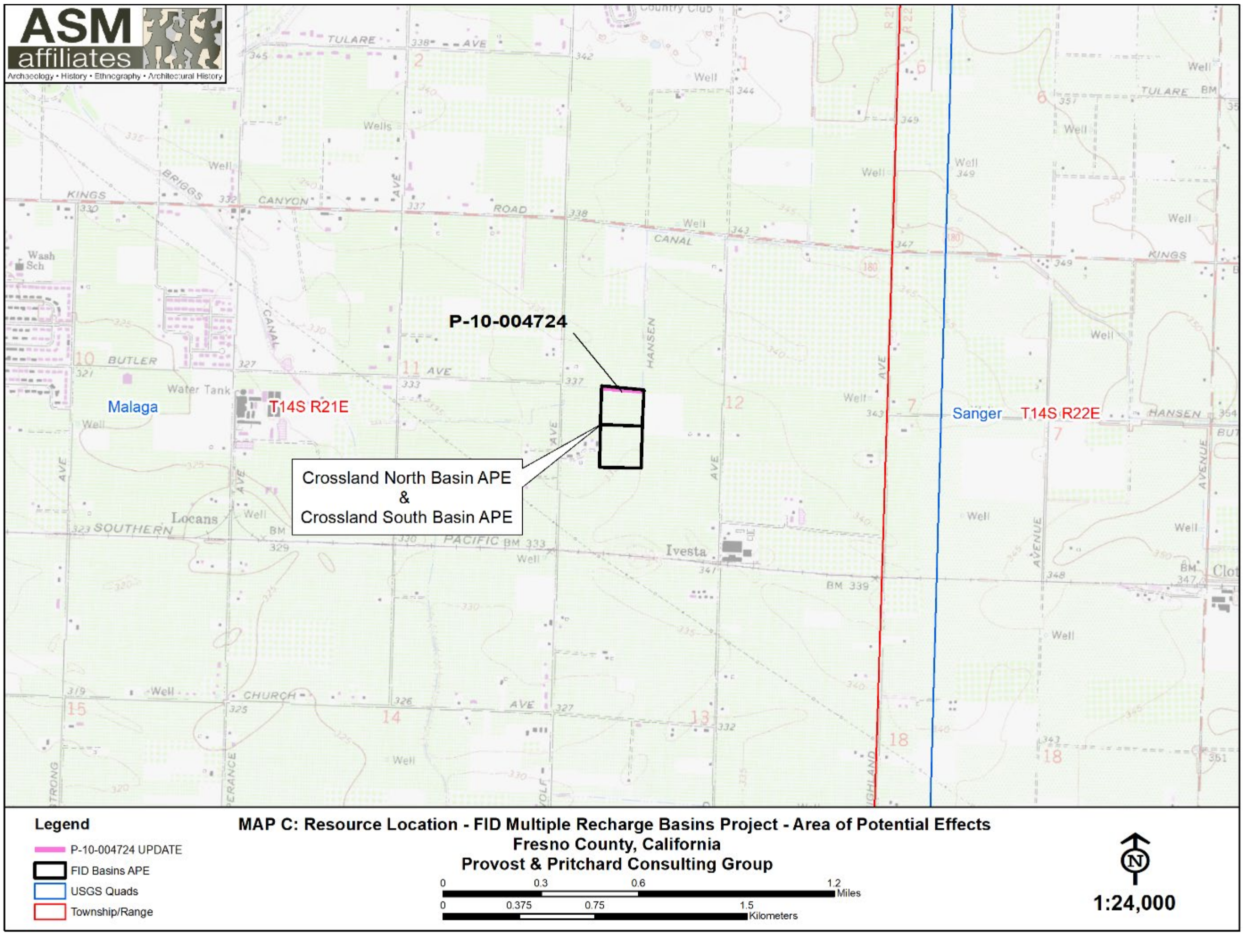

Figure 15. **Recharge Basin Phase II Project map that shows the segment of the Central No. 23 Canal within the Crossland Basin APE.**

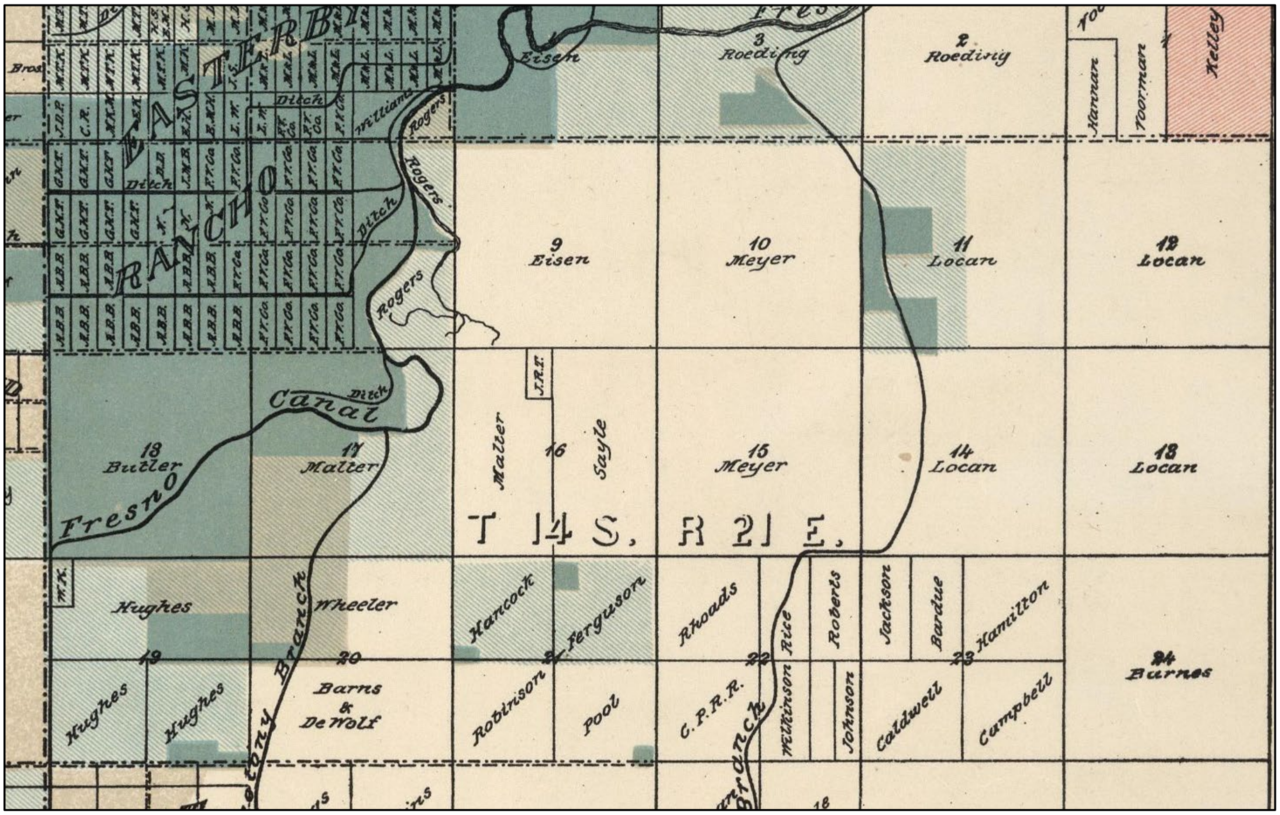

Figure 16. 1885 Map produced by California State Engineer William Hamilton Hall showing the irrigation data for the area. Source: David Rumsey Collection.

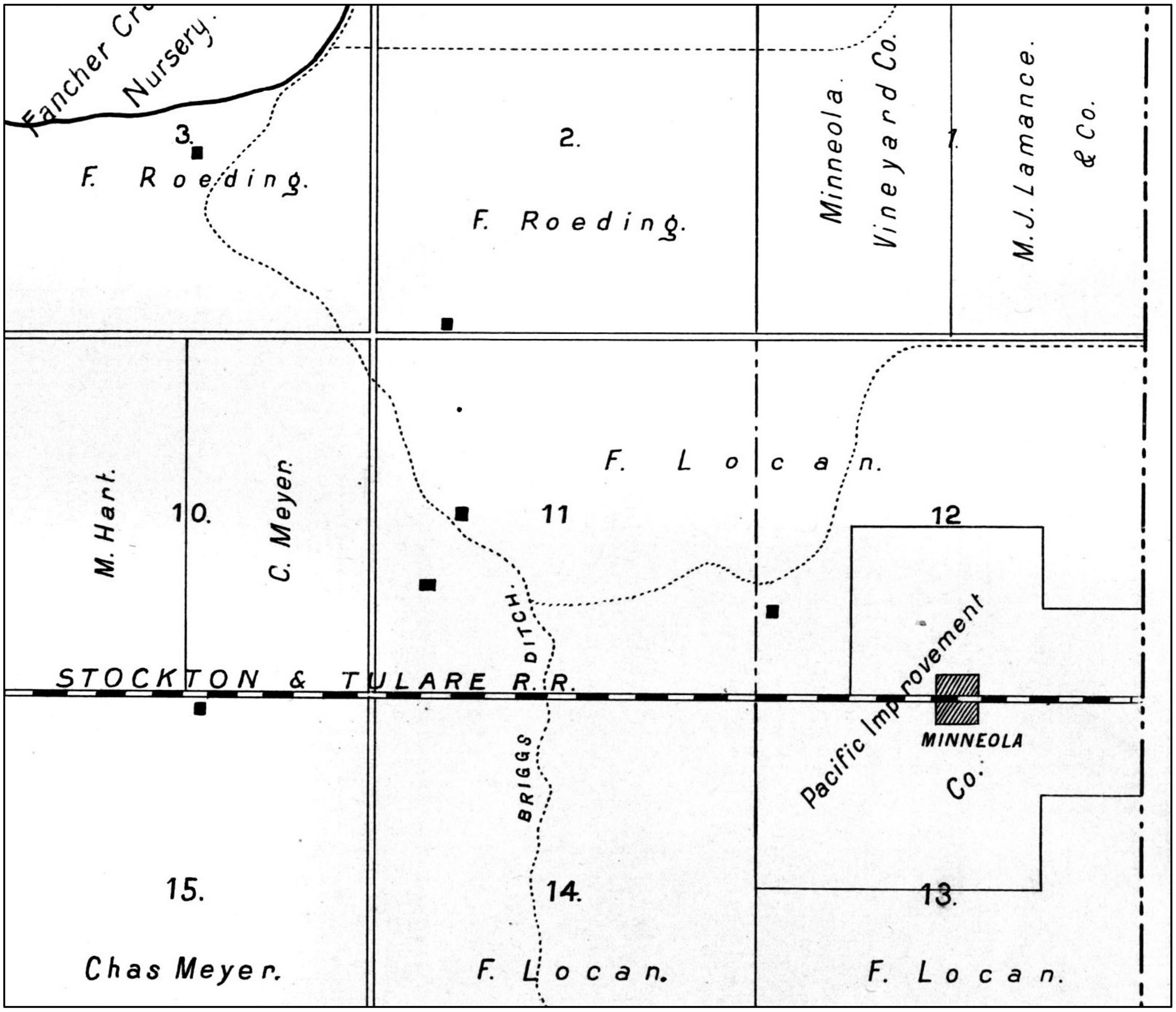

Figure 17. 1891 Atlas Map of Fresno County. The Hansen Canal segment extends through the W½ W½ of Section 12, T14S, R21E. Source: Fresno County Property Atlases Collection, Fresno County Library.

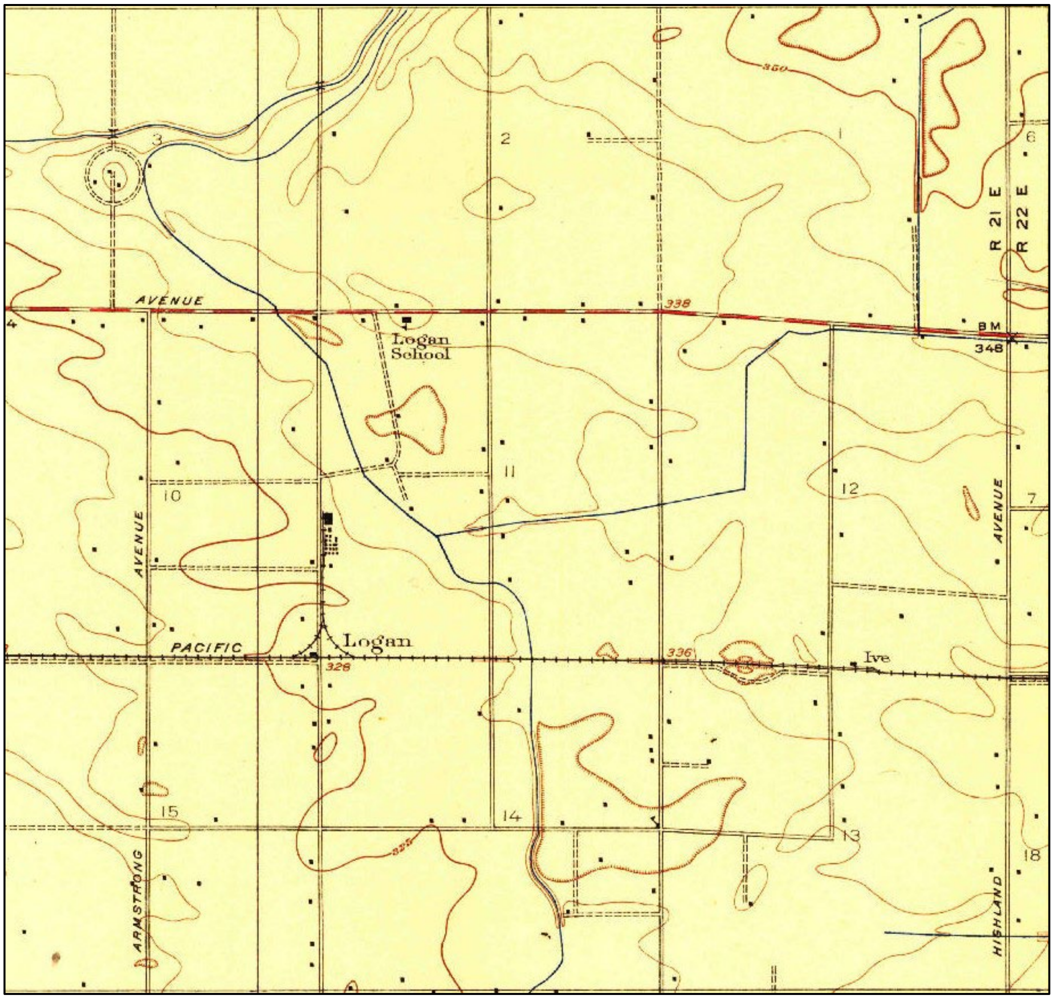

Figure 18. A portion of the 1923 USGS map (surveyed in 1921) that shows Section 12, T14S, R21E. Source: United States Geological Survey.

2.5 NRHP/CRHR CRITERIA FOR WATER CONVEYANCE SYSTEMS

The period of significance for historic water conveyance systems begins with the initial date of construction and considers any alignment changes that have been made over time. The period of significance must also consider the construction history of the linear systems, which may have been constructed and/or reconstructed or realigned by individuals, collectives, and/or irrigation districts and water companies over time.

Main Canals, Laterals, and Ditches

Main canals, laterals, or ditches can be individually eligible for the NRHP (Criteria A-D) and CRHR (Criteria 1-4). While the following criteria was developed for the Friant-Kern Canal, it is still applicable to smaller irrigation systems:[4]

Criterion A/1: They have had a significant impact on the settlement, agricultural economy, or development patterns of the project area; they have been defining elements in the evolution of the cultural landscape; they are directly associated with important events.

Criterion B/2: They are the result of the direct efforts of a prominent individual associated with the development of the local area or region and are the most prominent feature associated with that individual.

Criterion C/3: They represent the distinctive characteristics of canal design and/or methods of construction used during the period of construction, which may include solving engineering design problems due to topography, grade, length, natural obstacles, and resulted in complex or innovative solutions; they are among the best or a rare surviving example of a distinctive type of water conveyance structure; they represent the evolving technology in the engineering, design, and construction of water conveyance structures; they were identified during the construction period as an individually significant feature; or they embody the work of a significant engineer or builder.

Criterion D/4: They have the ability to yield information important to understanding the history of the local area or region that cannot be found in historical documentation.

Integrity

The need for continual maintenance and repairs to canals requires special consideration of integrity. Irrigation systems are constantly evolving as features are upgraded, repaired, or replaced. Alterations made to canals during the period of significance, and even subsequent thereto, may not nullify eligibility if a canal retains certain key qualities. Most important are integrity of location, association, and overall design configuration of the conveyance prism (i.e. depth and width) and water control features. A canal which has retained its original form and associated appurtenant features has a high degree of integrity. It is common for canal lining to be replaced, or for previously unlined segments to be lined. Such changes may not preclude a canal's eligibility if replacement features are in-kind, or they do not significantly damage the canal's historic association or its overall design. If, in addition to integrity of association, location, and overall design, the historical setting and feeling of a canal are maintained, then the likelihood is even higher that an altered canal could remain eligible. On the other hand, if an entire canal is piped, it would no longer convey any of its original design, workmanship, materials, or historical association and would not be contributing. Conversely, partial piping of a significant canal may not preclude eligibility if a majority of a canal is still open and intact.

[4] The section has been excerpted and adapted from Heather K. Norby and Stephen R. Wee, *Historic Property Survey Report: Friant Kern Canal*, JRP Historical Consulting, 2019:52-53.

Appurtenant Canal Features[5]

Although appurtenant canal features are all operationally and thematically related to canals/laterals/ditches, each feature type serves a specific purpose. These features can be divided into five categories of structures: conveyance, regulating, protective, water measurement, and bridges. The first four of these types were built to function as part of the canal, while the bridges were built to function independently of the canal.

1. Conveyance Structures
Conveyance structures are features such as inverted siphons, drops, chutes, flumes, tunnels, and pipelines that are used to safely transport water from one location to another traversing various existing natural and manmade topographic features along the way. There are two types of pipelines, those that carry water below ground and those that carry water above ground.

2. Regulating Structures
Regulating structures are used to raise, lower, or control the release and volume of the water flow. Regulating structures that are located at the source of the water supply include headworks and turnouts. Headworks control the release of water into the canal, and they are often located downstream from a major diversion or storage facility. Regulating structures located along the course of a canal include turnouts, checks, check-drops, radial gates, reservoirs, and diversion structures. The smaller regulating structures like checks and turnouts are basic components of an irrigation system.

3. Protective Structures
Protective structures protect the canal system and adjacent property from damage which would result from uncontrolled storm runoff or drainage water, or an uncontrolled excess of flow within the canal. Several different types of structures perform this function, including overchutes, drainage inlets, siphon spillways, and wasteways.

4. Water Measurement Structures and Objects
Water measurement structures are used to gauge water flow and ensure its equitable distribution. Many different types of water measurement structures are used in irrigation systems.

5. Bridges
Bridges crossing canals range from single lane bridges, multi-lane highway bridges, farm bridges, pedestrian bridges, and maintenance bridges.

Significance

Secondary to the canals in distributing water are the thousands of appurtenant features. With the exception of bridges, these appurtenant features are important to the overall operation of the main

[5] The section has been excerpted and adapted from Heather K. Norby and Stephen R. Wee, *Historic Property Survey Report: Friant Kern Canal*, JRP Historical Consulting, 2019: 53-54.

canals, yet are too small in size and repetitive in design to merit individual eligibility. Even though bridges cross canals and can be physically tied to the canal prism, bridges have no connection to the operation of the SSJID and therefore merit separate evaluation from other appurtenant features. Bridges would rarely be individually eligible for the NRHP or CRHR in association with this historic context.

Registration Requirements

Appurtenant canal features can be eligible for listing in the NRHP and the CRHR for the following reasons:

Criterion A/1: They are directly associated with important events that occurred along canals;

Criterion B/2: not applicable;

Criterion C/3: They are among the best or a rare surviving example of a distinctive type of appurtenant canal feature; they represent the evolving technology in the design of appurtenant canal features; they represent a unique design solution developed in response to a difficult engineering challenge; they were identified during the construction period as an individually significant feature;

Criterion D/4: They have the ability to yield information important to understanding the history of the system.

Integrity

As with canals, many appurtenant features are upgraded, altered, or even replaced over time due to the constant ongoing maintenance needs. Integrity of a structure's historic materials, workmanship and design is essential for National Register eligibility under any criterion. Location is of primary importance under Criterion A and C – a structure will rarely qualify under this criterion if it does not remain on its historic site along its associated canal.

Historical structures are typically evaluated for NRHP eligibility under Criteria A and/or B, for their associative values with major historical trends or individuals, and Criteria C for potential design or engineering importance. Conveyance systems are typically eligible for listing in the NRHP under Criteria A and/or C.

The CRHR Criteria and registration requirements for conveyance systems mirror the NRHP Criteria and registration requirements. Conveyance systems are typically eligible for listing in the CRHR under Criteria 1 and/or 3.

The period of significance for Settlement through Agriculture begins with the earliest development of irrigated agriculture in the San Joaquin Valley, with the construction of the earthen ditches in Visalia in 1852. Irrigated agriculture continues to be an important industry and influence in the Valley. The period of significance ends in 1973 following recommended guidance for closing a period of significance when activities continued to have importance, but no more specific date can be defined to end the historic period, and there is no justification for exceptional significance to extend the period of significance to an end date within the last 50 years (National Register of Historic Places 1997).

3. RECORDS SEARCH

A records search was conducted at the California State University, Bakersfield, Southern San Joaquin Valley Information Center (SSJVIC), by SSJVIC staff members on 12 December 2023 to determine: (i) if prehistoric or historical cultural resources had previously been recorded within the APE; (ii) if the APE had been systematically surveyed by archaeologists prior to the initiation of this field study; and/or (iii) whether the region of the Project was known to contain archaeological sites and to thereby be archaeologically sensitive. Additionally, a search of the Native American Heritage Commission (NAHC) *Sacred Lands File (SLF)* was conducted to ascertain whether traditional cultural places or cultural landscapes had been identified within the APE.

According to a records search of the SSJVIC, three previous studies have been conducted within the Project APE (Table 1) and six cultural resources are known to exist within it (Table 2). An additional five surveys had been completed within 0.5-mi of the Project APE (Table 3), resulting in the recordation of three cultural resources within that outer radius (Table 4). The results of this records search are summarized here and are available in Confidential Appendix A

A search of the NAHC SLF was completed on 12 January 2024. Based on the NAHC records, no sacred sites or traditional cultural places had been identified within or adjacent to the APE (Appendix B). Outreach letters and follow-up emails were sent to tribal organizations on the NAHC contact list. Aso of March 2024, no responses have been received.

Based on the records search and other sources, the APE appeared to have low archaeological cultural resources sensitivity.

Table 1. Previous Reports in the APE

Report No.	Year	Author (s)/Affiliation	Title
FR-02501	2008	Binning, Jeanne/California Department of Transportation	Historic Property Survey Report for Route 180 Planned Westside Expressway from I-5 to Valentine Ave, Fresno, Fresno County, California
FR-02505	2006	Leach-Palm, Laura, Rosenthal, Jeffrey, Byrd, Brian, Mikkelson, Pat, and Waechter, Sharon/Far Western Anthropological Research Group, Inc.	Preliminary Assessment of the Archaeological Sensitivity for the Route 180 Westside Expressway Route Adoption Study Between Interstate 5 and the City of Fresno, Fresno County, California Interstate 5 PM 9.0 (KP 14.5) to 06-FRE-180 PM 54.2 (KP 87 Valentine Avenue) EA06-451400
FR-02506	2006	Brady, Jon and Bunse, Rebecca/California Department of Transportation	Final Historic Resources Sensitivity Study Route 180 Westside Expressway Route Adoption Study

Table 2. Previous Resources in the APE

Primary #	Type	Description
P-10-004303	District	Japanese farming community
P-10-004677	Structure	Segment of the Fresno Canal
P-10-004724	Structure	Hansen Ditch
P-10-006130	Structure	Herdon-Kearney Transmission Line
P-10-006640	Structure	Gates-Gregg 230 kV Transmission Line
P-10-007097	Structure	Houghton Canal

Table 3. Previous Reports within 0.5 mi. of the APE

Report No.	Year	Author (s)/Affiliation	Title
FR-02059	2005	Billat, Scott/EarthTouch, Inc.	Request for SHPO Review of FCC Undertaking (Ivesta/CA-1663D)
FR-02414	2010	Leach-Palm, Laura, Brandy, Paul, King, Jay, Mikkelson, Pat, Seil, Libby, Hartman, Lindsay, and Bradeen, Jill/Far Western Anthropological Research Group, Inc., Davis and JRP Historical Consulting, LLC, Davis	Cultural Resources Inventory of Caltrans District 6 Rural Conventional Highways in Fresno, Western Kern, Kings, Madera, and Tulare Counties Summary of Methods and Findings
FR-02453	2002	Unknown/California Department of Transportation	Second Supplemental Historic Property Survey Report 180 East Rural Expressway Reevaluation - Fowler Avenue to Cove Avenue Fresno County, California
FR-02507	1992	Mikesell, Stephen D. and Wee, Stephen R./ Woodward-Clyde Consultants	Historic Architectural Survey Report for the Rural Highway 180 Project Fowler Avenue to Cove Avenue, Fresno County, California
FR-02722	2015	Anderson, Katherine and Vader, Michael/ESA Cultural Resources	Fresno Recycled Water Distribution System Project, Phase I Cultural Resources Study, Fresno County, California

Table 4. Previous Resources within 0.5 mi. of the APE

Primary #	Type	Description
P-10-003930	Structure	Biola Branch Extension Railroad
P-10-005464	Building	Farm
P-10-006048	Building	Residence dwelling

3.1 PREVIOUS EVALUATIONS OF RESOURCES WITHIN THE APE

P-10-004303, Japanese farming community

Bowles, a Japanese farming community, began in 1902 when Japanese immigrants first purchased the available land west of Highway 41. By 1910, it had become a thriving agricultural community that grew barley and grain crops as well as vineyards. Financial impacts caused by the Great Depression in the 1930s and the internment of Japanese-Americans during World War II significantly impacted the Japanese community, yet they persisted and remained an agricultural community until at least the 1980s. No irrigation systems or features were identified in association with this community (Waugh 1980). However, it should be considered for evaluation of historical resources associated with farmland in the area.

P-10-004677, Fresno Canal

Central No. 23 Canal has been historically known as the Fresno Canal, Fancher Creek Canal, and Central Canal, which was constructed by 1876. Karana Hattersley-Drayton evaluated a 967 ft. segment of the Central Canal and recommended it eligible for listing in the NRHP under Criterion A for its "association with the development of agriculture and colonies in the Fresno area with a period of significance of circa 1874-1964" (Hattersley-Drayton and Johnson 2021). In 2004, JRP Historic Consulting evaluated three segments (two earthen and one concrete-lined segments) and recommended the segments not eligible for listing in the CRHR under Criteria A-D for the period of significance of 1875 to 1920 due to changes made to the segments over time (JRP Historical Consulting 2004). In 2003, J & R Environmental Services evaluated a segment of the canal and recommended it is not eligible for listing in the NRHP or CRHR for Criteria A-D/1-4 (J & R Environmental 2003). In 2000, CRM Tech recorded a portion of the Fresno Canal and indicated it may be a contributor to a historic district for the Central California Colony following a comprehensive evaluation (CRM Tech 2000).

P-10-004724, Hansen Ditch

In 2001, Applied EarthWorks evaluated an unlined segment of the Hansen (Hanson) Ditch at the intersection of Academy Avenue and Kings Canyon Street (Highway 180) in Fresno and recommended it eligible to the NRHP and the CRHP under Criterion A/1 for "association with the growth of Fresno County agriculture" and under Criterion C/3 for "nineteenth and early twentieth century engineering" (Applied EarthWorks 2001). In 1991, JRP Historical Consulting recorded five points along a five mi. segment of the Hansen (Hanson) Ditch. While JRP did not formally evaluate the ditch segment, the conclusion was that this segment had been modified over time as necessary for the distribution needs of the FID (JRP Historical Consulting 1991).

P-10-006130, Herdon-Kearney Transmission Line

The Pacific Gas & Electric Company constructed the transmission line between 1946 and 1963 (LSA 2010). In 2020, Applied EarthWorks recorded a 1,737 ft. segment of the transmission line, but did not formally evaluate it (Applied EarthWorks 2020a). In 2010, LSA evaluated a one mi.

segment of the transmission line in the SE¼ of SE¼ of Section 4, T13S, R19E. LSA recommended it not eligible to the NRHP or CRHR under Criteria A-D/1-4 (LSA 2010).

P-10-006640, Gates-Gregg 230 kV Transmission Line

The Pacific Gas & Electric Company constructed the 57 mi. transmission line between 1956 and 1961 (Applied EarthWorks 2016). In 2020, Applied EarthWorks recorded a segment of the transmission line just west of North Hayes Avenue, nearly parallel to the road, just north of the intersection with Dakota Avenue, but did not formally evaluate it (Applied EarthWorks 2020b). In 2016, Applied EarthWorks evaluated a 16 mi. segment of the 57 mi. transmission line and recommended it not eligible to the NRHP or CRHR under Criteria A-D/1-4 (Applied EarthWork 2016).

P-10-007097, Houghton Canal

In 2013, ESA evaluated an earthen and concrete-lined segment of Houghton Canal west of Fresno in Section 35, T13s, R19E at Belmont Avenue. Based on limited archival documentation, ESA recommended it not eligible for listing in the CRHR. While it derived from the late nineteenth century development of irrigation canals, ESA argued that more significant examples exist such as Centerville, Gould, and Enterprise canals. A realignment at Belmont Avenue for a culvert and crossing impacted its integrity (ESA 2013).

ASM confirmed that Reclamation does not have additional evaluations or SHPO concurrence documentation for the Central No. 23/Fresno Canal (P-10-004677), Hansen Ditch (P-10-004724), and Houghton Canal (P-10-007097).

4. METHODS AND RESULTS

An intensive Class III inventory/Phase I survey of the Project APE was conducted on January 24, 2024, by ASM Field Director Robert Azpitarte, B.A., assisted by ASM Assistant Archaeologists Maggie Lemus, B.A., and Maria Silva, B.A. The APE was examined with the field crew walking parallel transects space at approximately 15 meter (m.) intervals, in order to identify surface artifacts, archaeological indicators (e.g., shellfish or animal bone), and/or archaeological deposits (e.g., organically enriched midden soil); tabulation and recording of surface diagnostic artifacts; site sketch mapping; preliminary evaluation of site integrity; and site recording, following the California Office of Historic Preservation Instructions for Recording Historic Resources, using DPR 523 forms. Special attention was paid to rodent burrow back dirt piles, in the hope of identifying sub-surface soil conditions that might be indicative of archaeological features or remains.

4.1 SURVEY RESULTS

Five of the six previously recorded cultural resources identified within the APE were re-located and their site records were updated. Site records updates for those five cultural resources are included in Confidential Appendix C and include photographs of the sites. Maps of resource locations are in Confidential Appendix A. No archaeological materials or built environmental features associated with the Japanese farming community (P-10-004303) were observed. In addition, no new cultural resources were observed.

4.1.1 Previously Recorded Resources:

Krum Recharge Basin APE

An agricultural field with adjacent residential properties and paved roads. A cluster of buildings that had been identified on contemporary aerial photographs were no longer extant at the time of survey. A modern transmission line bisects the basin in an east-west direction. Three previously recorded resources within this APE were identified:

P-10-006130 Herdon-Kearney Transmission Line

No ground components of this linear resource segment were observed within APE (Figure 19).

P-10-006640 Gates-Gregg 230 kV Transmission Line

No ground components of this linear resource segment were observed within APE (see Figure 19).

P-10-007097 Houghton Canal (segment)

ASM recorded a 2,759 ft. earthen segment of the Houghton Canal. On the west end of the segment, a modern concrete bridge with a square culvert measures 12 ft. x 5 ft. No dates are inscribed. It appears to be modern (Figure 20).

The 2,759 ft. segment of the Houghton Canal retains a partial trapezoidal-shaped canal prism with a more defined southern canal wall slope with intermittent riprap placed on sloped canal walls (Figure 21). An adjacent 15 ft. dirt road provides access to the canal on either side.

One check gate is extant at the midpoint of the recorded segment with four chutes and no gates. It appears that the check gate could be from the 1910s-1920s based on aggregate materials in the concrete and check gate design. Adjacent to the check gate are two manual hoist turnout gates on the north and south sides (Figures 22 and 23). The northern turnout appears to retain a historic hoist though the slide is modern. The southern turnout frame and hoist appears to be modern. On the southern side near the check gate is a well pump and fenced treatment tanks (Figure 24).

On the east end, the modern concrete bridge includes a square culvert opening that measures 10 ft. by 5 ft. No dates are inscribed (Figure 25).

Figure 19. Overview of Herdon-Kearney Transmission Line and Gates-Gregg 230 kV Transmission Line, facing south.

Figure 20. Bridge and culvert on west end of Houghton Canal segment, facing north.

Figure 21. Houghton Canal at center of canal bed, facing east.

Figure 22. Check gate within Houghton Canal segment, facing north.

Figure 23. Check gate within Houghton Canal segment, facing slightly southeast.

Figure 24. Bridge and culvert on east end of Houghton Canal segment, facing west.

Figure 25. Bridge and culvert on east end of Houghton Canal segment, facing southeast.

Laub Recharge Basin APE

An agricultural field with additional adjacent agricultural properties and paved roads One previously recorded historic resource was rerecorded:

P-10-004677 Central No. 23/Fresno Canal (segment)

ASM recorded a 1,505 ft. earthen segment of the Central No. 23/Fresno Canal. The trapezoidal-shaped canal prism appears to be mechanically maintained with sharp sloped walls and a clearly defined bed. Dirt roads parallel the canal on either side and range from 12 ft. to 25 ft. wide.

There are two turnouts within this segment: Turnout 23 and an unnumbered turnout. While both turnouts retain manual hoist gates, Turnout 23 retains a concrete headgate, and the unnumbered turnout does not. Pumps and standpipes were extant near Turnout 23 (Figures 26-29).

Figure 26. Turnout 23, facing northwest.

Figure 27. Pump and standpipe near turnout 23, facing southeast.

Figure 28. Turnout, facing west.

Figure 29. Pump and standpipe near turnout 23, facing southeast.

Crossland North and South Recharge Basin

An agricultural field with adjacent residential properties and additional agricultural fields/orchards. One previously recorded historic resource was rerecorded:

P-10-004724 Hansen Ditch (segment)

ASM recorded a 742 ft. earthen segment of the Hansen Ditch. The only structure within this segment is a single-barrel turnout with a modern concrete headgate and modern hoist gate (Figures 30-32). Dirt roads run adjacent to the ditch on either side and range from 12 ft. to 25 ft. wide. The Hansen ditch/canal remains as originally documented. Some modern trash is potentially associated with canal repairs.

Figure 30. Hansen Ditch segment (beginning) and turnout on the southern bank, facing southeast.

Figure 31. Turnout on Hansen Ditch segment with concrete headgate and modern manual hoist gate, facing slightly south.

Figure 32. View of Hansen Ditch (segment) at curve near the end of the segment, facing west.

5. SUMMARY AND RECOMMENDATIONS

An intensive Class III inventory/Phase I cultural resources survey was conducted for the Recharge Basin Phase II Project, Fresno County, California. A records search of site files and maps was conducted at the SSJVIC and a search of the NAHC *Sacred Lands File* was completed. No Native American sacred sites or cultural landscapes had been identified within or immediately adjacent to the study APE, and no archaeological sites had been recorded within the APE.

The survey fieldwork of the 154 ac. APE was conducted on January 24, 2024, with parallel transects spaced at approximately 15 m. intervals walked across the APE. Five of the six previously recorded cultural resources – Segment of the Fresno Canal (P-10-004677), Segment of the Hansen Ditch (P-10-004724), Herdon-Kearney Transmission Line (P-10-006130), Gates-Gregg 230 kV Transmission Line (P-10-006640), and Segment of the Houghton Canal (P-10-007097) – were revisited and their site records updated. ASM did not identify any potential historical resources associated with the Japanese farming community historic district (P-10-004303), which had been previously recorded within the APE.

5.1 NRHP/CRHR EVALUATION

An intensive Class III inventory/Phase I survey determined that three historic resources are located within the APE that would be potentially impacted by the proposed project: a segment of the Houghton Canal (P-10-007097), a segment of Central No. 23/Fresno Canal (P-10-004677), and a segment of the Hansen Ditch (P-10-004724). Therefore, an evaluation for NRHP and CRHR eligibility is warranted. Segments of all three canals have been previously recorded and evaluated (see Section 3.1). As such, ASM considered whether the segments of the Central No. 23/Fresno Canal (P-10-004677), Hansen Ditch (P-10-004724), and Houghton Canal (P-10-007097) (see Figures 7, 11, 15) are eligible under any NRHP/CRHR criteria.

NRHP evaluations of other main canals within the FID system and SHPO concurrence with the findings of those evaluations provide precent for evaluating a segment of the Central No. 23/Fresno Canal (P-10-004677), a segment of the Hansen Ditch (P-10-004724), and a segment of the Houghton Canal (P-10-007097). Previous evaluations indicate that late nineteenth-century canals within the system are consistently considered eligible or assumed eligible for proposed basin recharge projects deemed as undertakings. An example is the Oleander Canal (ca. 1881), which was treated as eligible under Criterion A for its agricultural contribution to the Central Valley. The canal was part of an undertaking project for two proposed recharge basins that included a new diversion structure from the Oleander Canal to the recharge basins via a buried pipeline and included a new turnout and extraction well. For that project, Reclamation and SHPO recognized that buried pipelines to proposed recharge basins are a "standard type of water conveyance facility modification or upgrade" with minor effects that do not alter character-defining features of the NRHP-eligible canals (Leigh 2010; Stratton 2010). Gould Canal was also treated as individually eligible for listing in the NRHP under Criteria A for its "association with the theme of early Fresno County irrigation and agriculture" for the proposed undertaking of "constructing a pump station in the Gould Canal with a steel pipeline and a concrete discharge structure into the FKC." The FKC is a determined eligible resource under Criterion A with SHPO concurrence (Polanco 2016). Given that the project parameters use "simple materials and plain design of the new facility will not unduly detract from the visual and physical characteristics of the adjacent linear canals," SHPO concurred with Reclamation that the undertaking would result in no adverse effect (Polanco 2016).

In those previous evaluations, Reclamation assumed eligibility for nineteenth century canals that were absorbed into an expansive irrigation system (FID). SHPO concurred. In addition, Reclamation determined and SHPO concurred that the proposed recharge basin projects were in line with expected modifications within an irrigation district, and it did not impact character-defining features. Therefore, Reclamation had assumed eligibility for such projects. A comprehensive historic context for the FID system (1920-1974) has not been completed to date nor has an evaluation of the entire system during the FID era. As such, ASM applied the precedent of assumed eligibility to the evaluation of the three canal segments within the APEs based on the historical significance of the FID system for the San Joaquin Valley. Given that SHPO has concurred with previous assumed eligibility recommendations for recharge basin undertakings because canals will not be significantly affected by the proposed projects, ASM applied those set precedents to the evaluation of the three canal segments within the APEs.

Houghton Canal (P-10-007097)

The segment of the canal within the APE would be potentially assumed eligible under Criterion A/1 for the period of significance of 1874-1919 for early irrigation infrastructure for agricultural development on the east side of the San Joaquin Valley and as part of the FID system 1920-1974. The canal is not specifically associated with one individual as it was constructed as part of an irrigation collective. Therefore, ASM recommends this segment of the canal is not eligible under Criterion B/2. This segment of the canal would be potentially assumed eligible under Criterion C/3 for the period of significance of 1874-1919 for early irrigation development for agricultural production on the east side of the San Joaquin River and as part of the FID system 1920-1974. This segment of the canal does not have the potential to provide information about history or prehistory that is not available through historic research. ASM recommends this segment of the canal is not eligible under Criterion D/4.

Integrity

For conveyance features, an integrity assessment is dependent on the retention of the alignment within the period of significance. The alignment of the segment of the Houghton Canal within the APE was likely altered between 1885 and 1891, and 1891 and 1920 (see Section 2.4.3). The canal segment within the APE retains the same alignment as it did in 1920. The width of the segment in the APE appears to be the same today as it was in 1942. As such, ASM recommends that this segment of the canal is assumed eligible under Criterion A/1 with a period of significance of 1920-1974 as part of the FID system and is assumed not eligible for the period of significance of 1874-1919. The canal is not specifically associated with one individual as it was constructed and improved as part of an irrigation collective that changed over time. Therefore, ASM recommends that this segment is not eligible under Criterion B/2. ASM recommends that this segment be assumed eligible under Criterion C/3 as part of the FID system 1920-1974 and is assumed not eligible for the period of significance of 1874-1919. This segment of the Houghton Canal does not have the potential to provide information about history or prehistory that is not available through historic research. ASM recommends this segment of the Houghton Canal is not eligible under

Criterion D/4.

In conclusion, ASM recommends that this segment of the Houghton Canal be assumed eligible under Criterion A/1 and Criterion C/3 as part of the FID system with the period of significance of 1920-1974 and is assumed not eligible for the period of significance of 1874-1919 due to alignment changes .

Central No. 23 (P-10-004677)

The segment of the canal within the APE would be potentially assumed eligible under Criterion A/1 for the period of significance of 1874-1919 for early irrigation infrastructure for agricultural development on the east side of the San Joaquin Valley and as part of the FID system 1920-1974. The canal is not specifically associated with one individual as it was constructed as part of an irrigation collective. Therefore, ASM recommends this segment of the canal is not eligible under Criterion B/2. This segment of the canal would be potentially assumed eligible under Criterion C/3 for the period of significance of 1874-1919 for early irrigation development for agricultural production on the east side of the San Joaquin River and as part of the FID system 1920-1974. This segment of the canal does not have the potential to provide information about history or prehistory that is not available through historic research. ASM recommends this segment of the canal is not eligible under Criterion D/4.

Integrity

For conveyance features, an integrity assessment is dependent on the retention of the alignment within the period of significance. The segment of the canal within the APE was constructed between 1891 and 1921. However, the segment alignment slightly shifted in the southern end of the APE between 1921 and 1937, and thereafter remained the same alignment. As such, ASM recommends that this segment of the canal is assumed eligible under Criterion A/1 with a period of significance of 1920-1974 as part of the FID system and is assumed not eligible for the period of significance of 1874-1919. The canal is not specifically associated with one individual as it was constructed and improved as part of an irrigation collective that changed over time. Therefore, ASM recommends that this segment is not eligible under Criterion B/2. ASM recommends that this segment be assumed eligible under Criterion C/3 as part of the FID system 1920-1974 and is assumed not eligible for the period of significance of 1874-1919. This segment of the Houghton Canal does not have the potential to provide information about history or prehistory that is not available through historic research. ASM recommends this segment of the Central No. 23 Canal is not eligible under Criterion D/4.

In conclusion, ASM recommends that this segment of the Central No. 23 Canal be assumed eligible under Criterion A/1 and Criterion C/3 as part of the FID system with the period of significance of 1920-1974 and is assumed not eligible for the period of significance of 1874-1919 due to alignment changes.

Hansen Ditch (P-10-004724)

The segment of the canal within the APE would be potentially assumed eligible under Criterion

A/1 for the period of significance of 1874-1919 for early irrigation infrastructure for agricultural development on the east side of the San Joaquin Valley and as part of the FID system 1920-1974. The canal is not specifically associated with one individual as it was constructed as part of an irrigation collective. Therefore, ASM recommends this segment of the canal is not eligible under Criterion B/2. This segment of the canal would be potentially assumed eligible under Criterion C/3 for the period of significance of 1874-1919 for early irrigation development for agricultural production on the east side of the San Joaquin River and as part of the FID system 1920-1974. This segment of the canal does not have the potential to provide information about history or prehistory that is not available through historic research. ASM recommends this segment of the canal is not eligible under Criterion D/4.

Integrity

For conveyance features, an integrity assessment is dependent on the retention of the alignment within the period of significance. The segment of the canal within Section 12, T14S, R21E was constructed between 1891 and 1921. However, the segment within the APE was realigned in the APE between 1937 and 1946, and thereafter remained the same alignment. As such, ASM recommends that this segment of the canal is assumed eligible under Criterion A/1 with a period of significance of 1920-1974 as part of the FID system and is assumed not eligible for the period of significance of 1874-1919. The canal is not specifically associated with one individual as it was constructed and improved as part of an irrigation collective that changed over time. Therefore, ASM recommends that this segment is not eligible under Criterion B/2. ASM recommends that this segment be assumed eligible under Criterion C/3 as part of the FID system 1920-1974 and is assumed not eligible for the period of significance of 1874-1919. This segment of the Houghton Canal does not have the potential to provide information about history or prehistory that is not available through historic research. ASM recommends this segment of the Central No. 23 Canal is not eligible under Criterion D/4.

In conclusion, ASM recommends that this segment of the Central No. 23 Canal be assumed eligible under Criterion A/1 and Criterion C/3 as part of the FID system with the period of significance of 1920-1974 and is assumed not eligible for the period of significance of 1874-1919 due to alignment changes.

5.2 RECOMMENDATIONS

Construction drawings for the project are not available as the Project is in the design phase, but the Project description in Section 1.1 confirms that the proposed Project will not alter the character-defining features of the Houghton Canal (P-10-007097), Central No. 23 (P-10-004677), and Hansen Ditch (P-10-004724), which are assumed eligible for the purposes of this undertaking under Criterion A/1 and Criterion C/3 as part of the FID system with the period of significance of 1920-1974 and is assumed not eligible for the period of significance of 1874-1919 due to alignment changes. Therefore, ASM recommends a determination of No Effect/No Significant Impact for the Recharge Basin Phase II Project. It is further recommended that an archaeologist be contacted if cultural resources are identified during the construction of the proposed Project.

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CONFIDENTIAL APPENDICES