Tulare Lake Storage and Floodwater Protection Project

Environmental Impact Report (EIR)

Volume I

PUBLIC DRAFT







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List of Abbreviations

% g	Peak ground acceleration
◦F	Fahrenheit
AADT	Average Annual Daily Traffic
AB	Assembly Bill
ac	acre
ABD	Abandoned
AF	acre-feet
AFY	acre-feet per year
AGR	Agriculture
AITS	Agricultural Industries Transportation Services
AML	Abandoned mine lands
AQMP	Air Quality Management Plan
Aqueduct	California Aqueduct
Aqueduct intertie	California Aqueduct conveyance facility
ASCE	American Society of Civil Engineers
Assembly Bill 939	California Integrated Waste Management Act of 1989
AST	aboveground storage tanks
Authority	California High Speed Rail Authority
BACT	Best Available Control Technology
Basin	Tulare Lake Basin
Basin Plan	Water Quality Control Plan for the Tulare Lake Basin
bbl	Billion barrels
BMP	Best Management Practice
BN&SF	Burlington Northern & Santa Fe
BO	Biological Opinion
C2VSim	California Central Valley Groundwater-Surface Water Simulation Model
CAA	California Clean Air Act
CAAQS	California Ambient Air Quality Standards
Cal/EPA	California Environmental Protection Agency
Cal/OSHA	California Occupational Safety and Health Administration
CalARP	California Accidental Release Program
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency
Caltrans	California Department of Transportation
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CBC	California Building Code
CCCC	California Climate Change Center
CCR	California Code of Regulations
CDF	California Department of Forestry

CDFA	California Department of Food and Agriculture
CDFW	California Department of Fish and Wildlife
CDOC	California Department of Conservation
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
cfs	Cubic feet per second
CGS	California Geologic Survey
CH_4	methane
CHP	California Highway Patrol
CHRIS	California Historical Resources Information System
CHSC	California Health and Safety Code
CIWMB	California Integrated Waste Management Board
CNDDB	California Natural Diversity Data Base
CNPS	California Native Plant Society
cm	centimeter
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
County	Kings County
CPUC	California Public Utilities Commission
CRHR	California Register of Historical Reo
CRPR	California Rare Plant Rank
CSD	Community Services District
CSUB	California State University, Bakersfield
CTC	California Transportation Commission
CUPA	Certified Unified Program Agency
CVFPB	Central Valley Flood Protection Board
CVP	California Valley Project
CVPIA	Central Valley Project Improvement Act
CVRWQCB	Central Valley Regional Water Quality Control Board
CWA	Clean Water Act
cy	cubic yards
dB	decibel
dBA	A-weighted decibel
Delta	Sacramento-San Joaquin River Delta
DOF	California Department of Finance
DOGGR	Division of Oil, Gas & Geothermal Resources
DEIR	Draft Environmental Impact Report
DSOD	California Division of Safety of Dams

DTSC	Department of Toxic Substances Control
DWR	Department of Water Resources
EA	Environmental Assessment
ECA	Essential Connectivity Area
EDR	Environmental Data Resources, Inc.
EHS	Environmental Health Services
EIR	Environmental Impact Report
EMS	Emergency Medical Services
Entitlement Exchange	Entitlement water exchanges
EO	Executive Order
EOC	Emergency Operation Center
EOP	Emergency Operations Plan
ERIP	Emission Reduction Incentive Program
ESA	Environmentally Sensitive Area
ETo	Evapotranspiration rate
FCAA	Federal Clean Air Act
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FID	Fresno Irrigation District
FMMP	Farmland Mapping and Monitoring Program
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
FSZ	Farmland Security Zone
ft	feet
FTA	Federal Transit Administration
FTIP	Federal Transportation Improvement Program
GHG	greenhouse gases
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
GWH	gigawatt-hours
GWMP	Groundwater Management Plan
GWP	global warming potential
GWR	Groundwater
HCP	Habitat Conservation Plan
HFCs	hydrofluorocarbons
HHWE	Household Hazardous Waste Elements
HMBP	Hazardous Materials Business Plan
HMMP	Habitat Mitigation and Monitoring Plan
HMMSCP	Hazardous Materials Management and Spill Control Plan
HMP	Hazard Mitigation Plan
HSC	Health and Safety Code
HV	High voltage

I-5	Interstate 5
ID	inside-diameter
IMP	Invasive Species Management Plan
in/sec	Inches per second
IPCC	Intergovernmental Panel on Climate Change
IRLP	Irrigated Lands Regulatory Program
IRWMP	Integrated Regional Water Management Plan
ITP	Incidental Take Permit
JID	James Irrigation District
KART	Kings Area Rural Transit
KCAG	Kings County Association of Governments
KCCDA	Kings County Community Development Agency
KCCP	Kettleman City Community Plan
KCEHS	Kings County Department of Environmental Health Services
KCFD	Kings County Fire Department
KCSD	Kings County Sherriff's Department
KCWA	Kerns County Water Agency
KCWRA or KWRA	Kings County Waste and Recycling Authority
KHF	Kettleman Hills Facility
KRCD	Kings River Conservation District
KRWA	Kings River Water Association
kV	kilovolt
kW	kilowatts
kWh/AF	kilowatt-hours per acre-foot
LA	Los Angeles
LACSD	Sanitation Districts of Los Angeles County
LAFCo	Local Agency Formation Commission
LEA	Local Enforcement Agency
LEV	Low Emission Vehicle
LOS	Level of Service
LPG	liquid propane gas
LSAT	Land-Surface Air Temperature
LTF	Local Task Force Local Transportation Fund
M	Mercalli Index
MCF	thousand cubic feet
MCL	Maximum Contaminant Level
mg/L	milligram per liter
µg/L	microgram per liter
MGD	million gallons per day
MLD	most likely descendant
MM	Mitigation Measure

MMI	Modified Mercalli Intensity Scale
MMT	million metric tons or gigatonne
MND	Mitigated negative declaration
mph	miles per hour
MPO	Metropolitan Planning Organizations
MRF	Materials Recovery Facility
MRMP	Mineral Resource Management Program
MRZ	Mineral resource zone
MSL	Mean sea level
MUN	municipal
MUTCD	Manual of Uniform Traffic Control Devices
MW	megawatts
MWh	megawatt-hours
N_2O	nitrous oxides
NAAQS	National Ambient Air Quality Standards
NAHC	Native America Heritage Commission
NAS	Naval Air Station Lemoore
NASL	Naval Air Station Lemoore
NEPA	National Environmental Policy Act
NEPDG	National Energy Policy Development Group
NFIP	National Flood Insurance Program
NFPA	National Fire Protection Association
NHD	National Hydrography Dataset
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO	nitric oxide
NO_2	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NOA	Notice of Availability
NOC	Notice of Completion
NOP	Notice of Preparation
NO_x	nitrogen oxides
NP	No-Project
NPDES	National Pollutant Discharge Elimination System
NPPA	Native Plant Protection Act
NPS	National Park Service
NRCS	National Resources Conservation Service
NRHP	National Register of Historic Places
NS	No standard exists
NTU	Nephelometric Turbidity Unit
NWR	National Wildlife Refuge
O&M	Operations and maintenance

O_3	ozone
OEM	Office of Emergency Management
OES	Office of Emergency Services
OSHA	Occupational Safety and Health Administration
PFCs	perfluorocarbons
PG&E	Pacific Gas and Electric Company
PIP	Pump-in-proposal
PM_{10} and $PM_{2.5}$	fine particulates
ppb	parts per billion
ppm	parts per million
PPV	Peak particle velocity
PQS	Professional Qualification Standards
PRC	California Public Resources Code
Project	Tulare Lake Storage and Floodwater Protection Project
PSD	Prevention of Significant Deterioration
QTc	Miocene to Holocene continental rocks and deposits
QTl	Pliocene to Holocene lacustrine and marsh deposits
RC	Resource Conservation
RCRA	Resource Conservation and Recovery Act
RD	Reclamation District
RDM	Residual Dry Matter
REC-1	water contact recreation
REC-2	non-contact water recreation
Region	Poso Creek Region
Relocation Plan	Special Status Small Mammal Mortality Reduction and Relocation Plan
Resources Agency	California Resources Agency
RGA LF	Recovered Government Archive Landfill
RHNA	Regional Housing Needs Allocation Plan
RMP	Risk Management Plan
ROG	Reactive organic gases
ROW	Right-of-way
RPS	California Renewables Portfolio Standard
RTIP	Regional Transportation Improvement Program
RTP	Regional Transportation Plan
RTPA	Regional Transportation Planning Agency
RWMG	Poso Creek Regional Water Management Group
S or µmho	microsiemens
SAA	Streambed Alteration Agreement
SARA	Superfund Amendments and Reauthorization Act
SB	Senate Bill
SCS	Soil Conservation Soil Sustainable Communities Strategy

SDC	Seismic Design Category
SEIR	Supplemental Environmental Impact Report
Semitropic	Semitropic Improvement District of the Semitropic Water Storage District
Semitropic Groundwater Bank	Semitropic Groundwater Banking Program
SF_6	sulfur hexafluoride
SGMA	Sustainable Groundwater Management Act
SHPO	State Historic Preservation Office
SJV	San Joaquin Valley
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SJVB	San Joaquin Valley Blueprint
SJVRR	San Joaquin Valley Railroad
SLF	Sacred Lands File
SMARA	State Surface Mining and Reclamation Act
SMCL	Secondary Maximum Contaminant Level
SO_2	sulfur dioxide
SOI	Secretary of Interior
SOP	Standard Operating Procedures
South Fork Canal	Kings River-South Fork Canal
SRRE	Source Reduction and Recycling Elements
SSC	Species of Special Concern
SSJMUD	Southern San Joaquin Municipal Utility District
SSJVIC	Southern San Joaquin Valley Information Center
STA	State Transit Assistance
STIP	State Transportation Improvement Program
STLC	Soluble threshold limit concentration
SVP	Society of Vertebrate Paleontology
SWAMP	Surface Water Ambient Monitoring Program
SWP	State Water Project
SWPAO	State Water Project Analysis Office
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
SWRU	Stored Water Recovery Unit
TCLP	Toxicity characteristic leaching procedure
TDS	total dissolved solids
TLBWSD	Tulare Lake Basin Water Storage District
TMDL	Total Maximum Daily Load
TMP	Traffic Management Plan
TNW	Traditional Navigable Water
TCR	Tribal cultural resources
Treatment Plant	Kettleman City Surface Water Treatment Plant and Commercial Water Storage Tanks

Tribe	Santa Rosa Rancheria Tachi Yokut Tribe
TSP	Tubular steel poles
UBC	Uniform Building Code
UCR	Uniform Crime Reporting Program
Unified Program	Unified Hazardous Waste and Hazardous Materials Management Regulatory Program
USACE	U.S. Army Corps of Engineers
USBR	U.S. Bureau of Reclamation
USC	United States Code
USDA	United States Department of Agriculture
USDOE	U.S. Department of Energy
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UST	Underground storage tank
V	Valley Zone
VERA	Voluntary Emission Reduction Agreement
WAPA	Western Area Power Administration
WARM	warm freshwater habitat
WDR	Waste Discharge Requirement
WEAP	Worker Environmental Awareness Program
WEF	Water Education Foundation
WID	Wildlife Improvement District
WILD	wildlife habitat
WMO	World Meteorological Organization
WWTF	Wastewater Treatment Facility
ZEV	Zero Emissions Vehicle

Executive Summary

ES-1.1 Introduction

The Semitropic Improvement District of the Semitropic Water Storage District (Semitropic), as the California Environmental Quality Act (CEQA) lead agency, has prepared this Draft Environmental Impact Report (Draft EIR) for the Tulare Lake Storage and Floodwater Protection Project (Project). This Draft EIR was developed to provide the public and responsible and trustee agencies reviewing the Project with an analysis of the potential effects on the local and regional environment associated with construction and operation & maintenance of the proposed Project.

This Draft EIR has been prepared in compliance with CEQA (California Public Resources Code, Section 21000 *et seq.*), CEQA Guidelines (CCR Title 14 Section 15000 *et seq.*), and the policies and procedures of Kings County. Inquiries about the proposed Project should be directed to:

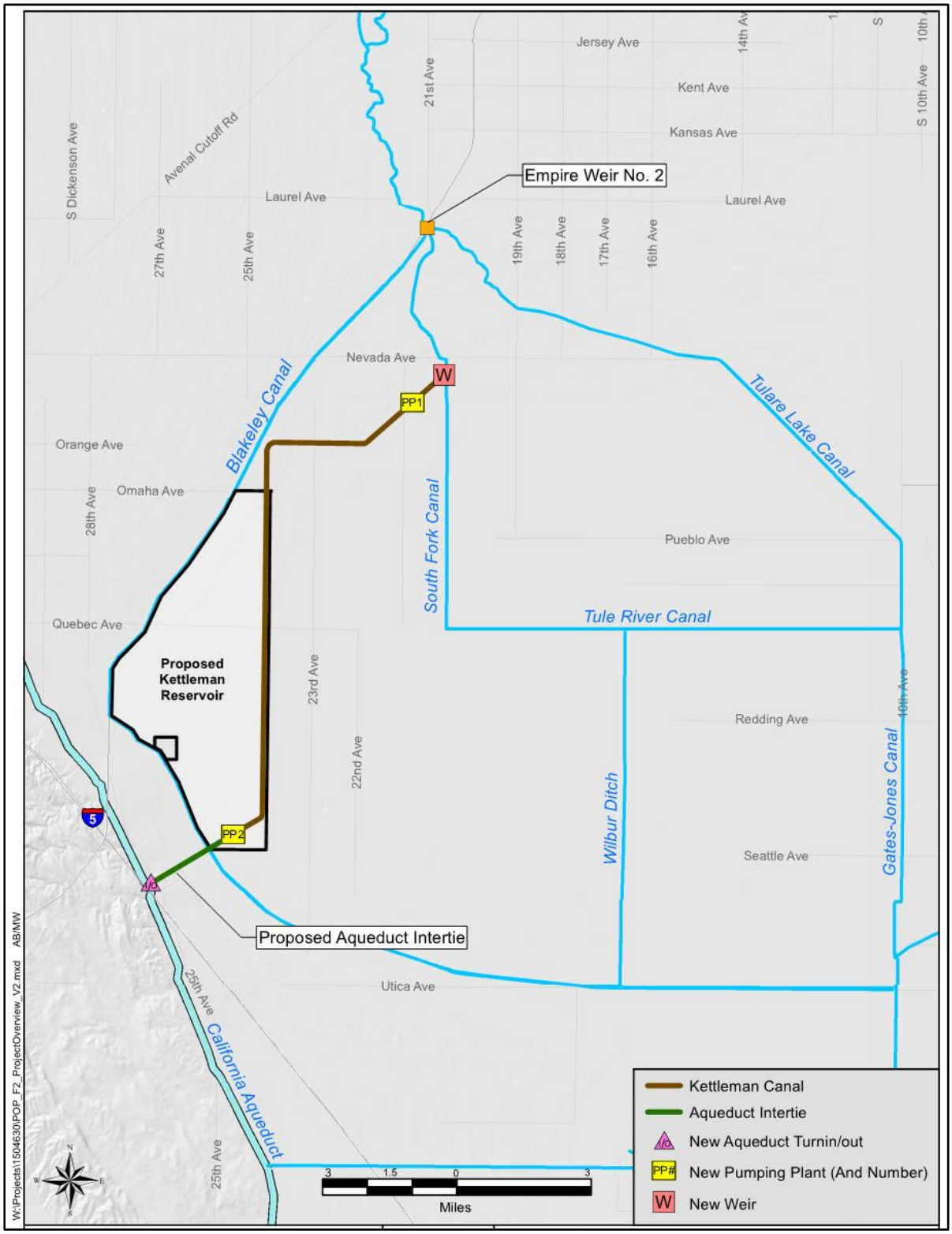
Semitropic Water Storage District
Attn: Isela Medina, Staff Engineer
P.O. Box 8043
1101 Central Avenue
Wasco, CA, 93280-0877
(661) 758-5113

The primary purpose of the Project is to construct and operate facilities which would capture and temporarily store floodwaters from the Kings River and possibly other supplies from tributaries to the Tulare Lake bed for beneficial uses. The Project facilities could also be used for possible management of surplus State Water Project (SWP) flows south of the Delta. The proposed Project would include diversion, surface storage, conveyance, and other facilities situated within unincorporated Kings County, near Kettleman City, as shown in **Figure ES- 1**. The Project would alleviate local flooding of nearby agricultural lands and disadvantaged communities. Available waters would be conveyed to and through the proposed Project storage reservoir to the California Aqueduct through a combination of new and existing channels and canals, with the stored waters ultimately conveyed to places of use in Kern County or Kings County to help meet existing irrigation demands or for storage principally in available capacity of existing groundwater banking programs.

ES-1.2 Background

Semitropic is located in north-central Kern County in the San Joaquin Valley, about 20 miles northwest of the City of Bakersfield. Semitropic currently covers an area of more than 221,000 acres with about 138,000 acres of irrigated land. Semitropic is one of eight water storage districts in California; it was organized in 1958 in response to a long-term decline in groundwater levels to provide supplemental water for irrigation within Kern County and Kings County. Semitropic's water sources are primarily used within the boundaries of Semitropic for a wide-variety of agricultural crop purposes. Pumped groundwater and/or surface water supplies are conveyed to lands within Semitropic Improvement District (which includes the Buttonwillow Improvement District and Pond-Poso Improvement District), SWP contract water service areas, and Semitropic Banking Project in-lieu water service areas. Currently, Semitropic's primary source of water is 155,000 acre-feet per year (AFY) of imported SWP water which is conjunctively managed with underlying groundwater from a groundwater basin that is considered to be critically overdrafted.

Figure ES- 1: Proposed Project Facilities



Since the mid-1990s, Semitropic's SWP water allocations have been significantly reduced due to regulatory requirements associated with conveying water through Delta and other factors. According to DWR's *Draft State Water Project Delivery Capability Report* (2015), the SWP is projected to yield only 62 percent of contracted amounts (a reduction of 38 percent), on average, under existing conditions. Accordingly, a reduction of 38 percent in Semitropic's SWP allocation equates to almost 59,000 acre-feet less water available in an average year (under current conditions). From time to time – mostly during "wet" years – other, less reliable supplies have been delivered to Semitropic, including surface water from Poso Creek, the Kern River and Friant-Kern water. Since future SWP contract water deliveries to Semitropic are uncertain, Semitropic is seeking a reliable alternative water supply.

The proposed Project would capture floodwater from the South Fork of the Kings River and possibly other Tulare Lake tributaries, and deliver or store captured surface water to Semitropic and possibly other places of use in Kern County and Kings County. Water made available by the Project may be stored in the Semitropic Groundwater Bank or stored in other groundwater banks and storage facilities outside Semitropic that are accessible by the Aqueduct and/or other water conveyance facilities accessible by Semitropic. Waters captured and stored (banked) by the proposed Project would be pumped by District landowners or transferred by direct delivery or exchange for use in Semitropic and possibly in other portions of Kern County and Kings County to supplement supplies for use on existing irrigated lands. This supply of floodwaters from the Kings River and other waters managed by the Project would contribute to a long-term, reliable water supply for Semitropic and its farmers and would augment Semitropic's SWP supply.

In addition to provision of water to the Semitropic service area, the Project would expand groundwater conjunctive use opportunities by capturing and temporarily storing floodwaters and other available waters in storage facilities to take advantage of unused groundwater banking capacities in Kings and Kern Counties, thereby allowing for greater water supply benefits at the local, regional and State levels. In addition, the Project would benefit local agricultural lands and disadvantaged communities impacted by subsidence by providing additional flood security through the controlled diversion of floodwaters from local rivers to storage. Furthermore, the Project would support waterfowl and migratory bird populations by intermittently providing water-based habitat in the former freshwater Tulare Lake.

ES-1.3 Purpose and Need

As noted previously, Semitropic has been experiencing an increased reduction in SWP water allocations as compared to historical amounts, resulting in a less reliable long-term supply. As a result, Semitropic needs to develop alternative agricultural water supplies to offset this reduction. The Tulare Lake Storage and Floodwater Protection Project was conceived in response to the reduced water supply reliability, the Sustainable Groundwater Management Act of 2014 (SGMA), and declining groundwater levels, with the primary purpose of the project to capture floodwaters and store these flows in the Semitropic Groundwater Bank and other local groundwater banking programs for later use in Kern County and Kings County to supplement water supplies for existing irrigated lands.

ES-1.4 CEQA Objectives

The overall objective of the proposed Project is to capture floodwaters to maximize beneficial use of sustainable, alternative water supplies within the region which would address reductions in water supplies from the SWP and reduce the reliance on groundwater use. Specifically, the objectives of the Project are as follows:

- Establish an alternative, reliable, long-term water supply and reduce groundwater pumping by diverting, banking and subsequently using a portion of the floodwaters from the South Fork of the Kings River;
- Provide potential operational flexibility at the State level to meet near- and long-term water supply, storage and Delta ecosystem needs;
- Provide regional flood reduction benefits in the Tulare Lake basin; and
- Enhance wildlife habitat and recreational opportunities in the historic Tulare Lake lakebed and elsewhere.

ES-1.5 Summary of Alternatives

This EIR evaluates three Project alternatives in comparison to a No Project Alternative, including the proposed Project, the 2,100 cubic feet per second (cfs) Project Alternative. Identification of the No Project Alternative and the other alternatives for this EIR was informed by the purpose and need of the Project, as presented in *Section 1.1.2, Purpose and Authority*; comments received during the scoping process; and an Alternatives Analysis prepared for the Project (GEI, 2017). Alternatives evaluated in the Alternatives Analysis but rejected from further consideration are discussed in *Chapter 5 Alternatives*. Alternatives considered in this EIR include:

No Project Alternative – this alternative assumes that the proposed Project would not be constructed and that floodwaters would not be supplied to Semitropic.

Proposed Project: 2,100 cfs Project Alternative – this is the proposed Project, and assumes diversion of 2,200 cfs of Kings River floodwaters at Empire Weir No. 2 into the South Fork Canal and Blakeley Canal, conveyance of 100 cfs via the Blakeley Canal into storage in the Kettleman Reservoir (constructed of earthen levees up to 8 feet in height), conveyance of 2,100 cfs of water via the South Fork Canal and proposed Kettleman Canal to the California Aqueduct, an Aqueduct Intertie facility and ancillary project facilities, including an electrical switchyard and substation and a maintenance yard.

Alternative 1: 1,200 cfs Project Alternative - this alternative includes all common Project features as the proposed Project (the 2,100 cfs Project Alternative), but limits levee heights for the storage cells within the Kettleman Reservoir to six feet to avoid jurisdiction by the California Division of Safety of Dams (DSOD), thereby allowing the Project to avoid added costs associated with DSOD regulations and the review processes.

Alternative 2: No Storage Alternative – this alternative would utilize the same conveyance facilities as the proposed Project (the 2,100 cfs Project Alternative) but would not include the construction of storage facilities, namely the proposed Kettleman Reservoir.

ES-1.6 Summary of Impacts

Table ES- 1 provides a summary of potential impacts by topic area. The table does not include impacts or criteria that were deemed not applicable to actions associated with the Project. All direct impacts of the proposed Project's construction and operation & maintenance can be mitigated to less than significant, save potential impacts to tribal and/or archaeological should they be uncovered during construction.

Table ES- 1: Proposed Project EIR Impact Summary

Impact Statement	Before Mitigation				Mitigation Measure	After Mitigation			
	No Project	Proposed Project: 2,100 cfs Project	Alt. 1 – 1,200 cfs Project	Alt. 2 – No Storage Project		No Project	Proposed Project: 2,100 cfs Project	Alt. 1 – 1,200 cfs Project	Alt. 2 – No Storage Project
Aesthetics									
AES-1: Damage scenic resources, including trees, rock outcroppings, and historic buildings within a scenic highway	NI	LTS	LTS	LTS	No mitigation measures necessary	NI	LTS	LTS	LTS
AES-2: Substantially degrade existing visual character or quality of site surroundings or have a substantial adverse effect on a scenic vista	NI	PS	PS	LTS	Mitigation Measure AES-1: Maintenance of Construction Worksite Mitigation Measure AES-2: Design of Facilities to Be Aesthetically Consistent with Existing Visual Character	NI	LSM	LSM	LTS
AES-3: Create a new source of substantial light or glare	NI	PS	PS	PS	Mitigation Measure AES-3: Nighttime Construction Lighting Mitigation Measure AES-4: Directional Security Lighting	NI	LSM	LSM	LSM
Agriculture and Forestry Resources									
AG-1: Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use	NI	PS	PS	PS	Mitigation Measure AG-1: Manage Topsoil for Conservation	NI	LSM	LSM	LSM
AG-2: Conflict with existing zoning for agricultural use or a Williamson Act contract	NI	LTS	LTS	LTS	No mitigation measures necessary	NI	LTS	LTS	LTS
AG-3: Other changes to existing environment that would convert farmland to non-agricultural use or forest land to non-forest use	NI	LTS	LTS	LTS	No mitigation measures necessary	NI	LTS	LTS	LTS
Air Quality									
AIR-1: Violate an air quality standard or contribute to an existing air quality violation or Increase criteria pollutants	NI	PS	PS	PS	Mitigation Measure AIR-1: Dust Control Plan Mitigation Measures AIR-2: Idling Restrictions Mitigation Measure AIR-3: Voluntary Emission Reduction Agreement (VERA)	NI	LSM	LSM	LSM
AIR-2: Expose sensitive receptors to a substantial pollutant concentration	NI	LTS	LTS	LTS	No mitigation measures necessary	NI	LTS	LTS	LTS
AIR-3: Create odors affecting numerous people	NI	LTS	LTS	LTS	No mitigation measures necessary	NI	LTS	LTS	LTS
AIR-4: Conflict with applicable air quality plan	NI	LTS	LTS	LTS	No mitigation measures necessary	NI	LTS	LTS	LTS

Notes: NI= No Impact, LTS=Less than Significant, PS=Potentially Significant, LSM=Less than Significant with Mitigation, S&U=Significant and Unavoidable

Impact Statement	Before Mitigation: No Project	Before Mitigation: Proposed Project: 2,100 cfs Project	Before Mitigation: Alt. 1 – 1,200 cfs Project	Before Mitigation: Alt. 2 – No Storage Project	Mitigation Measure	After Mitigation: No Project	After Mitigation: Proposed Project: 2,100 cfs Project	After Mitigation: Alt. 1 – 1,200 cfs Project	After Mitigation: Alt. 2 – No Storage Project
Biological Resources									
BIO-1: Substantial adverse effect on a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations	NI	PS	PS	PS	Mitigation Measure BIO-1: Nested Compensatory Mitigation Mitigation Measure BIO-2: Habitat Mitigation and Monitoring Plan Mitigation Measure BIO-3: Preconstruction Special Status Rare Plant Surveys Mitigation Measure BIO-4: Special Status Plant Species Avoidance and Minimization Mitigation Measure BIO-5: Compensatory Mitigation for Special Status Plant Species Mitigation Measure BIO-6: Invasive Species Management Plan Mitigation Measure BIO-7: Preconstruction Surveys for San Joaquin Kit Fox Mitigation Measure BIO-8: San Joaquin Kit Fox Den Avoidance and Minimization Measures – Construction Phase Mitigation Measure BIO-9: Listed Kangaroo Rat Transect Surveys, Trapping, and Relocation Mitigation Measure BIO-10: Nelson's Antelope Squirrel Pre-Construction Surveys Mitigation Measure BIO-11 - Blunt-nosed Leopard Lizard Protocol Surveys Mitigation Measure BIO-12: Preconstruction Surveys for Burrowing Owl Mitigation Measure BIO-13: Burrowing Owl Avoidance and Minimization Measures Mitigation Measure BIO-14 - Compensatory Habitat Mitigation for Burrowing Owl Mitigation Measure BIO-15 – American Badger Avoidance and Minimization Measures Mitigation Measure BIO-16: Western Spadefoot, Northern Western Pond Turtle, San Joaquin coachwhip and Tulare Grasshopper Mouse Pre-Construction Survey Mitigation Measure BIO-17 - Species of Special Concern Avoidance and Minimization Mitigation Measure BIO-18: Preconstruction Surveys for Raptors and Other Special Status Bird Species. Mitigation Measure BIO-19: Avian Botulism Impact Avoidance and Minimization Mitigation Measure BIO-20: Special Status Bird Species Impact Avoidance and Minimization Mitigation Measure BIO-21: Special Status Animal Species General Avoidance Measures and Best Management Practices Mitigation Measure BIO-22: Worker Environmental Awareness Program	NI	LSM	LSM	LSM

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Impact Statement	Before Mitigation				Mitigation Measure	After Mitigation			
	No Project	Proposed Project: 2,100 cfs Project	Alt. 1 – 1,200 cfs Project	Alt. 2 – No Storage Project		No Project	Proposed Project: 2,100 cfs Project	Alt. 1 – 1,200 cfs Project	Alt. 2 – No Storage Project
BIO-2: Adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations	NI	PS	PS	PS	Mitigation Measure BIO-23: Work Area Delineation Mitigation Measure BIO-24: Riparian and Aquatic Resource Mitigation	NI	LSM	LSM	LSM
BIO-3: Adverse impact on federally protected wetlands	NI	PS	PS	PS	Mitigation Measure BIO-25: Wetland Avoidance and Minimization Mitigation Measure BIO-26: Wetland Habitat Mitigation	NI	LSM	LSM	LSM
BIO-4: Interfere substantially with the movement of fish or wildlife species, or impede use of native wildlife nursery sites	NI	PS	PS	PS	Mitigation Measure BIO-27: Rookery Preconstruction Survey and Avoidance	NI	LSM	LSM	LSM
BIO-5: Conflict with local policies or ordinances protecting biological resources	NI	LTS	LTS	LTS	No mitigation measures necessary	NI	LTS	LTS	LTS
Cultural Resources									
CR-1: Impact historical and unique archaeological resources	NI	PS	PS	PS	Mitigation Measure CUL-1: Conduct Cultural Resources Investigation of The Project Site Mitigation Measure CR-2: Avoid Archaeological Sites within the Project Site Mitigation Measure CR-3: Conduct Phase II Cultural Resources Evaluation(s) Mitigation Measure CR-4: Conduct Phase III Cultural Resources Data Recovery Mitigation Measure CR-5: Archaeological Sensitivity Training Mitigation Measure CR-6: Archaeological and Native American Monitoring Mitigation Measure CR-7: Unanticipated Discovery of Cultural Resources Mitigation Measure CR-8: Site Security Measures	NI	LSM	LSM	LSM
CR-2: Impact historical resources	NI	PS	PS	PS	Mitigation Measure CUL-9: Evaluation of P-16-000266 (California Aqueduct Main Canal) Mitigation Measure CR-10: Treatment of P-16-000266 (California Aqueduct Main Canal) Mitigation Measure CR-11: Evaluation of Historical Resources Mitigation Measure CR-12: Treatment of Historical Resources	NI	LSM	LSM	LSM
CR-3: Significant impact on paleontological resources	NI	PS	PS	LSM	Mitigation Measure CR-13: Retain a Qualified Paleontologist Mitigation Measure CR-14: Paleontological Mitigation and Monitoring Program Mitigation Measure CR-15: Paleontological WEAP Mitigation Measure CR-16: Paleontological Monitoring Mitigation Measure CR-17: Salvage of Fossils Mitigation Measure CR-18: Preparation and Curation of Recovered Fossils Mitigation Measure CR-19: Final Paleontological Mitigation Report	NI	LSM	LSM	LSM

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Impact Statement	Before Mitigation				Mitigation Measure	After Mitigation			
	No Project	Proposed Project: 2,100 cfs Project	Alt. 1 – 1,200 cfs Project	Alt. 2 – No Storage Project		No Project	Proposed Project: 2,100 cfs Project	Alt. 1 – 1,200 cfs Project	Alt. 2 – No Storage Project
CR-4: Impact human remains	NI	PS	PS	PS	Mitigation Measure CR-20: Burial Protection and Treatment Plan Mitigation Measure CR-21: Treatment of P-16-000143 Human Remains Mitigation Measure CR-22: Unidentified Human Remains	NI	LSM	LSM	LSM
CR-5 Impact tribal cultural resources	NI	PS	PS	PS	Mitigation Measure CR-23: Consult with California Native Americans	NI	LSM	LSM	LSM
Geology and Soils									
GEO-1: Expose people or structures to substantial adverse effects from strong seismic groundshaking	NI	PS	PS	PS	Mitigation Measure GEO-1: Implement Recommendations Outlined in Design-Level Geotechnical Evaluations for Seismic Hazards	NI	LSM	LSM	LSM
GEO-2: Risk to property and life from expansive soils	NI	PS	PS	PS	Mitigation Measure GEO-2: Implement Recommendations Outlined in Design-Level Geotechnical Evaluations for Expansive Soils	NI	LSM	LSM	LSM
GEO-3: Facility damage and exposure of people to hazards from liquefaction and lateral spreading	NI	PS	PS	PS	Mitigation Measure GEO-3: Implement Recommendations Outlined in Design-Level Geotechnical Evaluations for Liquefaction and Other Geologic Hazards	NI	LSM	LSM	LSM
GEO-4: Result in substantial soil erosion or loss of topsoil	NI	LTS	LTS	LTS	No mitigation measures necessary	NI	LTS	LTS	LTS
GEO-5: Salinization of Soils	NI	PS	PS	LTS	Mitigation Measure GEO-4: Manage Soil Salinity	NI	LSM	LSM	LTS
Greenhouse Gas Emissions									
GHG-1: Generate greenhouse gas emissions	NI	LTS	LTS	LTS	No mitigation measures necessary	NI	LTS	LTS	LTS
GHG-2: Conflict with an applicable plan aimed to reduce greenhouse gas emissions	NI	LTS	LTS	LTS	No mitigation measures necessary	NI	LTS	LTS	LTS
Hazards and Hazardous Materials									
HAZ-1: Transport, use, or dispose of hazardous materials	NI	PS	PS	PS	Mitigation Measure HAZ-1: Hazardous Materials Management and Spill Control Plan Mitigation Measure HAZ-2: Preparation of Hazardous Materials Business Plan	NI	LSM	LSM	LSM
HAZ-2: Disturbance of onsite hazardous materials that could potentially create a safety hazard to the public or environment	NI	PS	PS	PS	Mitigation Measure HAZ-3: Soil Sampling and Disposal Mitigation Measure HAZ-4: Contaminated Soil Contingency Plan Mitigation Measure HAZ-5: Onsite Monitoring	NI	LSM	LSM	LSM
HAZ-3: Located on a listed hazardous material site (pursuant to Government Code Section 65962.5)	LTS	LTS	LTS	LTS	No mitigation measures necessary	LTS	LTS	LTS	LTS
HAZ-4: Create a safety hazard for people working near the vicinity of a private airstrip	NI	LTS	LTS	LTS	No mitigation measures necessary	NI	LTS	LTS	LTS
HAZ-5: Impair or interfere with an adopted emergency evacuation and response plan	NI	PS	PS	PS	Mitigation Measure TRA-1: Implement a Construction Management Plan to Minimize Interference with Traffic and Emergency Response Hazards	NI	LSM	LSM	LSM
HAZ-6: Expose people or structures to wildfire risks	NI	PS	PS	PS	Mitigation Measure HAZ-6: Prevention of Fire Hazards	NI	LSM	LSM	LSM

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Impact Statement	Before Mitigation				Mitigation Measure	After Mitigation			
	No Project	Proposed Project: 2,100 cfs Project	Alt. 1 – 1,200 cfs Project	Alt. 2 – No Storage Project		No Project	Proposed Project: 2,100 cfs Project	Alt. 1 – 1,200 cfs Project	Alt. 2 – No Storage Project
HAZ-7: Create a new or increased human health hazards associated with vector-borne diseases.	NI	PS	PS	PS	Mitigation Measure HAZ-7: Develop and Implement a Mosquito, Vector, and Other Nuisance Problem Control Plan	NI	LSM	LSM	LSM
Hydrology and Water Quality									
HYD-1: Exceed any water quality standards or waste discharge requirements	NI	PS	PS	PS	Mitigation Measure HYD-1: Storm Water Pollution Prevention Plan Mitigation Measure HYD-2: Prepare and Implement a Comprehensive Water Quality Monitoring Plan	NI	LSM	LSM	LSM
HYD-2: Substantially deplete groundwater supplies or interfere with groundwater recharge	NI	LTS	LTS	LTS	No mitigation measures necessary	NI	LTS	LTS	LTS
HYD-3: Alter existing drainage pattern resulting in substantial erosion or siltation	NI	PS	PS	PS	Mitigation Measure HYD-1: Storm Water Pollution Prevention Plan	NI	LSM	LSM	LSM
HYD-4: Alter existing drainage pattern resulting in increased surface runoff (resulting in flooding) and/or expose people or structures to risks from flooding (including flooding as a result of dam/levee failure)	NI	LTS	LTS	LTS	No mitigation measures necessary	NI	LTS	LTS	LTS
HYD-5: Alter flows in stream or river resulting in significant changes to flow patterns downstream and/or in the Delta	NI	LTS	LTS	LTS	No mitigation measures necessary	NI	LTS	LTS	LTS
HYD-6: Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff or otherwise degrade water quality	NI	PS	PS	PS	Mitigation Measure HYD-1: Storm Water Pollution Prevention Plan	NI	LSM	LSM	LSM
HYD-7: Place structures within a 100-year flood hazard area that would impede or redirect flood flows	NI	LTS	LTS	LTS	No mitigation measures necessary	NI	LTS	LTS	LTS
Land Use and Planning									
LUR-1: Conflict with an applicable land use plan, policy or regulation	NI	LTS	LTS	LTS	No mitigation measures necessary	NI	LTS	LTS	LTS
LUR-2: Conflict with a HCP and NCCP	NI	LTS	LTS	LTS	No mitigation measures necessary	NI	LTS	LTS	LTS
Noise									
NOI-1: Temporary, construction-related noise increases in excess of noise ordinance	NI	PS	PS	PS	Mitigation Measure NOI-1: Implement Noise Controls	NI	LSM	LSM	LSM
NOI-2: Temporary, construction-related vibration increases	NI	PS	PS	PS	Mitigation Measure NOI-2: Implement Vibration Controls	NI	LSM	LSM	LSM
NOI-3: Increases in ambient noise levels due to operational noise and vibration	NI	PS	PS	PS	Mitigation Measure NOI-3: Employ Noise Controls for Electrical Substation and Pump Stations	NI	LSM	LSM	LSM
NOI-4: Noise exposure from private airstrips	NI	PS	PS	PS	Mitigation Measure NOI-4: Employ Personal Protective Equipment	NI	LSM	LSM	LSM
Oil and Mineral Resources									
OIL-1: Result in loss of availability of a known mineral resource	NI	LTS	LTS	LTS	No mitigation measures necessary	NI	LTS	LTS	LTS
OIL-2: Result in loss of availability of mineral resource recovery site	NI	LTS	LTS	LTS	No mitigation measures necessary	NI	LTS	LTS	LTS
OIL-3: Substantially affect existing mineral resource recovery operations	NI	LTS	LTS	LTS	No mitigation measures necessary	NI	LTS	LTS	LTS
Population and Housing									
POP-1: Induce population growth	NI	LTS	LTS	LTS	No mitigation measures necessary	NI	LTS	LTS	LTS

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Impact Statement	Before Mitigation				Mitigation Measure	After Mitigation			
	No Project	Proposed Project: 2,100 cfs Project	Alt. 1 – 1,200 cfs Project	Alt. 2 – No Storage Project		No Project	Proposed Project: 2,100 cfs Project	Alt. 1 – 1,200 cfs Project	Alt. 2 – No Storage Project
Public Services									
PUB-1: Impact government facilities or increase the need for new or physically altered governmental facilities	NI	LTS	LTS	LTS	Mitigation Measure TRA-1: Implement a Construction Management Plan	NI	LSM	LSM	LSM
Recreation									
REC-1: Impair use of existing parks or other recreational facilities	NI	LTS	LTS	LTS	No mitigation measures necessary	NI	LTS	LTS	LTS
REC-2: Include recreational facilities or require expansion of existing recreational facilities	NI	LTS	LTS	LTS	No mitigation measures necessary	NI	LTS	LTS	LTS
Transportation/Traffic									
TRA-1: Increase in traffic and conflicts with traffic-related policies	NI	PS	PS	PS	Mitigation Measure TRA-1: Implement a Construction Management Plan to Minimize Interference with Traffic and Emergency Response Hazards	NI	LSM	LSM	LSM
TRA-2: Increase hazards due to a design feature	NI	LTS	LTS	LTS	No mitigation measures necessary	NI	LTS	LTS	LTS
TRA-3: Impacts to emergency access	NI	PS	PS	PS	Mitigation Measure TRA-1: Implement a Construction Management Plan to Minimize Interference with Traffic and Emergency Response Hazards	NI	LSM	LSM	LSM
TRA-4: Conflict with alternative transportation	NI	LTS	LTS	LTS	No mitigation measures necessary	NI	LTS	LTS	LTS
Utilities and Service Systems									
UTIL-1: Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board	NI	LTS	LTS	LTS	No mitigation measures necessary	NI	LTS	LTS	LTS
UTIL-2: Require construction of new or expansion of existing water or wastewater treatment facilities	NI	LTS	LTS	LTS	No mitigation measures necessary	NI	LTS	LTS	LTS
UTIL-3: Require construction of new storm water drainage facilities or expansion of existing facilities	NI	LTS	LTS	LTS	No mitigation measures necessary	NI	LTS	LTS	LTS
UTIL-4: Have insufficient water supplies available to serve the Project from existing entitlements and resources	NI	LTS	LTS	LTS	No mitigation measures necessary	NI	LTS	LTS	LTS
UTIL-5: Be served by a landfill with sufficient permitted capacity to accommodate the Project's solid waste disposal need	NI	LTS	LTS	LTS	No mitigation measures necessary	NI	LTS	LTS	LTS
UTIL-6: Comply with federal, state, and local statues and regulations related to solid waste	NI	LTS	LTS	LTS	No mitigation measures necessary	NI	LTS	LTS	LTS
UTIL-7: Result in disruption of utilities or services	NI	PS	PS	PS	Mitigation Measure UTL-1: Coordinate Relocation and Interruptions of Service with Utility and Service Providers During Construction	NI	LSM	LSM	LSM
UTIL-8: Result in a substantial increase in overall or per capita energy consumption or conflict with applicable energy efficiency policies or standards	NI	PS	PS	PS	Mitigation Measure UTL-2: Develop and Implement an Energy Efficiency Program	NI	LSM	LSM	LSM

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Chapter 1 Introduction and Project Background

1.1 Overview, Purpose, and Authority

The California Environmental Quality Act (CEQA) requires that all state and local government agencies consider the environmental consequences over which they have discretionary authority before taking an action that has the potential to affect the environment. This Draft Environmental Impact Report (EIR) was prepared by the Semitropic Improvement District of the Semitropic Water Storage District (Semitropic) in accordance with CEQA to evaluate the potential environmental impacts associated with the Tulare Lake Storage and Floodwater Protection Project (Project). This document was prepared in conformance with CEQA (California Public Resources Code, Section 21000 *et seq.*), CEQA Guidelines (CCR Title 14 Section 15000 *et seq.*), and the policies and procedures of Kings County. This EIR is intended to serve as an informational document for agency decision-makers and the public regarding the Project.

1.1.1 Overview

Semitropic is a California water storage district located near the City of Wasco, formed and existing pursuant to the California Water Storage District Law (Water Code section 39000 *et seq*). Semitropic is proposing to implement the Tulare Lake Storage and Flood Protection Project (proposed Project) in Kings County. The proposed Project would capture available wet-year flows (floodwaters) from the Kings River and possibly other Tulare Lake tributaries, as well as other available waters such as surplus SWP flows, and either directly or by exchange deliver or temporarily store captured water for later delivery to Semitropic and other places of use in Kern and King Counties. Available waters would be conveyed to and through the proposed Project storage reservoir constructed in the dry Tulare Lake bed through a combination of new and existing channels and canals. The proposed Project would also include a new conveyance facility to convey water in both directions between the proposed storage reservoir and the California Aqueduct (Aqueduct). Proposed diversion, surface storage, conveyance, and other facilities are situated within unincorporated Kings County, near Kettleman City. **Figure 1-1** shows the boundaries of the proposed Project site. **Figure 1-2** shows the proposed project facilities.

The proposed Project was developed in response to reduced water supply reliability, the Sustainable Groundwater Management Act (Water Code section 10720 *et seq.* [SGMA]), and declining groundwater levels. Restrictions on pumping from the Sacramento-San Joaquin River Delta (Delta) have reduced the reliability of SWP deliveries, and these reduced deliveries have led to increased groundwater extraction causing a decline in groundwater levels in the basin underlying Semitropic's boundaries or service area. SGMA, which was signed into law in September 2014 and became effective on January 1, 2015, requires the achievement of the sustainable management of groundwater resources (i.e., the sustainability goal) and the avoidance of undesirable results within California's groundwater basins (including chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply if continued over the planning and implementation horizon).

1.1.2 Purpose and Authority

Semitropic, as the Lead Agency, has prepared this Draft EIR to provide the public, trustee agencies, and other responsible agencies with information regarding the potential effects on the local and regional environments associated with the implementation of the proposed Project. This Draft EIR describes project-level elements of the Project and analyzes the potential environmental effects at the appropriate level of detail. The environmental impacts of the Project are analyzed to the appropriate degree of specificity, in accordance with Sections 15146 and 1516, and other applicable sections of CEQA (Public Res. Code § 21000 *et seq.*) and the CEQA Guidelines (Title 14 California Code of Regulations § 15000 *et seq.*)

Figure 1-1: Regional Setting

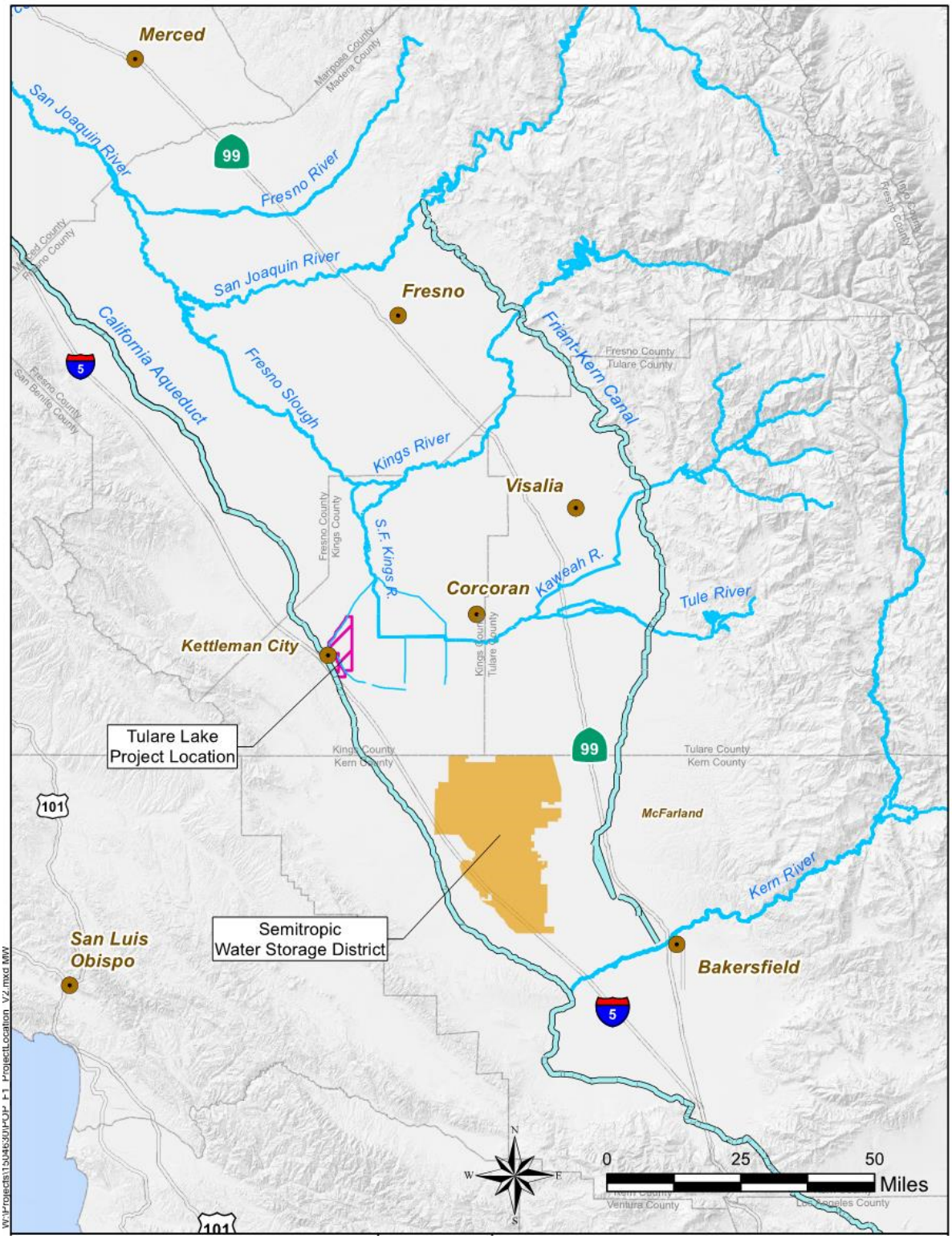
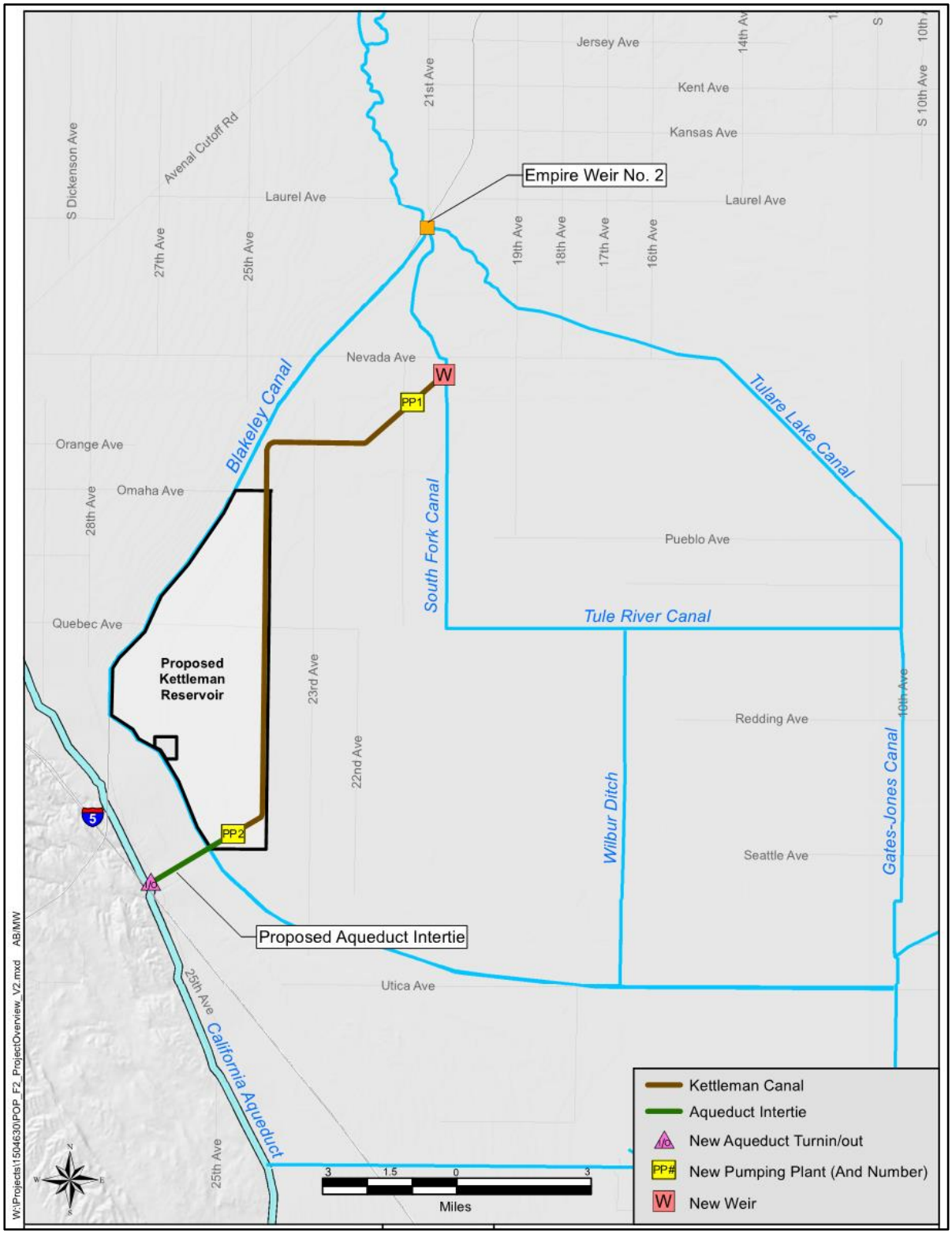


Figure 1-2: Proposed Project Facilities



This EIR may be used in the future to evaluate subsequent activities, including use of Project facilities for storage of supplies different from or in addition to those evaluated herein, consistent with applicable sections of CEQA and the CEQA Guidelines.

This document addresses the potentially significant adverse environmental impacts that may be associated with the planning, construction, operation, and maintenance of the individual components comprising the Project. It also identifies appropriate and feasible mitigation measures and alternatives that may be adopted to avoid significant impacts or reduce impacts to a less than significant level. The impact analyses are based on a variety of resources including, technical studies, agency consultations, and publicly-available documents.

1.1.3 Lead Agency Determination

Semitropic is designated as the lead agency for the purposes of this EIR. CEQA Guidelines Section 15367 defines the lead agency as "…the public agency, which has the principal responsibility for carrying out or approving a project." Other public agencies may use this Draft EIR in the decision-making or permitting processes and consider the information in this Draft EIR along with other information that may be presented during the CEQA process. The Semitropic Board of Directors, as the decision-making body for the Lead Agency, shall consider and certify this EIR prior to approving the proposed Project.

1.2 Objectives and Need for Project

The Tulare Lake Storage and Floodwater Protection Project would be located within Kings County, as shown in **Figure 1-1.** The primary purpose of the Project is to construct and operate facilities which would capture and temporarily store floodwaters from the Kings River and possibly other tributaries to the Tulare Lake bed for beneficial uses. The Project facilities could also be used for possible management of surplus State Water Project (SWP) flows south of the Delta, although the specific details of any particular potential surplus SWP water (beyond SWP supplies currently available for storage by Semitropic pursuant to existing agreements [e.g., KCWA member unit and Semitropic banking agreements]) and any other water supplies (except Kings River floodwaters) that may be regulated or managed by the Project are currently unknown. Specific details of all possible banking, transfers or exchanges of Project water and other potential actions associated with the Project are also unknown. Actions associated with other possible banking, transfers or exchanges beyond those described in this document would be subject any necessary additional CEQA analyses, as appropriate, once those possible actions are defined and proposed for implementation.

Water captured from the South Fork of the Kings River and temporarily stored by the Project would be managed by Semitropic to meet local water supply demands, mitigate groundwater declines, stabilize land subsidence, and improve sustainability of local groundwater resources. Water from the Aqueduct could also be diverted and stored to provide operational flexibility to flows in the Aqueduct.

The proposed Project would consist of the following overall components:

- Capture and management of floodwaters from the South Fork of the Kings River and possibly other tributaries to the Tulare Lake bed, and regulation of other available supplies, including surplus SWP supplies;
- Direct delivery to the California Aqueduct, or temporary storage of captured water for later delivery to the California Aqueduct, for conveyance to the Semitropic's service area and storage facilities, and/or other places of storage or use in Kern and Kings Counties;
- One surface storage reservoir (Kettleman Reservoir) with multiple interior impoundments, an interior conveyance channel and pumping plants to divert water to the reservoir, located within the boundaries of the dry lakebed of Tulare Lake;

- Pumping and other facilities required to transport water into and out of the proposed surface storage reservoir;
- Improvements to existing, local diversion and conveyance facilities from the South Fork of the Kings River to convey water to the conveyance infrastructure and/or surface storage impoundment;
- A new conveyance canal (Kettleman Canal) from the Kings River-South Fork Canal (South Fork Canal) to and through the proposed surface storage reservoir;
- A California Aqueduct conveyance facility (Aqueduct Intertie) and a turn-in/turn-out structure to deliver water into and from the Aqueduct;
- Electrical facilities to provide power to Project facilities (but constructed, owned and operated by Pacific Gas and Electric Company [PG&E]); and
- A maintenance yard to support Project operations.

1.2.1 Project Background and Need

Semitropic was organized in 1958 in response to a long-term decline in groundwater levels to provide supplemental water for irrigation within its service area. Prior to its formation, landowners within what would become Semitropic's service area relied exclusively on groundwater. Semitropic is located within California Department of Water Resources (DWR) Groundwater Basin No. 5-22.14 (San Joaquin Valley Groundwater Basin, Kern County Subbasin). Notwithstanding the imported water project efforts of Semitropic (described below) and other districts in Kern County, the groundwater basin is considered to be critically overdrafted.

Semitropic is one of approximately eight water storage districts in California and is located in north-central Kern County in the San Joaquin Valley, about 20 miles northwest of the City of Bakersfield (**Figure 1-1**), with Semitropic's office located in the City of Wasco. Semitropic currently covers an area of more than 221,000 acres (or 345 square miles), with about 138,000 acres of irrigated land. (Note, the irrigated area varies from year to year.)

Semitropic formulated, adopted, and implemented a project in the late 1960s and early 1970s to import surface water from the SWP, thereby reducing Semitropic's reliance on groundwater. Semitropic began importing water from the SWP in about 1973 under "Member Unit" contracts with the Kern County Water Agency (KCWA) for lands within its Buttonwillow Improvement District and the Pond-Poso Improvement Districts. (The Semitropic Improvement District carries out and manages, among other things, water projects of Semitropic, including those of the Buttonwillow and Pond-Poso Improvement Districts, which are governed by the same Board of Directors.) KCWA has a long-term SWP water supply contract with DWR for about 983,000 of SWP Table A water. (The maximum amount of SWP water that each contracting agency can received in a specific year is presented in a document published by DWR known as Table A.) Semitropic initially contracted for 158,000 acre-feet of SWP Table A water, but that amount was subsequently reduced to its current allocation of 155,000 acre-feet as a result of Semitropic permanently relinquishing 3,000 acre-feet to acquire an interest in the Kern Water Bank Authority (KWBA). Semitropic is a member entity of the KWBA, and as such, has rights to use the Kern Water Bank constructed by the KWBA for water storage and recovery including supplies deliverable to the KWBA lands via the California Aqueduct.

Semitropic's primary source of surface water is imported SWP water, which is conjunctively managed with the underlying groundwater. From time to time – mostly during "wet" years – other, less reliable supplies have been delivered to Semitropic, including surface water from Poso Creek, the Kern River and Friant-Kern water. Semitropic's water sources are primarily used within the boundaries of Semitropic for a wide-variety of agricultural crop purposes. Pumped groundwater and/or surface water supplies are conveyed to

lands within the Semitropic Improvement District (including the Pond-Poso Improvement District and Buttonwillow Improvement District), SWP contract water service areas (consisting of about 44,000 irrigated acres), and Semitropic Groundwater Bank in-lieu water service areas (consisting of about 39,000 irrigated acres, excluding the Stored Water Recovery Unit [SWRU] areas). Semitropic also provides another approximately 25,000 irrigated acres with temporary surface water service, and approximately 40,000 acres of irrigated acres with only groundwater (however, this area would reduce by the addition of the SWRU's in-lieu facilities, which would provide surface water service to up to approximately 13,000 of those 40,000 acres).

Year round, in addition to storing water in various groundwater banks as described below, Semitropic imports supplemental water (mostly SWP supplies) principally for irrigation uses within its boundaries. This water is used to irrigate about 135,000 to 145,000 acres (the total varying annually) through a system of canals, pipelines and associated facilities. Of this irrigated acreage, approximately 110,000 gross acres are served with surface water, and about 40,000 acres are totally reliant on groundwater (with plans to extend surface water connections to some of those lands). The amount of water needed to irrigate crops within Semitropic can be as much as approximately 350,000 to 400,000 acre-feet, annually. Semitropic's available supplies have recently ranged from 234,655 acre-feet (in 2011, a wet year) to 32,179 (2016, a critically dry year). Existing crops include almonds, pistachios, grapes, fruits and vegetables, nursery, cotton, alfalfa and grain/pasture.

Groundwater is also used within Semitropic's boundaries for purposes other than agricultural, including municipal, industrial and domestic purposes (e.g., City of Wasco, Wasco State Prison, and Lost Hills Public Utility District). With regard to environmental uses, in or about 1992, Semitropic established a Wildlife Improvement District (WID). The WID covers approximately 34,000 acres and includes most of the Kern National Wildlife Refuge and various local duck clubs, both of which are served with water by Semitropic for environmental purposes.

In the early-1990's, Semitropic developed the Semitropic Groundwater Bank to provide long-term underground storage of surplus water to its Banking Partners, and conversely to counteract declining groundwater levels associated in part with the increasing unreliability of SWP supplies due to regulatory requirements associated with conveying water through Delta and other factors. Water from SWP contracts that is surplus to the immediate needs of the Banking Partners is brought into Semitropic's service area via the California Aqueduct and stored within the Semitropic Groundwater Bank principally via surface deliveries to meet crop demands in lieu of groundwater pumping for later use. During dry years, stored water is recovered and conveyed to Semitropic facilities for distribution within its service area to replace Semitropic's entitlement or Table A water which is, in turn, released to its Banking Partners and/or stored water is recovered and conveyed directly to the California Aqueduct for delivery to its Banking Partners. The banking of supplemental surface waters in the aquifers underlying Semitropic's service area provides an effective way to reduce short-term groundwater level declines. Since its inception, the Semitropic Groundwater Bank has stored over 1.75 million AF of which 1.08 million AF has been recovered on behalf of the Banking Partners.

The Tulare Lake Storage and Floodwater Protection Project was developed in response to reduced water supply reliability, SGMA, and declining groundwater levels. The Project would address local and statewide critical water resource management issues described below.

- **Reduced State Water Project Reliability:** Restrictions on pumping from the Delta, particularly in recent years have significantly and adversely affected the reliability of SWP deliveries. According to DWR's *Draft State Water Project Delivery Capability Report* (2015), the SWP is projected to yield only 62-percent of contracted Table A amounts (a reduction of 38 percent), on average, under existing conditions. Semitropic's contract for SWP water would yield 155,000 acre-feet in a year with a 100-percent allocation. Accordingly, a reduction of 38 percent in Semitropic's

SWP allocation equates to almost 59,000 acre-feet less water available in an average year (under current conditions). Reduced SWP deliveries in recent years has led to increased groundwater extractions, causing a decline in groundwater levels in the basin underlying Semitropic's service area.

- **Sustainable Groundwater Management Act:** SGMA, which was signed into law in September 2014 and became effective on January 1, 2015, requires achievement of sustainable management of groundwater resources (i.e., the sustainability goal) and the avoidance of undesirable results within California's groundwater basins (including chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply if continued over the planning and implementation horizon). In the Central Valley portion of Kern County, a collaborative effort is underway to meet the requirements and objectives of SGMA, and Semitropic is actively engaged in this process as a member of the Kern Groundwater Authority and as the Semitropic Groundwater Sustainability Agency (GSA). For Semitropic and other neighboring districts in Kern County, SGMA could result in an overall reduction of groundwater availability within Semitropic's service area.

The proposed Project would capture floodwaters from the South Fork of the Kings River and possibly other Tulare Lake tributaries, as well as other available waters such as surplus SWP flows, and either directly or by exchange, deliver to or temporarily store captured surface water in Semitropic and other places of use and storage. Water made available by the Project may be stored in the Semitropic Groundwater Bank by various methods, including both directly via percolation and via in-lieu recharge (use of surface water in lieu of groundwater for irrigation). The Semitropic Groundwater Bank is an existing operational project located within Semitropic's boundaries in Kern County. Alternatively, the water could be stored in other groundwater banks and storage facilities outside Semitropic that are accessible by the Aqueduct and/or other water conveyance facilities accessible by Semitropic.

The Semitropic Groundwater Bank began operation in the early 1990's with an approved storage capacity of at least 1.65 million acre-feet. The Stored Water Recovery Unit, or SWRU, was developed by Semitropic beginning in 2000 to expand the recharge and recovery capacity of the Groundwater Bank. The SWRU has been evaluated under CEQA and approved by Semitropic to include increased banking capacity through the addition of up to 13,000 acres of in-lieu recharge facilities and an additional firm recovery capacity of up to 200,000 acre-feet per year (AFY) for the recovery of banked groundwater.

The proposed Project could use unallocated storage and recovery capacity in the Semitropic Groundwater Bank, including the SWRU in-lieu recharge facilities and capacity available in other facilities and programs as described below in Section 2.3.2. Waters captured and stored (banked) by the proposed Project would be pumped by District landowners or transferred by direct delivery or exchange for use in Semitropic and possibly in other portions of the Kern County and Kings County to supplement supplies for use on existing irrigated lands.

In summary, the proposed Project would:

- Put to beneficial use a portion of floodwaters from the South Fork of the Kings River and reduce groundwater pumping;
- Provide potential operational flexibility at the State level to meet near- and long-term water supply, storage and Delta ecosystem needs;
- Provide regional flood reduction benefits in the Tulare Lake basin; and
- Enhance wildlife habitat and recreational opportunities in the historic Tulare Lake lakebed and elsewhere.

1.2.2 Project Objectives

The proposed Project has the following key local and regional objectives:

- **Improved Local and Regional Water Supply Reliability:** The capture of available floodwaters from the Kings River system and nuisance floodwaters from the Tulare Lake bed would provide new local and regional water supplies and allow for augmentation and a reduction in the reliance upon declining groundwater resources. Combined with Semitropic's existing recharge and storage capacity, the proposed Project would provide a critical resource management tool that would support long-term sustainability for agriculture.
- **Statewide Operational Flexibility for Meeting Critical Delta Ecosystem Needs:** The Project's surface storage, combined with Semitropic's existing groundwater banking program (Semitropic Groundwater Bank), would allow for capture and banking of surplus Delta flows south of the Delta that can be used in later, dry periods when Delta diversions need to be curtailed to protect critical ecosystem needs.
- **Expanded Groundwater Conjunctive Use Opportunities:** The Project would expand groundwater conjunctive use opportunities by capturing and temporarily storing floodwaters and other available waters in storage facilities to take advantage of unused groundwater banking capacities in Kern County, thereby allowing for greater water supply benefits at the local, regional and State levels. Furthermore, the Project could enhance Semitropic's conjunctive use opportunities by potentially making water available for banking, exchanges, and transfers with other agencies, including neighboring agencies in Kern County, actions which are covered under the approved National Environmental Policy Act (NEPA) evaluation for the project entitled the *Poso Creek Integrated Regional Water Management Plan: 25-Year Groundwater Banking, Transfer and Exchange Program* and CEQA evaluation entitled *Groundwater Banking and Exchanges within the Poso Creek Plan Area*.
- **Flood Risk Reduction:** For the benefit of local communities, including those impacted by subsidence, additional flood security is provided by diversion of floodwaters from the South Fork of the Kings River and other local rivers to storage within the now dry Tulare Lake.
- **Improved Environmental and Recreational Areas:** The now dry Tulare Lake used to be the largest fresh water lake west of the Mississippi River but presently has only marginal wetlands and marshes. The Project would restore a portion of the lost habitat with intermittent freshwater storage, support waterfowl and migratory bird populations, and renew water-related recreation opportunities for area residents and outdoor-oriented tourists.

1.3 Preparation

In accordance with Sections 15082(a), 15103, and 15375 of the CEQA Guidelines, a Notice of Preparation (NOP) of a Draft EIR was prepared and circulated for review to local, state and federal agencies and the public. The NOP was mailed on December 22, 2016 to interested parties, responsible and trustee agencies, and the Office of Planning and Research. Additionally, the NOP was published in the Bakersfield Californian, Fresno Bee, and the Hanford Sentinel and was also posted to Semitropic's website at www.semitropic.com. The 30-day project scoping period began with the distribution of the NOP and concluded on January 27, 2017. During the scoping period, 25 comment letters were received. Appendix A contains a copy of the NOP along with summaries of the comment letters submitted by agencies and the public in response to the NOP and responses to those comments.

In accordance with CEQA Guidelines Section 15125 (a), a public scoping meeting was held on January 12, 2017 from 4:00 p.m. to 7:00 p.m. at Bravo Farms, 33341 Bernard Drive, Kettleman City, CA 93239, to receive public comments on the scope and content of the Draft EIR. A public notice was placed in three

public newspapers of general circulation in the project service area, including the Bakersfield Californian, Fresno Bee, and the Hanford Sentinel. The scoping meeting was conducted as an open-house format and presented the proposed Project. Comments received, if any, during the scoping meeting as presented in Appendix A.

1.3.1 Issues to be Evaluated

The scope of this Draft EIR includes the areas of consideration identified in the NOP, as well as issues raised by agencies and the public in response to the NOP, which include, but are not limited to:

- Attraction of wildlife and migratory waterfowl to the Project area
- Compliance with existing legislation and obtaining required permits (See **Section 1.5.1** below)
- Costs and operational effects to other water agencies in the region
- Protection of cultural resources
- Effects on nearby landowners' water availability and quality
- Impacts to the groundwater basin, including groundwater recharge projects and groundwater table level
- Threatened and endangered species in the Project area
- Water rights appropriation

1.4 Type of EIR

This Draft EIR includes an evaluation of the Tulare Lake Storage and Floodwater Protection Project. All impacts analyzed in this EIR, including those determined to be less than significant, are summarized in **Table ES-1** in the *Executive Summary* of this document.

1.5 Review and Use of the Draft EIR

Upon completion of the Draft EIR, Semitropic filed a Notice of Completion (NOC) with the State Office of Planning and Research to begin the 60-day public review period (Public Resources Code, Section 21161). Concurrent with the NOC, this Draft EIR has been distributed to responsible and trustee agencies, other affected agencies, surrounding cities, and interested parties, as well as all parties requesting a copy of the EIR in accordance with Public Resources Code 21092(b)(3). During the public review period, the Draft EIR and technical appendices are available for review at Semitropic's main office, located at the address provided below. Agencies, organizations, and interested parties, including those not previously contacted, or who did not respond to the NOP, currently have the opportunity to comment on the Draft EIR during the public review period.

Written comments on this Draft EIR should be addressed to:

Semitropic Improvement District of Semitropic Water Storage District
P.O. Box 8043
1101 Central Avenue
Wasco, CA 93280-0877

Attention: Isela Medina, Staff Engineer
Phone: 661-758-5113
Email: imedina@semitropic.com

Upon completion of the public review period, proposed written responses to comments made by public agencies will be made available to commenting public agencies at least 10 days prior to the meeting at which certification of the Final EIR will be considered by Semitropic's Board of Directors, to the extent required by CEQA. Comments received and the responses to comments will be included as part of the record for consideration by the Board of Directors.

1.5.1 Responsible Agencies, Permits, and Approvals

According to Section 15121 of the State CEQA Guidelines, an EIR is a public document used by a public agency to analyze the potentially significant environmental effects of a proposed project, to identify alternatives, and to disclose possible ways to reduce or avoid possible environmental damage. As an informational document, an EIR does not recommend for or against approving a project. The main purpose of an EIR is to inform governmental decision makers and the public about potential environmental impacts of the project. Accordingly, this EIR would be used by Semitropic's Board of Directors, as the decision-making body of the lead agency under CEQA, in making decisions with regard to approval of the proposed Project including implementation of the improvements described herein.

The information in this EIR may also be used by the responsible agencies identified below in deciding whether to grant permits or approvals necessary to construct or operate the proposed Project described in this EIR.

Table 1-1: Permits and Approvals Needed

Agency	Type of Approval
FEDERAL	
U.S. Army Corps of Engineers (USACE)	Clean Water Act, Section 404 Permit for any fill of wetlands or waters of the U.S.
U.S. Fish and Wildlife & National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service	Section 7 Endangered Species Act Consultation/Biological Opinions
STATE	
California Department of Water Resources (DWR)	Approval of Division of Safety of Dams (DSOD) for storage facilities in excess of 6 feet in height
DWR	Agreements for or approvals of Aqueduct Turn-in/Turn-out ; State Water Project (SWP) Pump-in Proposal (PIP); Aqueduct Storage and Conveyance of Non-Project Water; Storage/Banking of Water in Kings County and Kern County; and/or transfers or exchanges (as necessary)
DWR	DWR Encroachment Permit, Construction and Post-Construction Emergency Action Plan
Central Valley Regional Water Quality Control Board (CVRWQCB)	Clean Water Act, Section 401 Water Quality Certification
CVRWQCB	Notice of Intent for coverage under Statewide Construction Stormwater Permit (Section 402 Clean Water Act)
CVRWQCB	Notice of Intent for coverage under Low-Threat Discharge Order for Dewatering during Construction and for Pipeline Discharges for Testing and Startup
State Water Resources Control Board (SWRCB)	Approval of Water Rights Application to Appropriate Kings River Water
Central Valley Flood Protection Board	Possible permit for improvements to water facilities, including to Empire Weir No. 2, as necessary
California Department of Fish and Wildlife (CDFW)	Streambed Alteration Agreement for pipeline crossings of streams and substantial diversions of water
CDFW	Incidental Take Permit under California Endangered Species Act (CESA)
CA Office of Historic Preservation	Consultation under Section 106 of the National Historic Preservation Act
Caltrans	Permits required in event of construction activities occurring within the rights-of-way of Caltrans; encroachment permits

Agency	Type of Approval
LOCAL/OTHER	
Kings County and/or other counties	Encroachment permit (as needed)
San Joaquin Valley Air Pollution Control District	Authority to Construct
Pacific Gas & Electric Company (PG&E)	Coordination Study for Tie-in; Preliminary Engineering Study Plan Agreement; Distribution Service and Extension Agreement; Landowner easement
NAHC and tribe(s)	AB 52 Compliance consultation
Kern County Water Agency; Dudley Ridge Water District; and/or other applicable SWP Contractors	Agreements for or approvals of Aqueduct Turn-in/Turn-out; PIP; Aqueduct Storage and Conveyance of Non-Project Water; Storage/Banking of Water in Kings County and Kern County; and/or transfers or exchanges (as necessary)
Tulare Lake Reclamation District No. 761 and/or other local, state or federal governmental agencies including special districts	Institutional agreements or approvals to implement the Project, as necessary

1.6 Organization of the EIR

This Draft EIR is organized into the following main chapters:

Executive Summary. This chapter includes a summary of the Tulare Lake Storage and Floodwater Protection Project and the alternatives evaluated. It includes a table that summarizes the impacts, mitigation measures, and level of significance after mitigation measures are incorporated.

Chapter 1: Introduction. This chapter provides an introduction and overview describing the purpose, need, and objectives of the proposed Project; purpose and scope of this Draft EIR; brief explanation of the areas of consideration and issues to be resolved; a summary of the CEQA review process; and a list of responsible agencies and approvals.

Chapter 2: Project Description. This chapter includes a detailed description of the proposed Project, including a discussion of the proposed location, operations, equipment and processes, and construction methods.

Chapter 3: Environmental Analysis. This chapter analyzes the environmental impacts of the proposed project. Each topic area includes a description of the environmental setting, methodology, significance criteria, impacts, mitigation measures, and significance after mitigation.

Section 3.1: Introduction to Environmental Analysis. This section provides an overview of the environmental analysis and presents the format for each topical section. It describes issues that have been determined to have no or less-than-significant impacts and, therefore, are not carried forward for further analysis. This section also describes of related projects that may be developed in the area.

Section 3.2: Aesthetics. This section evaluates impacts on the visual and scenic resources.

Section 3.3: Agriculture and Forestry Resources. This section evaluates potential impacts to agricultural or forestry resources in the area.

Section 3.4: Air Quality. This section addresses local and regional air quality impacts, as well as consistency with San Joaquin Valley Air Pollution Control District (SJVAPCD) rules and regulations.

Section 3.5: Biological Resources. This section addresses impacts on habitat, vegetation, and wildlife; the potential degradation or elimination of important habitat; and impacts on listed, proposed, and candidate threatened and endangered species.

Section 3.6: Cultural Resources. This section addresses impacts on known historical resources and potential archaeological and paleontological resources.

Section 3.7: Geology, Soils and Seismicity. This section evaluates the potential for local geological hazards to impact facilities.

Section 3.8: Greenhouse Gas Emissions. This section addresses the potential for construction and operations on the generation of greenhouse gases (GHG).

Section 3.9: Hazards and Hazardous Materials. This section addresses the likelihood of the presence of hazards and hazardous materials or conditions on the project site that may have the potential to impact human health.

Section 3.10: Hydrology and Water Quality. This section addresses impacts on local hydrological conditions, including drainage areas, and changes in water quality.

Section 3.11: Land Use and Planning. This section evaluates compatibility with existing land use; consistency with applicable local, regional, and state plans and policies; and impacts on recreational facilities.

Section 3.12: Noise. This section addresses potential construction and operational noise impacts from mobile and stationary sources. The section also addresses the impact of noise generation on neighboring land uses.

Section 3.13: Oil, Gas and Mineral Resources. This section addresses the impact of oil and mineral resources within the proposed Project area.

Section 3.14: Population and Housing. This section evaluates impacts on population and housing within the proposed Project area.

Section 3.15: Public Services. This section evaluates impacts on police and fire protection services.

Section 3.16: Recreation. This section evaluates potential impairments to recreational uses (e.g. parks, bikeways, fishing access, etc.) and resources in the Project area.

Section 3.17: Transportation. This section addresses impacts on the local and regional roadway system, public transportation, bicycle, and pedestrian access.

Section 3.18: Utilities and Service Systems. This section evaluates impacts on water, wastewater, solid waste, and utility systems.

Chapter 4: Other CEQA Considerations. This chapter describes potential growth-inducing impacts associated with the proposed Project, a summary of significant environmental impacts, including unavoidable and cumulative effects, and the Project's irreversible and irretrievable commitment of resources.

Chapter 5: Alternatives. This chapter compares the impacts of the proposed Project with other alternatives considered by Semitropic, including the No Project Alternative. The environmentally superior alternative is evaluated.

Chapter 6: Document Preparation. This chapter lists the authors who assisted in the preparation of the Draft EIR, by name and company or agency affiliation.

Chapter 7: References and Persons Consulted. This chapter contains a full list of references that were used in the preparation of this Draft EIR, and includes a list of persons and organizations that were consulted with during the preparation of the EIR.

Appendices. This section includes all notices and other procedural documents pertinent to the Draft EIR, as well as all technical material prepared to support the analysis.

Chapter 2 Project Description

Semitropic is proposing the construction and operation of the Tulare Lake Storage and Floodwater Protection Project. The Project would provide local, regional, and statewide public benefits to meet California's water storage and supply challenges by improving the management of floodwaters from the Kings River. The Project would also allow for possible future management or regulation of other waters, including flood flows from streams tributary to Tulare Lake region (which principally include the Kaweah and Tule Rivers) and regional and statewide water supplies, including high flows from the Sacramento-San Joaquin Delta. The Project would manage available waters by developing new surface water storage and conveyance facilities and utilizing existing facilities and groundwater conjunctive use capacity south of the Delta to provide for groundwater banking of floodwaters and surplus surface waters. Water storage would be created by the construction of a leveed impoundment on approximately 16,700 gross acres within the dry Tulare Lake bed. Of the approximately 16,700 gross acres, approximately 12,000 net acres would be developed into a single surface storage reservoir with multiple interior storage cells and a water surface area of approximately 10,240 acres. The levees of the reservoir would be six to eight feet in height, resulting in a total storage capacity of approximately 15,000 to 30,000 acre-feet (AF)[1], respectively.

Available waters would be conveyed to and through the proposed Project storage reservoir (Kettleman Reservoir) constructed in the dry Tulare Lake bed through a combination of new and existing channels and canals; however, some improvements to existing conveyance facilities may be necessary. Depending on the location, canal-side pumping plants may be required to pump water from the conveyance canals into the reservoir. The proposed Project would include a new conveyance facility (the Kettleman Canal) to convey water from the South Fork Canal to the Kettleman Reservoir and/or the California Aqueduct. The proposed Project would also include a second new conveyance facility, referred to as the Aqueduct Intertie, to convey water in both directions between the storage reservoir and the California Aqueduct. The Aqueduct Intertie would have a capacity of up to approximately 2,100 cubic feet per second (cfs) and would consist of a pumping plant (Kettleman Pumping Plant #2), up to three 144-inch inside-diameter (ID) pipelines between the pumping plant and the Aqueduct, and a turn-in/turn-out structure on the east side of the Aqueduct.

Water stored in and conveyed through the Project reservoir would ultimately be transported, as capacity is available, into the California Aqueduct, principally for delivery to the Semitropic service area to meet water needs of existing irrigated lands. Water diverted from the Aqueduct would be delivered to meet direct demands or stored underground by use of groundwater storage facilities and, to a lesser extent, surface storage facilities accessible from the Aqueduct, including in-lieu and direct recharge facilities of Semitropic's in Kern County. Stored (banked) water would be recovered through extraction and/or by way of exchange, and delivered to primarily meet the demands of existing irrigated lands in Kern County and Kings County.

2.1 Project Area and Location

The Tulare Lake basin covers approximately 17,000 square miles at the southern end of the San Joaquin Valley. It is an area bounded by the Sierra Nevada to the east, the Tehachapi Mountains to the south, the Coast Ranges to the west, and by a broad ridge between the San Joaquin and Kings Rivers on the north. Historically, the Kings, Kaweah, and Tule Rivers flowed into the Tulare Lake bed (a former freshwater lake with residual wetlands and marshes in the southern San Joaquin Valley), and the Kern River flowed into the Kern, Buena Vista, and Goose Lake beds or into adjacent wetlands and marshes. Development of

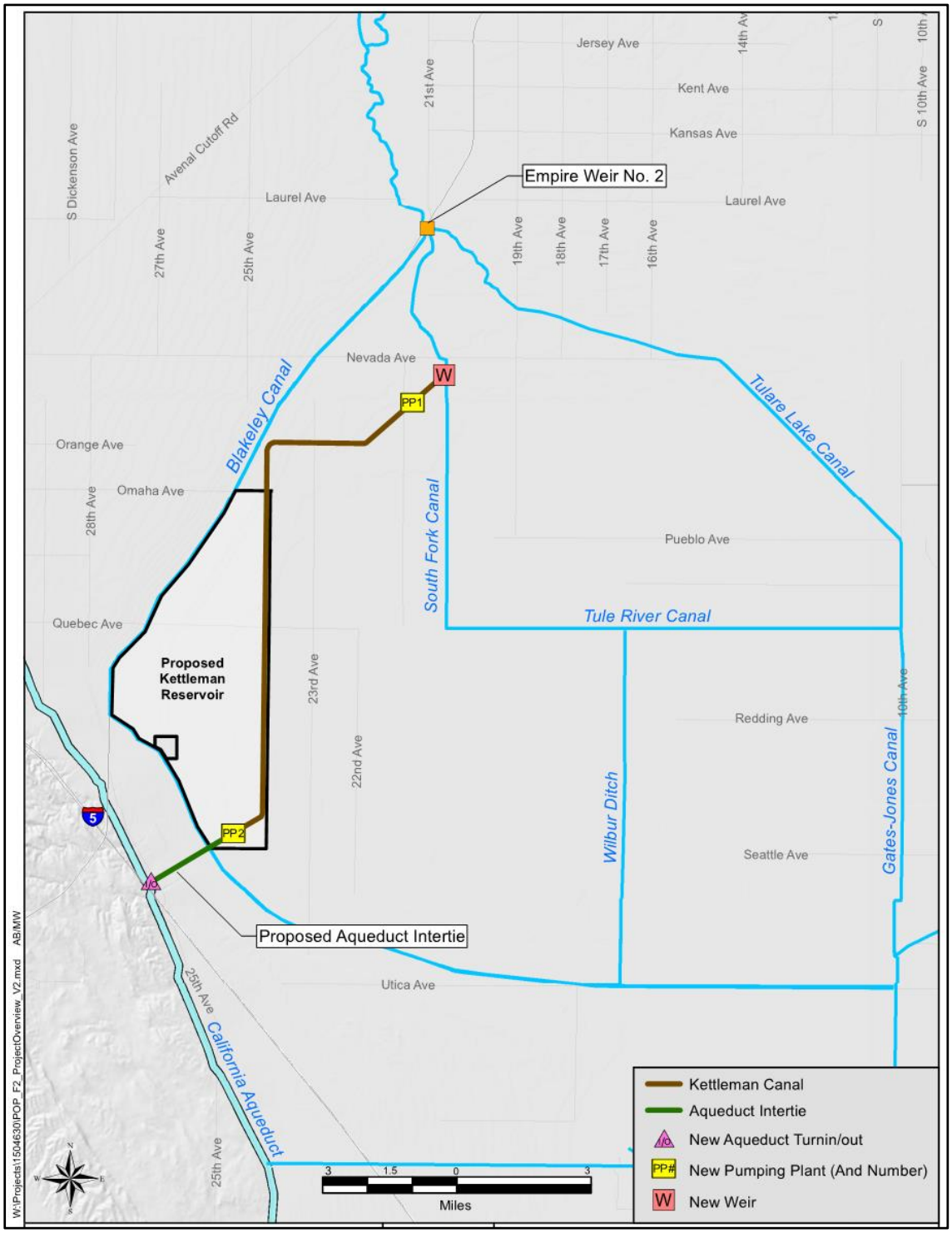
[1] An acre-foot equals 325,851 gallons.

water supply and flood management projects on these rivers and drainage facilities in the lake beds have transformed the lake beds into productive agricultural lands. The Kings River, originating in Kings Canyon National Park, is regulated by Pine Flat Reservoir. Downstream of the reservoir, the South Fork of the river flows to the Tulare Lake bed, and the North Fork flows to Fresno Slough. During periods with flood releases from Pine Flat Reservoir, portions of Kings River flow are diverted through the James Bypass/Fresno Slough system to the San Joaquin River basin or may flow through Fresno Slough to Mendota Pool along the San Joaquin River.

The Project would be located to the east of Interstate 5 and State Highway 41, near Kettleman City, in Kings County, California, north of the Kings-Kern County line. The Project would be located within a portion of the historic Tulare Lake bed, on lands currently used for dry grazing and cultivated agriculture (primarily almond orchards and alfalfa). Tulare Lake is the low elevation point in the Tulare Lake Basin and the receiving area for the drainages from the Kings, Kaweah, Tule, and Kern Rivers. The Project area where new facilities would be constructed is located to the north of Semitropic's existing service area and upstream from Semitropic's three existing turnouts in Reach 10A of the Aqueduct.

The Project would include the construction of one surface storage reservoir with multiple interior storage cells along the western perimeter of the historic Tulare Lake, an intertie between the storage facilities and the California Aqueduct with a capacity of up to approximately 2,100 cfs in both directions, a new canal between the South Fork Canal and the proposed Aqueduct Intertie, and improvements to the existing Empire Weir No. 2, South Fork Canal, and Blakeley Canal to divert and convey water to and from the new storage facilities and Aqueduct intertie. Associated pumping plants would be installed on applicable pipelines and canal segments, in addition to the construction and operation of ancillary facilities such as an electrical substation and maintenance yard. **Figure 2-1** shows the primary new infrastructure associated with the proposed Project. New Project facilities would generally be bounded by Kettleman City to the west, Utica Avenue to the south, Gates-Jones Canal on the east, and the Blakeley Canal and Tulare Lake Canal on the north.

Figure 2-1: Proposed Project Facilities



2.2 Existing Facilities

The proposed Project would use some of the water-related infrastructure presently located in the Project area. This infrastructure includes Empire Weir No. 2 (to divert surface water from the South Fork of the Kings River into the South Fork and Blakeley Canals), the South Fork Canal, the Blakeley Canal, and possibly several adjacent canals, including the Tulare Lake Canal, Wilbur Ditch and Gates-Jones Canal, for conveying water to the new storage reservoir, and the California Aqueduct. Water delivered to the California Aqueduct would be conveyed to storage facilities in Kern County, including the Semitropic Groundwater Bank, located within Semitropic's boundaries in northern Kern County, and places of use in Kern and Kings Counties.

2.2.1 Existing Conveyance Facilities

The Project area has numerous existing channels and canals of varying sizes. Some of these channels and canals would be used to convey flood flows and other available waters from the Kings River and other tributaries to the proposed new storage reservoir. The primary conveyance facilities utilized by the Project are the Empire Weir No. 2, South Fork Canal, Blakeley Canal and the California Aqueduct. However, other existing conveyance facilities that may be used in their existing condition for conveyance of flood water to the storage reservoirs include the Tulare Lake Canal, Wilbur Ditch, and the Gates-Jones Canal.

Empire Weir No. 2

The South Fork of the Kings River is also known as Clark's Fork before it turns south and is used to convey irrigation water to canals that divert from Empire Weir No. 1 and Empire Weir No. 2. At Empire Weir No. 2, water can be diverted into the Blakeley Canal, South Fork Canal, and the Tulare Lake Canal. Most flood flows entering the Tulare Lake bed come via the South Fork of the Kings River and the South Fork Canal, and can be measured at Empire Weir No. 2 (ECORP Consulting, Inc., 2007).

Multiple agencies divert water at Empire Weir No. 2, including the Tulare Lake Basin Water Storage District and Tulare Lake Reclamation District No. 761 (KRCD and KRWA, 2009).

South Fork Canal

The South Fork Canal begins at Empire Weir No. 2, the terminus of the South Fork of the Kings River. The canal runs north to south from Empire Weir No. 2, paralleling 20 ½ Avenue. One-half mile south of Hanford-Armona Road, the South Fork of the Kings River combines with Clark Fork. From that point on downstream, it is known as the South Fork of the Kings River, ultimately terminating at Empire Weir No. 2.

From Empire Weir No. 2, the South Fork Canal meanders for a few miles before being channeled directly south to the lowest point of the Tulare Lake bed. There, it intersects the Tule River Canal from the east at a point 12 miles west of Corcoran. The Tulare Lake Basin Water Storage District manages South Fork Canal water deliveries at Empire Weir No. 2, near Stratford in Kings County. Lovelace Water Corporation provides water deliveries through the South Fork Canal. The Army Corps of Engineers lists the South Fork of the Kings River capacity as 3,100 cfs south of the approximately alignment of the Hanford-Armona Road (KRCD and KRWA, 2009).

Along with Empire Weir No. 2, the South Fork Canal would be the primary conveyance structure for the movement of floodwaters from the South Fork of the Kings River into Project facilities. The upper portion of the South Fork Canal would be utilized to the intersection with the proposed new Kettleman Canal (see Section 2.4, below).

Blakeley Canal

The Blakeley Canal may be used as a secondary means to convey floodwaters from the Kings River to the surface storage reservoir. The Blakeley Canal is an irrigation supply canal operated by Tulare Lake Reclamation District No. 761. The canal begins at the Empire Weir No. 2, and runs in a southwesterly direction for approximately thirty miles, terminating at Utica Avenue. (Diversion facilities exist that are capable of conveying excess water into other canals beyond Utica Avenue.) It is estimated that the canal currently has varying capacity ranging from approximately 150 to 500 cfs.

California Aqueduct

The California Aqueduct is the centerpiece of the State Water Project. The Aqueduct is a 444-mile long inverted trapezoidal concrete channel that carries water from the Delta to the San Joaquin Valley and Southern California. Varying in bottom width from 12 feet to 85 feet and with an average depth of 30 feet, the Aqueduct uses check structures with an innovative "controlled volume flow" system to move water through an open canal much as a pipeline would (WEF, 2017).

About 30 percent of SWP water is delivered to San Joaquin Valley farms and cities via the California Aqueduct. The largest single agricultural contractor is the Kern County Water Agency, which contracts for nearly 1 million acre-feet of SWP Table A annual amount. Just south of Kettleman City, the Coastal Branch diverges from the main Aqueduct to deliver water to Santa Barbara and San Luis Obispo Counties. By the time the California Aqueduct reaches the southern boundary of the San Joaquin Valley, the Aqueduct is carrying as much as 2.5 million acre-feet of water to be delivered to 13 Southern California water contractors (WEF, 2017).

The California Aqueduct is also presently used to convey to Semitropic its SWP water and deliveries from its Banking Partners for storage in the Semitropic Groundwater Bank, including the Stored Water Recovery Unit.

Other Canals

Other canals that could potentially be used by the Project for water conveyance are shown in **Figure 2-1**. The Tulare Lake Canal runs from north to south, to the east of the South Fork Canal. The northern extent of this canal is Empire Weir No. 2, and from there, it follows a winding path southeast to S 19th Avenue, just north of Manteca Avenue. From this point, the canal continues to the southeast until the intersection at Pueblo Avenue, at which point it turns to the south and parallels 10th Avenue to the Tule River. The Gates-Jones Canal begins at the terminus of the Tulare Lake Canal and runs north-south along 10th Avenue to the intersection with Utica Avenue. This canal is located near El Rico Ranch. Finally, the Wilbur Ditch is located near Pelican Island and La Rambia and runs north-south from the intersection with the Tule River to Utica Avenue. This canal is approximately 2.5 miles in length.

2.2.2 Other Existing Facilities and Programs

Proposed reservoir and related facilities constructed in the dry Tulare Lake bed would be coordinated and integrated with the use of other existing facilities located inside and outside the boundaries of Semitropic and possibly other water management programs, as described below.

Semitropic Groundwater Banking Program

The Semitropic Groundwater Banking Program (Semitropic Groundwater Bank) provides both in-lieu (indirect) and direct recharge storage of water underground. The Semitropic Groundwater Bank began operation in the early 1990's, and it is one of the largest groundwater banks in operation with an approved storage capacity of approximately 1.65 million AF. The goal of the bank has been to provide long-term underground storage of surplus SWP water and other supplies to stabilize declining groundwater levels and to provide drought supplies to banking partners. Semitropic banking partners include: Metropolitan Water District of Southern California, Santa Clara Valley Water District, Zone 7 Water Agency, Alameda County Water District, Newhall Land and Farming Company, San Diego Water Authority, the City of Tracy, Castaic Lake Water Agency, Homer, LLC, Poso Creek Water Company, LLC, and Harris Ranch.

Water is traditionally stored in the Semitropic Groundwater Bank when the banking partners make their SWP or other surplus water supplies available to Semitropic. These surface supplies are delivered to landowners (farmers) in Semitropic's service area in-lieu of their groundwater pumping. There are two mechanisms available to return water to banking partners during extraction years; the first is through SWP entitlement water exchanges (entitlement exchange), where Semitropic delivers pumped groundwater to landowners, and, in exchange, leaves SWP entitlement water in the SWP system for return to the banking partners. The second method occurs in particularly dry years when not enough SWP entitlement is available to meet Semitropic's contractual commitment to return water to the banking partners. Under this condition, Semitropic extracts groundwater and physically delivers it through pump-back facilities to the California Aqueduct (pumpback). Firm return capability (not including the Stored Water Recovery Unit [SWRU]) is up to about 133,000 AFY by entitlement exchange and up to about 90,000 AFY by pumpback to the Aqueduct, for a total firm return capacity of up to approximately 223,000 AFY. Existing infrastructure associated with the Semitropic Groundwater Bank includes recovery wells, Semitropic and landowner wells, conveyance pipelines, regulating basins and pumping plants, and other ancillary facilities. All of these existing facilities are within the Semitropic service area in Kern County, near the City of Wasco and south of the proposed Project's facilities in Tulare Lake. Semitropic certified a final EIR covering the Semitropic Groundwater Bank Project in 1994.

Semitropic's Stored Water Recovery Unit (or SWRU) is a component of the Semitropic Groundwater Bank that was developed to expand the recharge and recovery capacity of banked water for the benefit of existing and future banking partners and for Semitropic. The SWRU has been evaluated under CEQA and certified by Semitropic in 2000 in a final supplemental EIR (SEIR) to include increased banking capacity through the addition of up to 13,000 acres of in-lieu recharge facilities (which would add approximately 40,000 to 50,000 AFY of recharge capability), additional firm recovery capacity of up to 150,000 AF per year (for the recovery of banked groundwater), and enhanced capacity to deliver recovered water to the banking partners via the California Aqueduct or to Semitropic's service area.

The final 1994 EIR and/or the 2000 SEIR for the Semitropic Groundwater Bank (including SWRU) have been amended by six addenda authorizing various changes including with respect to sizing or location of facilities, and to change the manner of operation to include storage of banking partner water in the Kern Water Bank and Pioneer banking projects when there are insufficient in-lieu irrigation demands in Semitropic. Specifically, each addendum analyzed the following:

- **Addendum No. 1** (February 2002) – This addendum to the SEIR evaluated the impacts of the increase of the defined capacity from one million (1,000,000) acre-feet to one million six hundred fifty thousand (1,650,000) acre-feet, with no additional facilities proposed.
- **Addendum No. 2** (July 2004) – This addendum to the SEIR addressed an increase in diameter (from 96 inches to 120 inches) of approximately seven miles of an east-west pipeline facility, the

substitution of canal for some of the proposed pipeline in the north-south conveyance facilities, and a change in the configuration of the proposed regulating pond near the Pond-Poso Canal.

- **Addendum No. 3** (August 2005) – This document served as the First Addendum to the 1994 EIR in addition to amending the SEIR. The addendum made one change to the manner of operation of the Groundwater Banking Project. In particular, it identified additional points of delivery of water to be banked at the Project, and did not require any changes to either existing or planned facilities.
- **Addendum No. 4** (October 2008) – This Addendum to the SEIR addressed an increase in pipeline diameter (from 84 inches to 108 inches) of approximately 0.7 miles of the north-south conveyance system, the substitution of approximately two and one-half miles of canal for an equal length of pipeline for the north-south conveyance system, a change in the location of two of the approved pumping plant facilities, and a change in the alignment of a portion of the north-south pipeline and canal facilities.
- **Addendum No. 5** (February 2015) – This Addendum to the SEIR made further modifications to the design of the north-south conveyance system, and changed the source of the electrical service for the operation of the SWRU's wells and pumping plants.
- **Addendum No. 6** (March 2016) – This Addendum to the SEIR alters the spatial distribution of the wells to be constructed.

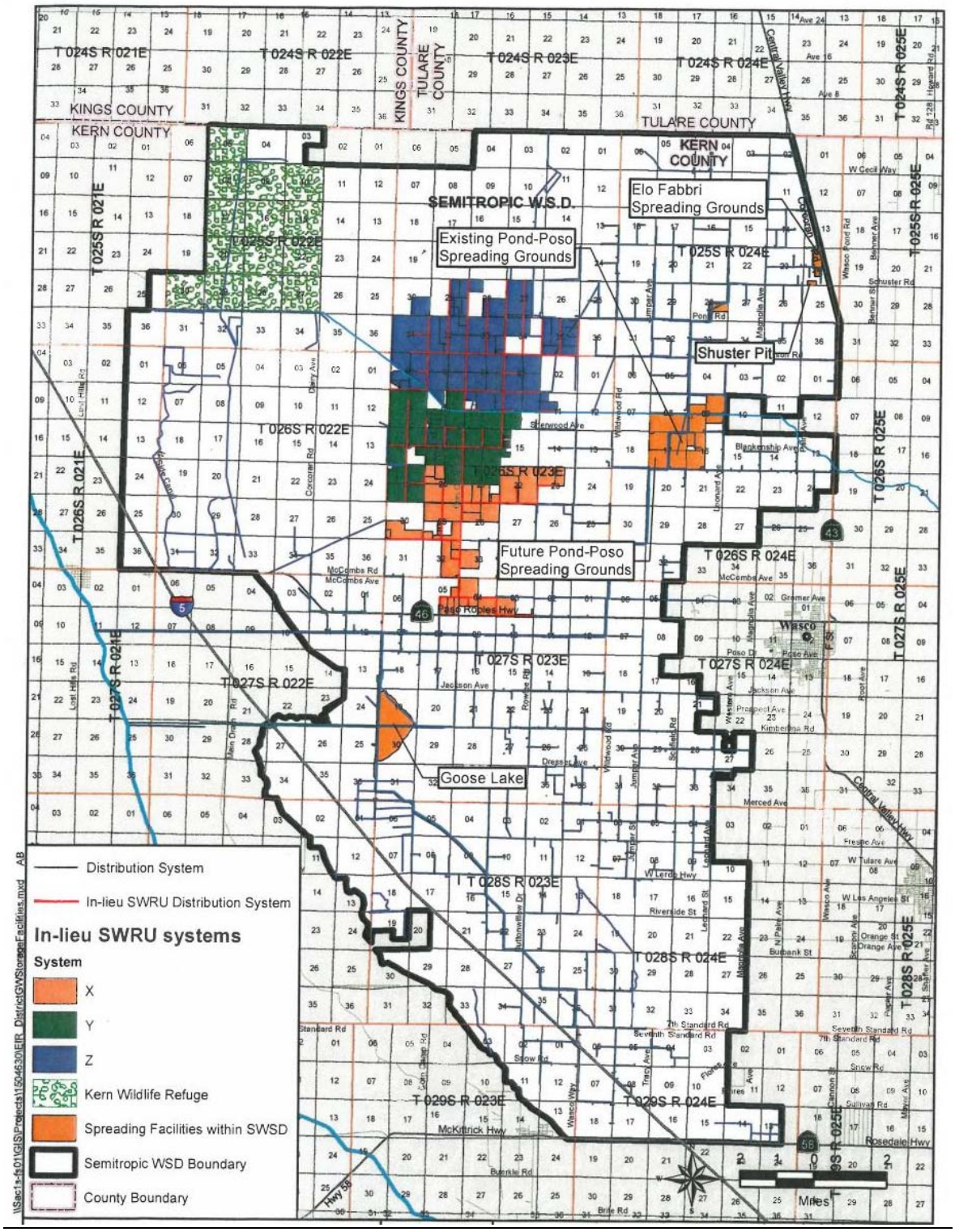
In addition, in 2007, Semitropic prepared and approved an Initial Study and Negative Declaration for the Pond-Poso Spreading Grounds Unit of the Semitropic Groundwater Bank. This unit includes thePond-Poso Spreading Grounds connected to SWDS's Pond-Poso Canal, consisting currently of about 580 net acres plus about 490 planned net acres, principally used for underground storage of water by way of direct recharge, and related-water facilities.

Semitropic's groundwater banking operations are subject to various mitigation measures described in mitigation monitoring and reporting programs associated with each EIR and addenda, and which include a groundwater monitoring committee for the Bank and certain operational criteria to ensure Semitropic landowners and landowners in neighboring districts do not suffer unmitigated significant adverse impacts.

Additional Semitropic Water Storage Facilities

Semitropic uses certain other facilities within its boundaries in addition to the facilities of the Semitropic Water Bank, for direct recharge and/or surface storage. These facilities include the dry channel of Poso-Creek, the Shuster Pit, the Pond Poso Spreading Grounds (both existing and planned future facilities – described above), the Elo Fabbri Spreading Grounds, Goose Lake, and spreading conducted by individual landowners. **Figure 2-2** shows the location of these facilities relative to the Semitropic Groundwater Bank SWRU. In addition, in 2017, Semitropic approved a pilot program for "on-farm" recharge of water (particularly floodwaters) on certain lands within Semitropic.

Figure 2-2: Semitropic Groundwater Storage Facilities



Inter-District Conveyance Facilities

To facilitate mutually beneficial water banking and exchange arrangements with neighboring water districts, including access to alternative sources of water supplies, Semitropic's water distribution system includes established inter-connection facilities with the following districts:

- Buena Vista Water Storage District (60 cfs)
- Shafter-Wasco Irrigation District (30-35 cfs each way)
- North Kern Water Storage District (80 cfs each way after installation of one additional 40 cfs pump/motor unit)

Semitropic has existing agreements with these districts, which provide for banking and exchanges of water.

Additional Banking Facilities

Semitropic has agreements with other banking facilities for the storage of water supplies. These banking facilities are described below.

Kern Water Bank

The Kern Water Bank is a direct recharge-based project, with over 7,000 acres of spreading basins. The Kern Water Bank Authority developed and constructed the Kern Water Bank after implementation of the Monterey Amendment beginning in 1996 by the DWR and all by two of the State Water Contractors. With a gross area of about 20,000 acres, the Kern Water Bank is located to the south of Semitropic, astride the Kern River, and has the ability to convey water to and from Aqueduct. Semitropic is a member entity of the Kern Water Bank Authority and has rights to store and recover water from the bank.

Pioneer Project

The Pioneer Project is operated by the Kern County Water Agency and is a direct recharge-based water banking project, located on approximately 2,233 acres within the Kern fan, adjacent to the Kern Water Bank. Similar to the Kern Water Bank, the Pioneer Project has the ability to convey water to and from the Aqueduct. The Pioneer Project has "recharge participants" and "recovery participants"; the former are vested with a first priority right to use of the recharge facilities, and the latter are vested with a first priority right to use of the recovery facilities. Semitropic is a "recovery participant", and Semitropic's right to use the Pioneer Project's recharge capacity is second to that of the "recharge participants".

City of Bakersfield 2800 Acres

The 2800 Acres recharge project is owned and operated by the City of Bakersfield as a direct recharge and recovery project. With a gross area of 2,800 acres, the project is located astride the Kern River and has the ability to convey water to and from the Aqueduct. Semitropic has rights to recharge and recovery water from the 2800 Acres, as a participant of the Pioneer Project.

Regional Banking, Transfer and Exchange Water Management Programs

Water captured by the Project may also be delivered to neighboring and other water districts in Kern County through use of the Aqueduct and other existing facilities (including those mentioned above) as part of existing or future banking, exchange, and transfer programs, subject to the approval of those entities with discretionary approval over the supplies and facilities as applicable. For example, in 2005, the Poso Creek Regional Water Management Group (RWMG) was formed to focus on improving water supplies through the Poso Creek Region (Region), which includes four Central Valley Project (CVP) contractors (Delano-Earlimart Irrigation District; Kern-Tulare Water District; Shafter-Wasco Irrigation District; and Southern San Joaquin Municipal Utility District) and three non-CVP contractors (Semitropic; North Kern Water Storage District, and Cawelo Water District). In 2007, the Poso Creek RWMG adopted an Integrated

Regional Water Management Plan (IRWMP) which describes and proposes solutions to the Region's short-term and long-term water supply shortage challenges. The IRWMP was subsequently updated in 2014. In 2010, Semitropic, as lead agency, adopted a negative declaration pursuant to CEQA for a project for groundwater banking and exchanges within the Poso Creek [IRWMP] Plan Area. Among other things, the project allows for groundwater banking and exchanges between said districts using any supplies available. This project generally involves coordinating wet-period supplies and limited available absorptive capacity with districts that have direct recharge and/or in-lieu recharge facilities with the capacity to absorb the wet-period supply at the time the water is available. Similar groundwater banking and exchanges are also covered by a U.S. Bureau of Reclamation's (USBR's) NEPA Finding of No Significant Impact (FONSI) finalized in May, 2012, and related Final Environmental Assessment (EA) 09-121 – *Poso Creek Integrated Regional Management Plan: 25-Year Groundwater Banking, Transfer and Exchange Program*; and NEPA FONSI finalized in March, 2017, and related EA 16-036 for *Southern San Joaquin Municipal Utility District (SSJMUD) – Poso Creek Integrated Regional Management Plan*.

Integrated use of the above for storage or recovery (including groundwater banking and exchanges) of Project water is not expected to require construction of new facilities in addition to proposed Project facilities (except for possible additional SWRU facilities and Pond-Poso Spreading Grounds which have previously been evaluated pursuant to CEQA), and would be subject to all mitigation measures and other commitments applicable to the same.

2.3 Proposed Project Facilities

Proposed Project facilities include one new surface storage reservoir with multiple interior storage cells (Kettleman Reservoir); improvements to Empire Weir No. 2; a new conveyance canal (Kettleman Canal) with a pumping plant (Kettleman Pumping Plant #1) and weir structure (Kettleman Weir) off of the South Fork Canal; a new intertie facility between the surface storage reservoir and the California Aqueduct (Aqueduct Intertie) consisting of a turn-in/turn-out structure on the Aqueduct, a pumping plant (Kettleman Pumping Plant #2) and up to three parallel pipelines between the turn-in/turn-out structure and the pumping plant; and several new ancillary facilities including a new electrical substation and a new maintenance yard. The Project facilities would located on roughly 16,700 acres on the western perimeter of Tulare Lake.

2.3.1 Storage Facilities

Kettleman Reservoir.

The proposed Project includes one storage facility, the Kettleman Reservoir. Water would be delivered to the Kettleman Reservoir from the Blakeley Canal by gravity or via the proposed Kettleman Canal by pumping for temporary storage and ultimate delivery to the California Aqueduct. The proposed Kettleman Reservoir would be an above-ground leveed surface storage and regulation reservoir occupying approximately 12,000 acres within the Tulare Lake bed. The reservoir would include multiple internal storage cells with earthen levees ranging generally from between six- and eight-feet in height. This storage reservoir would have a net water surface area of approximately 10,240 acres and a storage capacity of approximately between 15,000 AF and 30,000 AF, based upon levee height (**Table 2-1**).

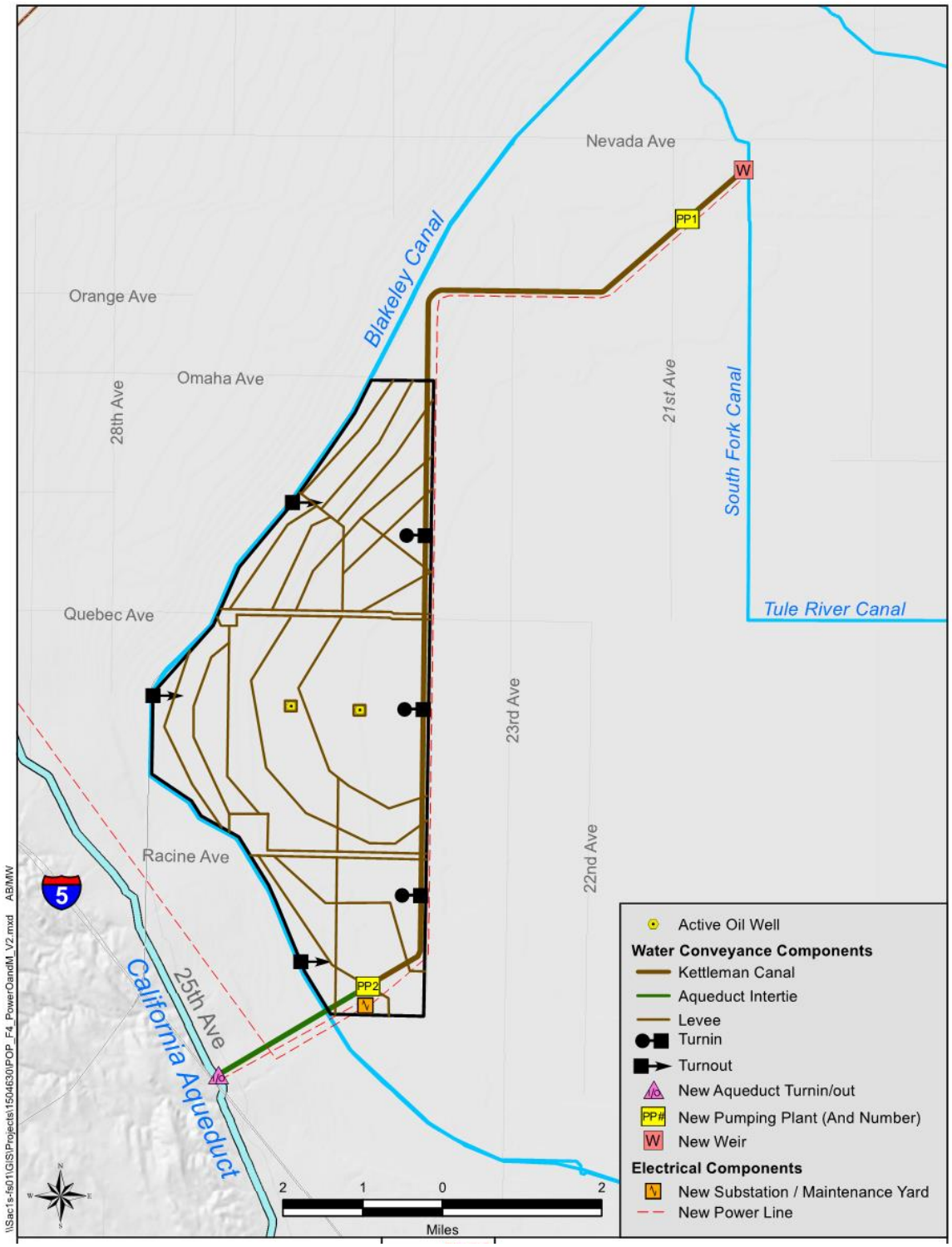
Table 2-1: Tulare Lake Surface Storage Facilities Information

Site Name	Gross Land Area (Acres)	Net Reservoir Surface Area (Acres)	Reservoir Capacity (Acre-Feet)		Total Levee Length (Miles)
			6-ft levees	8-ft levees	
Kettleman	12,000	10,240	15,000	30,000	72

The Kettleman Reservoir would be sited directly east of Kettleman City (**Figure 2-3**). The boundaries of the proposed reservoir are generally east of the Blakeley Canal, south of Omaha Avenue, west of 23rd Avenue, and north of Utica Avenue. The land is currently used as grazing land, agricultural production, or (primarily) fallowed. There are two active oil wells located within the proposed reservoir boundaries; these wells would be protected from inundation by perimeter levees that would also serve as access roads to the facilities. Additionally, two existing county roads run east to west through the proposed reservoir site: Quebec Avenue and Racine Avenue. These two roads, and the canals adjacent to the roads, would be preserved and bridges or siphon crossings would be constructed to accommodate road crossings over/under the Kettleman Canal. The existing canals would be siphoned below the Kettleman Canal through pipelines.

As previously noted, the reservoir would contain multiple interior levees creating smaller storage cells within the reservoir. By adding internal levees, there is the potential to maximize the effective storage volumes with shorter (6-foot) levees. The levees at the deepest side of the reservoir may exceed six feet in order to develop the proposed net reservoir storage volumes. The reservoir would also contain flow regulating facilities to provide a means of managing flow between and within each reservoir cell, including up to five internal pumping facilities to provide a means of pumping into and out of each storage cell and to the Kettleman Canal. The proposed storage facilities would operate independently or conjunctively with existing and potential future storage facilities accessible by Semitropic, including the SWRU.

Figure 2-3: Kettleman Reservoir Site



2.3.2 Conveyance Facilities

Proposed Project conveyance facilities in the dry Tulare Lake bed include the Kettleman Canal and the Aqueduct Intertie, as described below.

Kettleman Canal

Available waters would be diverted from the South Fork of the Kings River at Empire Weir No. 2. Waters would be diverted via the improved weir into the South Fork Canal and conveyed to Kettleman Pumping Plant #1 at rates up to 2,100 cfs for further conveyance southward. If required to meet Project capacity, the Empire Weir No. 2 would be modified to allow for the diversion of up to 2,200 cfs at the structure. Potential modifications to the weir may include increasing the size of the outlet and control structure and deepening the canal to increase flow capacity through the structure.

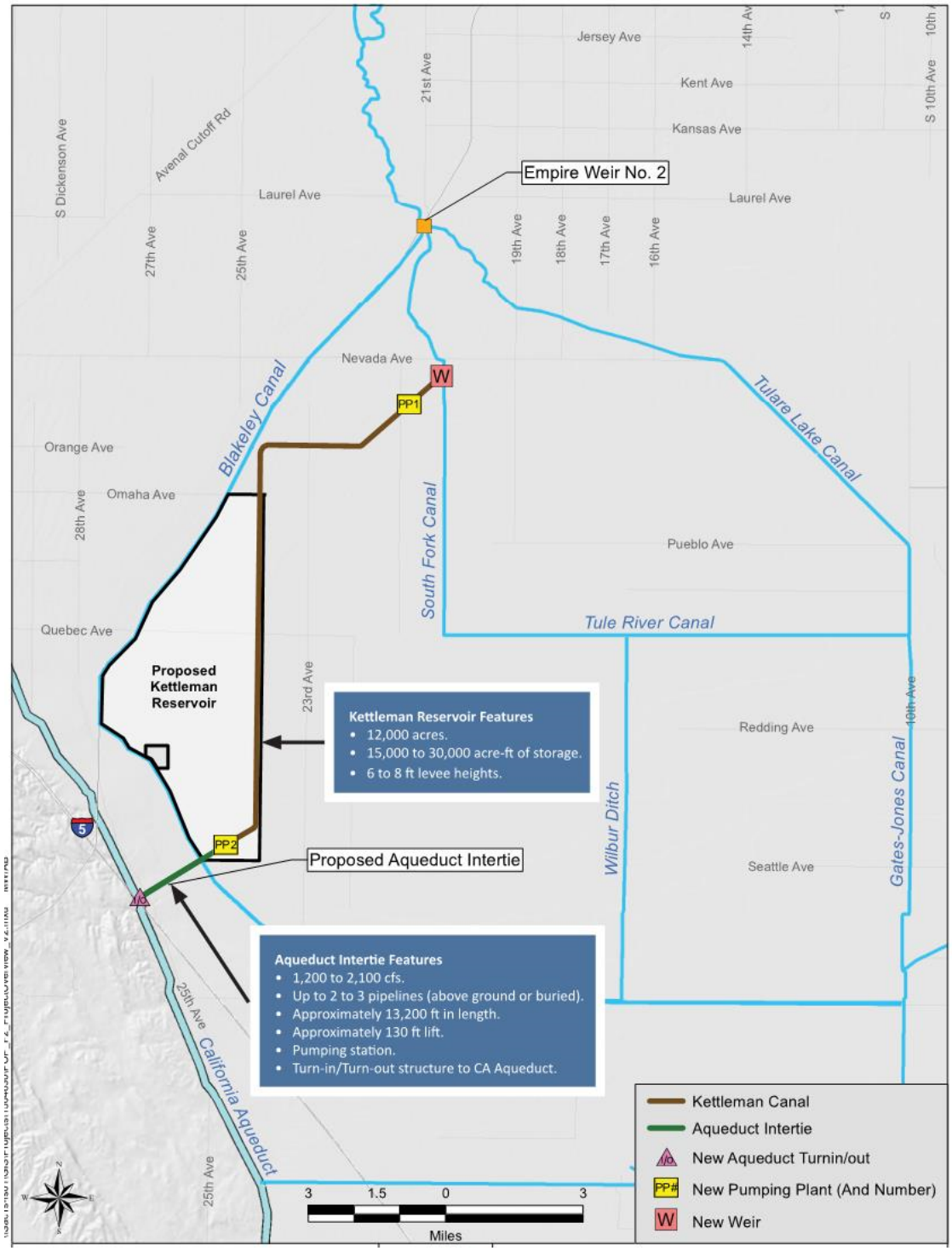
Waters diverted at Empire Weir No. 2 would be conveyed approximately one mile southward in the existing South Fork Canal and diverted via the Kettleman Weir (which includes a diversion structure and a control structure) into the proposed Kettleman Canal through the operation of an in-canal medium lift station (Kettleman Pumping Plant #1) for delivery to the Kettleman Reservoir and/or the Aqueduct Intertie and ultimately to the California Aqueduct. The proposed Kettleman Weir diversion structure would be a concrete structure located on the western levee of the South Fork Canal, adjacent to the proposed Kettleman Canal, to allow diversion out of the South Fork Canal. The Kettleman Weir control structure is proposed to be located perpendicular to and entirely inside the South Fork Canal, downstream of the diversion structure. The control structure would be operated in conjunction with the diversion structure. The control structure would allow the water level in the South Fork Canal to be raised to allow for diversion of flows into the diversion structure and into the Kettleman Canal. The diversion structure would consist of a concrete structure from the South Fork Canal that supports stop log guides and a walkway for access. The control structure would consist of a concrete structure across the South Fork Canal that supports radial gates, stop log guides and a drive deck for access. The Kettleman Pumping Plant #1 would include a concrete sump structure, pump and electric motor units, trashracks, discharge manifold piping and appurtenances, and electrical equipment.

The proposed Kettleman Canal would be approximately 72,000 linear feet in length, and would run from the South Fork Canal diversion point along the northern boundary of the Kettleman Reservoir, and then continue southward through the reservoir to Kettleman Pumping Plant #2, located at the southern reservoir boundary. The canal would be an earthen trapezoidal channel formed by levees on either side, approximately 40-feet wide at the base and 15-feet deep on average. The levees would be approximately 20 feet wide and 2 feet tall, with interior slopes of 3:1 ratio and exterior side slopes at a 2:1 ratio. The levees would have a gravel base on one side for use as an access road to the intertie pumping plant (Kettleman Pumping Plant #2).

The Kettleman Canal would connect to Kettleman Pumping Plant #2 which, in turn, would be connected to up to three 144-inch ID pipes. Water would be conveyed through the Kettleman Canal to Kettleman Pumping Plant #2 where it would be pumped into the pipelines for conveyance to the turn-in/turn-out structure on the eastern bank of the California Aqueduct. The Kettleman Canal alignment is shown in **Figure 2-4**, below.

The Blakeley Canal may also be used to fill the Kettleman Reservoir by diverting (also at Empire Weir No. 2) and conveying up to 100 cfs for storage in the Kettleman Reservoir. Other possible future conveyance canals could include the Tulare Lake Canal, Wilbur Ditch, and Gates-Jones Canal. Depending on the existing canal capacities, improvements such as in-channel cleaning, capacity restoration, canal widening, and canal-side pumping plants may be required to convey and pump floodwater from Empire Weir No. 2 to the surface storage reservoir.

Figure 2-4: Conveyance Facilities



Aqueduct Intertie

A second new conveyance facility, the Aqueduct Intertie, would be required to convey water either directly to the California Aqueduct and/or between the proposed surface storage reservoir (Kettleman Reservoir) and the Aqueduct (potentially in both directions). This new intertie would be located near the southern end of the Kettleman Reservoir site and would consist of a pumping plant (Kettleman Pumping Plant #2), up to three parallel pipelines between the Kettleman Pumping Plant #2 and the California Aqueduct, and a turn-in/turn-out structure on the east side of the Aqueduct with a capacity up to 2,100 cfs. The pipelines would consist of up to three 144-inch ID pipes, each approximately 13,200 linear feet in length. The Aqueduct Intertie would also be used to divert SWP water from the California Aqueduct to the surface storage facility when additional regulating storage south of the Delta is beneficial for water management. **Figure 2-5** shows the intertie facilities that would be used by the proposed Project to connect to the Aqueduct.

As noted above, the Aqueduct turn-in/turn-out structure would be located on the east side of the California Aqueduct, at the terminus of the Aqueduct Intertie. The three proposed 144-inch ID pipes would be located either above or below grade and would emerge under the Aqueduct operations and maintenance (O&M) Road and terminate in a gated structure that opens into the Aqueduct. The gates would be remotely controlled but would be equipped with a manual override.

The landowner has reserved the right to possibly construct its own pipeline parallel to the Aqueduct Intertie, and would, if constructed, utilize the Project turn-in/turn-out structures. Construction of this parallel pipeline is, at this time, speculative in nature. Any construction of and approvals associated with the same would be the sole responsibility and expense of the landowner, and it therefore is not considered to be part of this Project.

2.3.3 Other Facilities

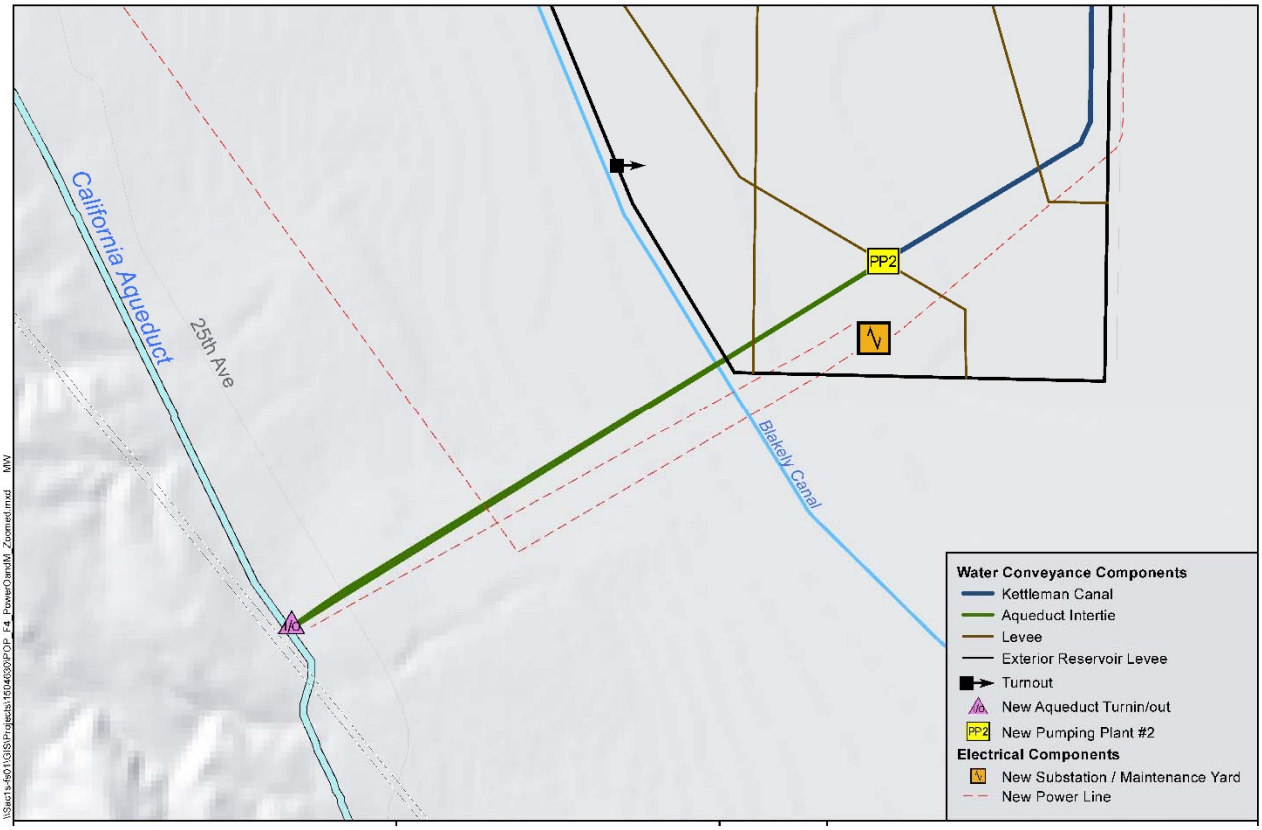
Other new facilities to be constructed as part of the proposed Project include PG&E electrical facilities, a new maintenance yard, and pump stations along the existing canals and within the Kettleman Reservoir (the new surface storage reservoir).

PG&E Electrical Facilities

The proposed Project would include electrical facilities (constructed, owned and operated by PG&E) to provide power to Project facilities, including an interconnection to the existing PG&E 230 kilovolt (kV) High Voltage (HV) Transmission line, a 230 kV to 115 kV switchyard, a new 115 kV to 12 kV electrical substation, and up to 15 miles of 12 kV distribution powerline. Electrical power would enter the switchyard by tapping (interconnecting) to the existing 230 kV power line that runs parallel to Avenue 25. Power would be stepped down from 230 kV to 115 kV via a new switchyard and would enter the new substation at 115 kV. From there, the electrical power would leave the substation as 12 kV via distribution feeder lines, which would interconnect with the distribution powerline network.

The existing PG&E 230 kV line runs parallel with Avenue 25 and is located approximately one half-mile east of Avenue 25. The proposed PG&E interconnection would be located at the intersection of the existing PG&E 230 kV HV line and the Aqueduct Intertie alignment. From the proposed interconnection, a switchyard and substation would be constructed and up to 15 miles of 12 kV distribution line, running parallel to the proposed project facilities, including the Aqueduct Intertie and the Kettleman Canal to power all project facilities. Refer to **Figure 2-5** for the proposed facility location and alignment; the project components are summarized below.

Figure 2-5: Aqueduct Intertie



230 kV to 115 kV Switchyard

Construction of a multi-bank 230/115 kilovolt switchyard which may include the following at full buildout:

- 230 kV bus structures
- 230 kV circuit breakers
- 230/115 kV power transformers
- 230 kV disconnecting switches
- 115 kV metal-clad switchgear enclosures
- 115 kV distribution circuits
- Power transformers
- Connection of the new switchyard to 230 kV power line by way of a new tubular steel pole [TSP] Dead-end structures within the substation supporting the 230-kV power line entering and exiting the substation.

115kV to 12kV Substation

Construction of a multi-bank 115/12 kilovolt substation which may include the following at full buildout:

- 115 kV bus structures
- 115 kV circuit breakers
- 115/12 kV power transformers
- 115 kV disconnecting switches
- 12 kV metal-clad switchgear enclosures

- 12 kV distribution circuits
- Power transformers
- Connection of the new substation to 115 kV power line by way of a new tubular steel pole [TSP]
- Dead-end structures within the substation supporting the 115-kV power line entering and exiting the substation.

The proposed 23 0kV to 115 kV Switchyard and 115 kV to 12 kV Substation would be constructed over a graded and compacted earthen pad, with crushed rock and protected with a chain-link fence.

12 kV Distribution Line

PG&E would construct up to 15 miles of 12 kV above-ground distribution line which would consist of up to 45-foot wood poles (39-feet above ground) at up to 300-foot spacing. As noted in **Figure 2-5**, powerlines would be constructed parallel to new Project facilities to utilize the same rights of way.

Maintenance Yard

The Project would also result in the construction of a new maintenance yard located within the Aqueduct Intertie easement and adjacent to Kettleman Pumping Plant #2. The maintenance yard would be approximately 260-feet by 500-feet in size, and would be surrounded by a chain-link fence. The yard would contain a crushed rock base and would contain possibly two permanent, pre-fabricated metal structures; no permanent water or sewer facilities would be located on the property (**Figure 2-5**). The yard would be accessed using the same levee road used to access the Kettleman Pumping Plant #2.

Pumping Plants

As previously described, there would be up to two pumping plants external to the Kettleman Reservoir – the pumping plant to be constructed near the intersection of the South Fork Canal and the new Kettleman Canal as part of the larger conveyance system to move water between the canals (Kettleman Pumping Plant #1) and the pumping plant associated with the Aqueduct Intertie (Kettleman Pumping Plant #2). The Kettleman Pumping Plant #1 would be a canal relift pumping plant to be located within the Kettleman Canal channel, and would consist of a reinforced concrete structure with an operating platform, miscellaneous metalwork, and up to nine (9) low-head, high volume pumping units, discharge manifold piping and appurtenances and electrical equipment. The Kettleman Pumping Plant #2 would be a high-lift pumping plant to be located south of the Kettleman Reservoir at the intersection of the Kettleman Canal and the Aqueduct Intertie. The Kettleman Pumping Plant #2 would include a concrete intake sump structure, up to twelve (12) high-capacity vertical turbines, below-grade pump and motor units, discharge manifold piping and appurtenances, up to three large diameter steel standpipes (painted in red and white stripes and up to 140-feet tall) or up to three air chambers for hydraulic/surge control, trashracks, flowmeter vault, and electrical equipment, all within a chain-link fenced enclosure. The yard area within the enclosure would be topped with crushed rock and would be accessed via the crushed rock road atop the channel levees. Energy-efficient pumps and motors would be selected as appropriate.

In addition to these ‘external’ pumping plants, there would be up to three turn-in/turnout structures along the Kettleman Canal where it parallels the Kettleman Reservoir to convey water from the Kettleman Canal into and out of the Kettleman Reservoir for ultimate delivery to the Aqueduct Intertie. (Water to be stored in the reservoir would be pumped from the Kettleman Canal into the Kettleman Reservoir. Water to be recovered from storage would flow via gravity from the reservoir’s storage cells into the Kettleman Canal.) The three turn-in/turn-out structures would be located at the top, middle, and bottom of the west side of Kettleman Canal where it parallels Kettleman Reservoir. Additionally, there would be turnout structures

along the Blakeley Canal to facilitate gravity deliveries from the Blakeley Canal into the Kettleman Reservoir and/or the Kettleman Canal for ultimate delivery to the California Aqueduct.

2.3.4 Additional Project Features

The proposed Project would integrate additional project features to provide multiple benefits to the region and the environment. These additional features are described below.

Intermittent Aquatic and Riparian Habitat

Seasonal or intermittent shallow open-water habitat that mimics the former Tulare Lake would be provided by the approximate 10,240 acres of new shallow surface water storage facilities. These facilities would be managed to benefit migratory birds along the Pacific flyway. Resident wildlife would also benefit from the addition of temporary wetlands and shallow water habitat to the region.

Recreation

Wildlife viewing areas would be included in the Project design. The Project's wetland components are anticipated to attract waterfowl and other wetland species in large numbers, and the proposed viewing areas would provide both recreational and educational benefits. The viewing areas would be similar in design to those provided at the Kern and Pixley National Wildlife Refuges, located about 10 miles to the south and east of the proposed Project, and would be equipped with educational signage discussing the former Tulare Lake and Pacific Flyway. The viewing areas would be located near the intersection of Quebec Avenue and Highway 41, and near the intersection of Racine Avenue and Highway 41, and would be accessed from Quebec Avenue and Racine Avenue, respectively.

2.4 Construction, Operation and Implementation

2.4.1 Construction

Project facilities would be constructed using a variety of traditional construction methods and equipment. Project construction is described below by facility type.

Staging

Access to the Project area would be from Interstate 5, State Highway 41, and local and county roads in the project area. Construction of the proposed storage and conveyance facilities would require staging areas for storage of equipment and material and for vehicle parking. Staging areas would require site security and fencing.

Project staging areas and construction easements would be confined to the Project footprint to the extent feasible.

Construction Methods

Construction would involve several steps, as follows:

- Site preparation. This would involve clearing, grubbing and other site preparation activities. Structural demolition would be completed as needed. Protective fencing would be installed around the limits of construction to ensure protection of any sensitive habitat that would remain on the site. Site preparation would utilize bulldozers, motorgraders, and water trucks, among other construction equipment.
- Access improvements. Temporary construction roads would be constructed within the construction easement for site access. Water trucks, silt fencing and other construction best management practices would be implemented during construction to minimize impacts associated with these temporary access roads. Once construction is completed, the roads would be revegetated to minimize any long-term impacts resulting from their construction and use.

- Earthwork. After the sites are cleared of grasses, underbrush and trees, grading would begin. Earthwork would include site grading and levee construction to form the surface storage reservoir (including interior storage cells) and conveyance channels, plus grading required for construction of the Aqueduct Intertie, pumping plants, electric substation, and maintenance yard. The improvements are designed to provide a balance between cut and fill quantities within the construction areas, thus minimizing the need to export or import soils. Material excavated would be used to create levees and/or spread across other areas of the site to establish a preliminary grade for forming concrete slabs and foundations for permanent structures associated with the Aqueduct Intertie, pumping plants, electric substation, and maintenance yard. Following rough grading, additional excavation would bring the site to final grade and allow for preparation for the above-grade reservoir and underground piping and structural slabs for permanent structures such as transformers or buildings.
- Additional site work would include gravel paving, temporary and permanent security fencing, and site lighting.
- Electrical/Instrumentation. Electrical and instrumentation controls equipment (e.g., control consoles, switchboards, and lighting) would be installed in cabinets at various locations around the Project area. Flow meters and other instrumentation would also be installed.
- Startup and Testing. This phase of construction would involve Semitropic personnel (i.e., engineers, inspectors, operators, maintenance crews, and instrumentation specialists) working with the equipment vendors to understand how each piece of equipment would operate and function. Under Semitropic supervision, the construction contractor would start up and test the equipment on site to guarantee that pumps, motors, monitoring and communication equipment are functional and able to meet design standards.

Specific construction details by facility type are described below.

Storage Facilities

The Kettleman Reservoir would be constructed by excavating ditches of sufficient width and depth, running parallel to the embankments, to generate enough material for the compacted earthen embankments and access roads. The levees would be trapezoidal in cross-section, with a top width of approximately 14 feet, and would be constructed with on-site material. Levees to be used as access roads would be topped with aggregate base/rock material. The proposed height of the levees would vary between six to eight feet above the original grade. The side slope for the interior of the levees would be up to 6:1 on the windward side, and the side slope for the exterior of the levees would be up to 3:1. The construction method would be a "cut-and-fill" operation utilizing self-loading, rubber-tired scrapers augmented by bulldozers, front end loaders, compactors, motorized graders, water trucks, and other similar earth moving and handling equipment. Up to approximately 10,893,000 cubic yards of soils would be moved to construct the reservoir embankments. It is anticipated that all soil materials would be managed on-site, with the reservoir excavation and the levee construction being a "balanced" cut and fill operation.

Conveyance Facilities

The proposed Project includes two sets of conveyance facilities – those required to divert and convey water from the South Fork of the Kings River to the Project area, and those required to convey water to/from the Project area to the California Aqueduct. Conveyance facilities construction includes improvements to Empire Weir No. 2, improvements to the Blakeley Canal, construction of a new channel (referred to as the Kettleman Canal) between the South Fork Canal and to/through the Kettleman Reservoir, and construction of the Aqueduct Intertie. Construction of the Aqueduct Intertie would begin at Kettleman Pumping Plant #2 and continue through installation of up to three 144-inch ID pipelines from the pumping plant to the Aqueduct turn-in/turn-out structure, and construction of the turn-in/turn-out structure itself.

Planned improvements to Empire Weir No. 2 include modifications to the weir structure entering the South Fork Canal. The structure would be modified to increase the capacity of control gates to allow up to 2,200 cfs to enter the South Fork Canal. The portions of the channels leading into and from the weir may require deepening via dredging by backhoe or similar equipment to match design criteria. The control structure would be replaced using a combination of manual labor and standard construction equipment, such as cranes and winches.

Kettleman Weir would be constructed at the junction of Kettleman Canal and the South Fork Canal to include a four bay radial gate structure within the South Fork Canal, immediately downstream of the Kettleman Canal inlet from the canal, to control flows during Project operations. A canal tie-in or weir structure would be constructed at the head of the Kettleman Canal to divert floodwaters in to the Kettleman Canal.

Kettleman Pumping Plant #1 would be located approximately 5,000 feet downstream of the South Fork Canal and within the Kettleman Canal. This canal relift pumping plant would consist of a reinforced concrete structure with an operating platform, miscellaneous metalwork, and up to nine (9) low-head, high volume pumping units, discharge manifold piping and appurtenances, and electrical equipment.

The Kettleman Canal would include the construction of an earthen trapezoidal channel with a 2,100 cfs capacity connecting to the South Fork Canal approximately 3,000 feet south of Nevada Avenue. This canal would be 40-foot wide at the bottom, 15-feet deep on average (23 feet deep for the first section into Kettleman Pumping Plant #1), and constructed using a combination of cut and fill, excavating the trapezoidal channel via backhoe (or similar construction equipment) and constructing levees up to 14 feet high adjacent to the channel. Embankments adjacent to the canal would be 20 feet wide and designed to withstand truck traffic. Approximately 2,212,000 cubic yards of soil would be excavated for the canal, Kettleman Pumping Plant #1, and associated control structures; all soils would be used either at the canal site or at other locations within the Project area. Proposed improvements to the Blakeley Canal are not anticipated, except for modifications required to add three gravity-feed turnout structures to divert water into the Kettleman Reservoir when feasible.

Construction of the Aqueduct Intertie consists of three parts – construction of Kettleman Pumping Plant #2, construction of up to three 144-inch ID pipelines from the pumping plant to the Aqueduct turn-in/turn-out structure, and construction of the turn-in/turn-out structure. Kettleman Pumping Plant #2 would be constructed by first clearing, grubbing and leveling the plant site. Subsurface facilities would then be constructed using equipment such as excavators, bulldozers, compactors and front-end loaders to excavate the areas required for construction, and for backfilling and compacting over subsurface facilities once construction is complete. Surface facilities would then be constructed following subsurface facility construction, and would include placing concrete pads for the pumps, transformer and motor control cabinets, construction of the steel standpipes or air chambers for hydraulic control, and lifting the operating platform, trash racks, other miscellaneous metalworks, pumps, motors, electrical equipment, and discharge manifold piping into place with a crane. Final work would include final grading and placement of gravel surfacing with front-end loaders, graders, compactors, and skip loaders, painting of all exposed metal surfaces, and installing the perimeter fencing and gates. An estimated 46,000 cubic yards of soil would be excavated as part of the pumping plant and Aqueduct Intertie turn-in/turn-out structure construction. Some of this soil would be reused at the pumping plant location; the remaining soil would be reused else on the Project area.

Installation of up to three 144-inch ID pipelines would involve construction of the pipelines and associated pipeline appurtenances (such as control valves, air release valves, and marker posts). The pipelines would be placed either above-grade or in the subsurface with a minimum earth cover of three feet over the pipe. The construction process involves marking the limits of the rights-of-way (ROW); clearing and grubbing

the ROW; and then installing the pipelines via trenching with excavators, trenching machines and backhoes if the pipelines are installed in the subsurface. If trenching operations are required, temporary spoil piles would be formed on one side of the trench, allowing the other side of the ROW to be used for pipe hauling and delivery of pipe via flat-bed semitrailers; unloading of pipe and storage in the ROW alongside the trench using a crane; pipe laying and fitting with excavators, sidebooms or cranes; pipe zone backfill with front-end loaders, compactors and water trucks; and backfilling the trench with rubber-tired loaders, compactor or bulldozers and water trucks. If the pipelines are constructed above grade, the ROW would be used for equipment access and temporary staging. The pipeline alignment would be cleared and leveled, and pipe supports constructed at an approximately 70-foot spacing. The pipelines would have expansion joints approximately every 1,000 feet, to allow for minimal pipe movement. Regardless of how the pipelines are constructed, once installation has been completed, the ROW would be cleaned up and restored. Water trucks would be utilized, as required, to maintain dust control during construction operations. Excess trench excavation and/or grading materials would be spread within the existing work area to allow for settlement or used for construction of the storage facilities. The pipelines would be hydrostatically tested after construction and prior to Semitropic acceptance and operation of the system; test water would be obtained from local sources or the Aqueduct. Test water would be captured and delivered to Semitropic via the Aqueduct or used locally for irrigation or dust control.

Pipeline installation would require a temporary ROW width of up to 300 feet for construction and a permanent ROW width of 120 feet after construction. The full ROW width would be necessary to temporarily stockpile spoils and to have a working area to string the pipe adjacent to the final alignment and install the pipeline on the opposite side. The widths of the work areas and trenches would vary with the size of the pipeline being constructed. If the pipelines are to be installed below grade, an estimated 669,000 cubic yards of soil would be excavated as part of the pipeline construction. Regardless of pipeline installation (above- or below-grade), any soil not reused along the pipeline alignment would be reused elsewhere on the Project area.

Construction of the Aqueduct turn-in/turn-out structure along the east embankment and adjacent to the California Aqueduct would begin by installing a cofferdam along the Aqueduct east embankment to allow operations to continue during construction of the Project. Construction would then continue with excavation of the eastern Aqueduct embankment, and would require excavation of an estimated 16,300 cubic yards of soil. Some of this soil would be reused at the turn-in/turn-out location; the remaining soil would be reused elsewhere in the Project area. Following excavation, the concrete housing structure for the turn-in/turn-out gate would be formed, followed by installation of reinforcing steel and placement of concrete. The turn-in/turn-out gate structure framing and other concrete inserts would also be installed at this stage. Electrical conduits and other embedments would be installed during concrete placement as well. Pipelines would be installed into the east side of the structure through a metering vault, then to gated openings at the California Aqueduct. Compacted backfill would be placed around the structure as it is constructed, and roadways and operations and maintenance areas around the structure would be paved with asphalt concrete. A control building and liquid propane gas (LPG) fuel tank would be installed adjacent to the metering vault to house electrical components and control systems and to provide fuel to the mechanical systems.

Other Facilities

Other facilities to be constructed as part of the Project include PG&E electrical facilities, a maintenance yard, and in-reservoir pumping plants.

PG&E Electrical Facilities

The following represents an overview of construction methods most likely to be used by PG&E for construction of switchyards, substations, and overhead distribution lines.

230 kV to 115 kV Switchyard and 115 kV to 12 kV Substation

Step 1 – Site Access and Preparation: Staging areas would be constructed near the switchyard and substation sites for the staging of material and equipment and the fabrication and assembly of steel support structures appurtenant to the facilities. The sites would be cleared and grubbed from vegetation and the site graded and compacted to the final elevations.

Step 2 – Support Structure Foundations: Construction of support foundations would be required for the steel support structures necessary to support busses, circuit breakers, switches, overhead conductors, instrument transformers and the Tubular Steel Poles (TSP).

Foundations for steel support structures would include piers, spread footings, direct buried steel mat type footings, and/or other foundation types. For construction of pier foundations, activities would include augering the holes to the diameter and depths required, placement of reinforcing steel, setting forms, and placement of concrete. For spread footings, a rectangular concrete pad would be constructed and activities would include excavation of a rectangular subsurface to the depth required, placement of forms and reinforcement, and placement of concrete.

Construction of a tubular steel pole structure would include placement of the pole structure and would require the use of a large auger to dig a single large foundation hole to the diameter and depth required. A cage of reinforced steel with anchor bolts would be installed and concrete placed in the hole. The foundation concrete would be left to cure and forms removed and the ground restored around the foundations.

Step 3 – Erection of Support Structures: Erection of the new supporting structures (steel members) would be accomplished in sections, and supported by the foundations. The activities would include delivery of support structure components to the staging areas and the installation site. Support structure towers would be assembled at the staging areas or adjacent to the foundation sites and raised in place with a large crane. A smaller crane would be used to assemble support structure components and to lift heavy steel members in place. For erection of the TSP, the TSP would be delivered in components and assembled near the foundation site. The components would be pulled together with a winch and cross arms bolted to the pole. Insulators would be attached and secured to the cross arms. A large crane would be used to erect and set the TSP over the anchor bolts embedded in the concrete foundation, and the nuts on the foundation tightened.

Step 4 – String Conductors: Activities would include installation of insulators to the ends of structure cross arms and puling conductors to the final tension position.

Step 5 – Construction of Equipment Concrete Pads: All switchyard and substation electrical equipment outlined above in Section 2.4.3 would require the construction of concrete foundations. Activities would include excavation of the subsurface to the dimensions and depth required, placement of forms and reinforcement, and placement of concrete.

Step 6 – Installation of Electrical Equipment: Once concrete foundations have been constructed, all pertinent electrical equipment, as outlined in Section 2.4.3 above, would be delivered to the project site via

flatbed trucks and lifted by a crane for ultimate placement over the concrete pads. The electrical equipment would be set and either be bolted or welded to meet the applicable seismic requirements.

Step 7 – Final Cleanup: Once all facilities inside the switchyard and substation have been constructed as described above, the sites would be overlaid with crushed rock and a chain-link fence would be erected for site security.

12 kV Distribution Line

Placement of wood poles for the 12-kV distribution line would require the use of an auger to dig the hole to the diameter and depth required for the erection of the powerpoles. Poles, conductors, and accessories would be delivered via a semi-trailer flatbed. The cross arms and insulators would be bolted to the wood poles and the assembly completed on the ground. The assembled poles would be lifted with a line truck, set in the hole, and then backfilled with native material. Once the poles are set in place, the cable would be installed and be fed through the stringing sheaves at the end of each insulator, tensioned and strung to the other end.

Maintenance Yard

The yard would be located near the Aqueduct pumping plant (Kettleman Pumping Plant #2) and would be accessed via the same crushed rock road along top of the channel berm leading from the Kettleman Reservoir to Kettleman Pumping Plant #2. The maintenance yard would be approximately 260 feet by 500 feet in size, and would be surrounded by a chain-link fence with onsigate. The yard would contain two permanent pre-fabricated metal buildings, a substation control building, and a maintenance warehouse. No permanent water or sanitary systems would be located at the yard. Security cameras and lighting would be installed at the substation and maintenance yard location for security monitoring and nighttime access. The substation and maintenance yards would then be surrounded by a chain-link fence with gate, and the interior covered with crushed rock to create a drivable surface.

Pumping Plants

Up to five pumping plants, in addition to the Kettleman Pumping Plants #1 and #2, would be constructed within the Kettleman Reservoir. Each pumping plant would be located at the terminus of a pipeline used to fill and drain the storage cells within the reservoir. The pumping plants would be located at top of the interior levees of the reservoir and would consist generally of a gate to control flow into/out of the pipeline and a pump mounted atop the levee on a concrete foundation. Pumping plants would be accessed via crushed rock maintenance roads constructed on top of the interior levees.

Construction Equipment

Construction of the proposed Project would require heavy equipment on site at all facility sites. The final equipment requirements would be determined by the construction contractor, but may include the following:

- Back hoes
- Front-end loaders
- 10-wheel dump trucks
- Cranes
- Compactors
- Flat-back delivery trucks
- Earth movers
- Bull dozers
- Excavators
- Water trucks
- Concrete trucks
- Motor Loaders
- Scrapers
- Trenching Machines
- Line trucks
- Bucket trucks
- Pile drivers
- Drilling rigs

Additional specialized construction equipment may also be required.

Schedule

The proposed Project is expected to be constructed over a period of three to five years. Typical construction work hours would be Monday through Friday from 7:00 AM to 6:00 PM, but construction may take place during weekends if necessary. Nighttime construction activities (10:00 PM to 7:00 AM) are not anticipated. Noise associated with construction activities is considered temporary, but would adhere to applicable Kings County Noise Element standards.

2.4.2 Operations and Maintenance

In general, the proposed Project is expected to operate when Kings River flows are or would be available at the James Bypass. Based on historical records, this occurs, on average, three out of every 10 years. During years when flood water is available, flows would be diverted southward into the South Fork of the Kings River at Army and Crescent Bypass Weirs. From there, the floodwaters would flow south, down the South Fork of the Kings River, to Empire Weir No. 2 where the water would then be diverted into the South Fork Canal. Floodwaters would then be conveyed via the South Fork Canal and the new Kettleman Canal (and possibly other conveyance facilities such as the Blakeley Canal) to and through the surface storage reservoir to the California Aqueduct. This would continue as long as there is capacity in the Aqueduct to receive and convey the flows south to Semitropic's existing banking or other storage facilities or to meet irrigation demands. When there is limited capacity in the Aqueduct and/or limitation due to insufficient storage capacity or irrigation demands the flows would be diverted into storage cells in the Kettleman Reservoir for storage. Once capacity in the California Aqueduct is available, the stored water would be pumped back into the Aqueduct via the new intertie facilities for conveyance to Semitropic's existing banking or other storage facilities or to meet irrigation demands. During years when the reservoir is empty, dry grazing or other agricultural operations would be allowed to continue in the facilities.

Operations

Flood Flow Diversion and Management

Flows on the Kings River were evaluated over a period extending from 1977 to 2016. Based on the Project's proposed operations, as described above, floodwaters were assumed to be available for use by the Project whenever Kings River flows would have otherwise been diverted to the James Bypass (and from there, to the San Joaquin River). This was assumed, based on past flow operations, to occur whenever flows exceeded 100 cfs at James Bypass. Assuming these criteria, floodwaters would be available for diversion by the Project approximately 15 times in a 40-year period, or approximately three in every ten years, for periods lasting from 15 to 140 days (**Figure 2-6**).

Under the proposed Project, excess wet-year and flood flows would be diverted southward into the South Fork of the Kings River at Army and Crescent Bypass Weirs (**Figure 2-7**). From there, the floodwaters would flow south, down the South Fork of the Kings River, to Empire Weir No. 2 where the water would then be diverted into the South Fork Canal. Floodwaters would then be conveyed via the South Fork Canal and the new Kettleman Canal (and possibly other conveyance facilities such as the Blakeley Canal) to and through the surface storage reservoir to the California Aqueduct for ultimate delivery to Semitropic's existing banking or other storage facilities or to meet irrigation demands. At any time, the maximum diversion rate would be 2,100 cfs through the Kettleman Canal and 100 cfs through the Blakeley Canal.

In addition to the Kings River floodwaters, the Project could divert and utilize nuisance floodwaters that occur in the base of the Tulare Lake Bed. Gate structures at the Empire Weir and the Kettleman Canal would be controlled remotely by Semitropic with a manual override at the site to divert these waters into the Project area. When this localized nuisance flooding occurs, temporary pumps would be used to pump

the pooled water into the South Fork Canal for conveyance and use as described above. These floodwaters are anticipated to occur on approximately the same frequency as the Kings River floodwaters diversion, and are the result of localized stormwater and snowmelt runoff that gets trapped in the lake bed, flooding agricultural lands, and which would otherwise dissipate via evaporation.

Floodwater Conveyance and Reservoir Management

Floodwater flows from the South Fork of the Kings River, diverted into the South Fork Canal, would be conveyed south and westward towards the surface storage reservoir via the South Fork Canal, diverted through the Kettleman Weir, and subsequently conveyed through the new Kettleman Canal. The first flows into the Kettleman Canal would bypass storage in the reservoir and continue to the Aqueduct Intertie to the California Aqueduct at an estimated flow rate of 2,100 cfs. As previously noted, this would continue until there is no additional capacity in the Aqueduct to receive the water and/or for downstream uses (including banking). If no capacity is available in the Aqueduct for conveyance and/or no downstream uses are identified, the conveyed floodwaters would be directed into the Kettleman Reservoir for storage. Water would be lifted from the Kettleman Canal to the storage cells via pumping plants to fill the lower and upper cells of the Kettleman Reservoir and/or conveyed via the Blakeley Canal and gravity fed into the Kettleman Reservoir.

Waters stored in the Kettleman Reservoir would ultimately be conveyed to the California Aqueduct, principally for direct delivery or by exchange to Semitropic and/or other landowners in Kern County with direct irrigation demands and/or for storage in available facilities (described above), including the Semitropic Groundwater Bank. Stored water in the Kettleman Reservoir would flow by gravity from the upper cells to the lower cells, and from there into the Kettleman Canal. From the Kettleman Canal, the water would be lifted by the Kettleman Pumping Plant #2 and conveyed in the Aqueduct Intertie to the turn-in/turn-out structure for ultimate delivery to the Aqueduct.

In general, as part of this project, the California Aqueduct would be used to convey stored wet-weather flows. Pumping plants and pipelines would be operated up to 24 hours per day to deliver water to Semitropic. Non-project water conveyed in the California Aqueduct is on a "space-available" basis; availability of space is determined by DWR and is based on either physical or operational constraints.

SWP Water Diversion and Management

During periods when excess SWP water is available for banking (e.g., SWP entitlements exceed the consumptive needs of Semitropic's landowners' irrigation demands), and Semitropic capacity for managing these flows in banking and other facilities is limited, the Project may be used to temporarily hold excess SWP water until capacity is available. Under this scenario, water would be diverted from the California Aqueduct via the Project's new turn-in/turn-out structure and conveyed via gravity to the Kettleman Canal. From there, the water would be lifted via pumping plants to fill the storage cells in the Kettleman Reservoir. As with floodwaters from the South Fork of the Kings River, SWP water stored in the Kettleman Reservoir would flow by gravity from the upper cells to the lower cells and then be conveyed to the Kettleman Canal by gravity to the Kettleman Pumping Plant #2 where it would ultimately be pumped and conveyed back to the Aqueduct for transmission downstream for direct use and/or storage.

The Project would be operated by Semitropic consistent with existing operations (such as those associated with the Semitropic Groundwater Bank) and applicable commitments, including environmental documentation and associated mitigation measures. Project operations, anticipated to occur on average three out of ten years, would have an estimated energy demand of as much as 48 megawatts (MW) of electricity.

Figure 2-6: Kings River Historic Yields

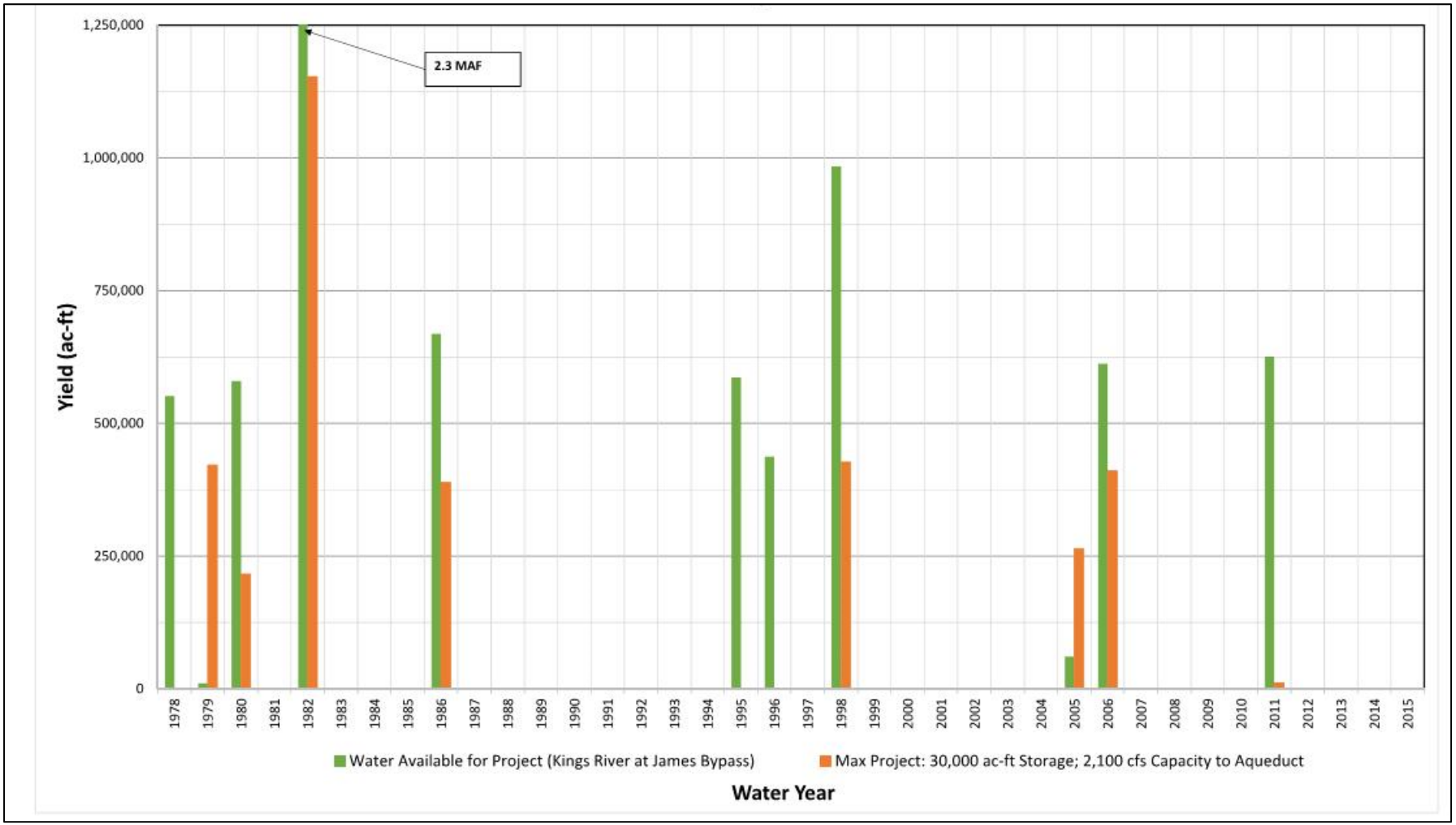
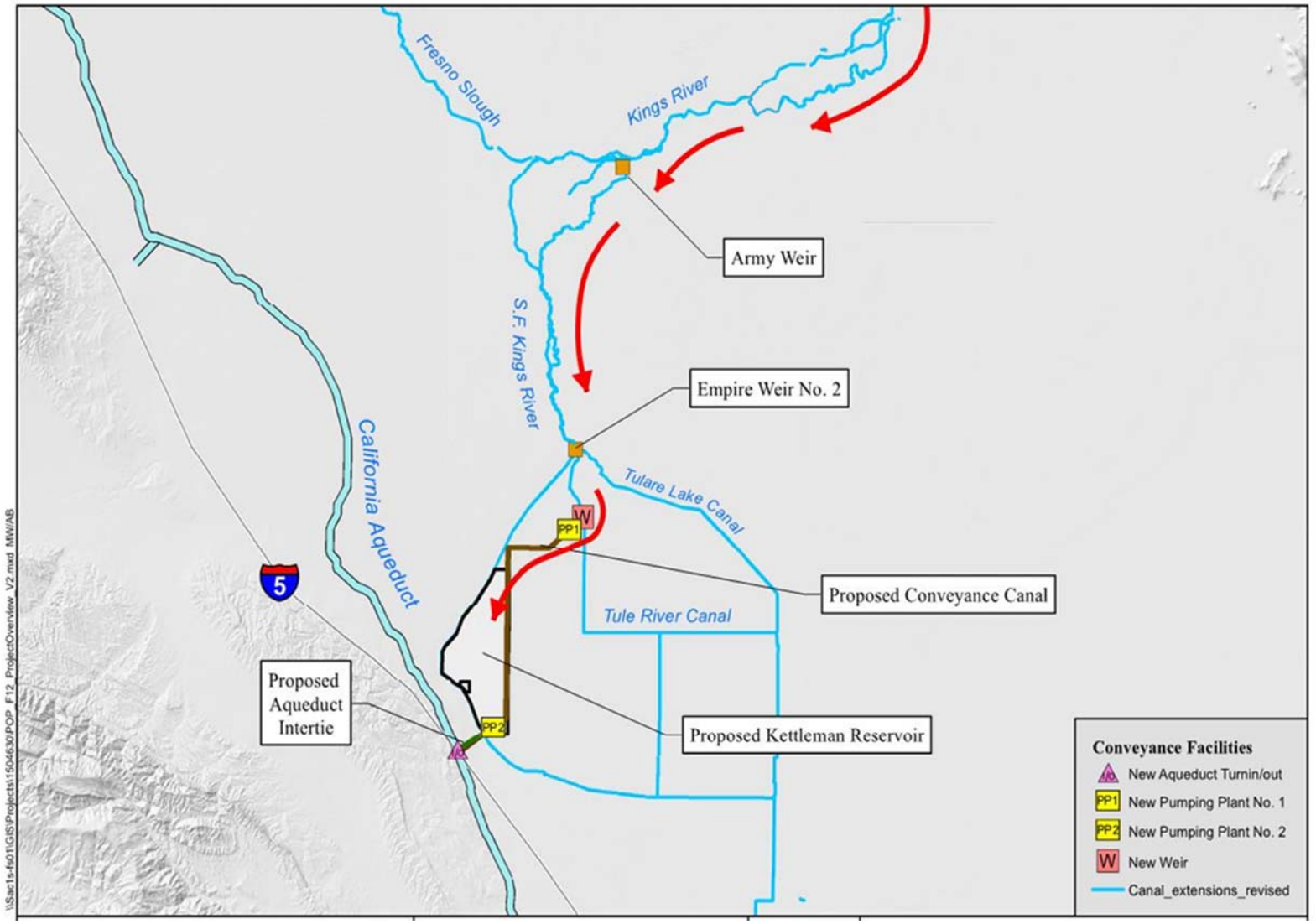


Figure 2-7: Kings River Diversions to South Fork



Maintenance

Maintenance of the Project would primarily involve regular inspections by field staff of the pipelines, canals, pumping plants, and levee impoundments, predominantly at times when the Project is in operation. It is expected that the equivalent of four full-time staff would be required to operate and maintain the facilities. No changes to Semitropic's internal, administrative water allocation system would occur. Semitropic would work directly with the DWR to track water inputs and outputs of the California Aqueduct.

Below is a description of maintenance activities for each facility type.

Storage Facilities.

The storage reservoir would be subject to frequent visual inspections and patrols when in operation. Access to the site would include driving along the operating roads, and on-site access would involve driving along the top and/or outside toe of the reservoir embankments. General maintenance activities would include the following:

- Regular inspection of levees and conveyance structures;
- Periodic grading of the tops of the reservoir embankments as well as dike access roads to facilitate vehicular travel;
- Grading of reservoir embankment slopes to control vegetation and repair damage from burrowing animal activity;
- Rodent control;
- Periodic inspection and repair of the riprap around the entrance/exit control structures;
- Weed abatement on reservoir embankments and reservoir bottom, including mowing, grading, and treatment with herbicides; and
- Periodic silt removal and regrading of the reservoir bottom, with removed material applied to the reservoir embankments.

Conveyance Facilities.

The pipelines and canals would require periodic visual inspection, when in operation, which would involve driving along the alignment and observing the ground surface over the pipeline and making note of any settlement, unusual cracks in the earth, or leakage. Aside from these inspections, routine maintenance activities would be minimal. From time to time, it may be necessary to drain the pipeline to facilitate inspection and/or repairs. If a leak is detected, the nature of the leak would dictate the extent of the repair. Internal repairs would require draining the pipeline and uncovering one or more manholes for access to the inside of the pipeline. External repairs may or may not require draining the pipeline, but would require excavation of the pipeline in the vicinity of the leak. This effort would require equipment and disturbance similar to that required to construct the pipeline, though it would be localized to the area of the leak.

Pumping Plants.

All pumping plants would be subject to periodic visual inspections and patrols, when in operation, with access generally provided by driving the adjacent operating roads. When not in use, the pumps would be exercised for short periods (as necessary) each year to ensure operational readiness. Maintenance activities would include the following:

- Lubrication of pumps, motors, and control valves, with cleaning, testing, and replacement of electrical components as required;

- Removal of accumulated debris from trash rack(s), stacking debris for drying, and disposal of debris after drying;
- Weed abatement around pumping plant sites, including mowing, grading, and spot treatment with herbicides;
- Washing pump head and base plate, manifold piping, and all other aboveground facilities as necessary;
- Painting of all metal surfaces including pumps, motors, and exposed piping and appurtenances from time to time to avoid corrosion and for aesthetic purposes;
- Removal of accumulated sediment from the pump sump;
- Replenishment of gravel surfacing around plant sites; and
- Repair or replacement of pumps, motors, valves, and electrical equipment.

PG&E Electrical Facilities

General maintenance activities would include the following:

- Inspection of steel structures for detection of corrosion or misalignment;
- Inspection of hardware, insulators and conductors, for any corrosion, breaks, broken equipment, and failing splices;
- Replenishment and filtration of transformer oil; and
- Substation/switchyard monitoring via the connected PG&E computer system by a telecommunication circuit.

The Project's electric power distribution system would also require periodic maintenance; such maintenance may include repair and replacement of power lines, wooden power poles, and conduit (e.g., as a result of failures and storm damage). Additionally, an area of up to 10-foot radius around the base of the poles would be maintained free of vegetation with the use of herbicides and mowers.

Existing Semitropic operations and maintenance staff would conduct maintenance activities. Staff would drive to the pumping plants and pump stations, pipelines, canals, and levees for regular inspections.

2.4.3 Implementation - Water Rights, Institutional Agreements

Project implementation may require securing water rights or agreements for use of flood flows from the Kings River and additional institutional agreements with others, including landowners and operators of river point-of-diversion facilities. In this regard, Semitropic has filed with the SWRCB an Application to Appropriate up to 2,200 cfs and 1,600,000 acre-feet of Kings River water for direct diversion and storage (including underground), along with an associated petition to remove the Kings River system from the SWRCB's fully appropriated stream declaration. The proposed Project would yield between approximately 81,000 and 120,000 AFY average annual of Kings River floodwater.

SWP water would be diverted from the California Aqueduct and held temporarily in the new surface storage reservoir for return to the Aqueduct would require approval of applicable SWP contractors in accordance with Article 56 of the SWP long-term water supply contracts. Any use of the Project for storage of SWP water, other than Semitropic-contracted SWP water or water belonging to Semitropic banking partners, would be subject to further CEQA analysis, as appropriate. Agreements would also be needed from DWR for construction and operation of the turn-in/turn-out structure and conveyance of water in the Aqueduct. Turn-in/turn-out agreements are already in place for all places of diverion or rediversion in Kern County

and Kings County, south of the Project area. SWP contractors have the right to convey non-project water through the Aqueduct for delivery to their service areas and to interim storage outside their service areas subject to applicable provisions of the long-term water supply contracts including Article 55. KCWA routinely makes requests for conveyance of non-project water through the Aqueduct on behalf its Member Units and could do so on behalf of Semitropic as necessary. Typically a Non-Project (NP) pump-in proposal (PIP) would be submitted to the DWR for approval before water is conveyed through the Aqueduct. Any exchanges of Kings River water with SWP water within the places of use in Kern County or Kings County may require approvals from KCWA or Dudley Ridge, as applicable.

Finally, as a part of the agreement with the existing landowner where the Project would be constructed, a portion of the water from the Project could be delivered and stored in the landowner's account in the SWRU of the Semitropic Groundwater Bank for use by the landowner, subject to the conditions of the landowner's banking contract. Any transfer of project water on behalf of the landowner for storage or use on lands outside of Semitropic's boundaries is the sole responsibility of the landowner, speculative and subject to further CEQA analysis, as appropriate.

Chapter 3 Environmental Analysis

3.1 Introduction to Environmental Analysis

In compliance with CEQA Guidelines Section 15125 and 151236, Chapter 3 of this Draft EIR presents an assessment of the environmental effects of the proposed Project with respect to existing baseline conditions and includes a description of the existing physical environment of the Project area. Baseline conditions are considered to be from the time the Notice of Preparation was published. The following environmental resource topics are assessed in this chapter in accordance with Appendices F and G of the CEQA Guidelines:

- Aesthetics
- Agriculture and Forestry Resources
- Air Quality
- Biological resources
- Cultural Resources
- Geology, Soils, and Seismicity
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Noise
- Oil, Gas and Mineral Resources
- Population and Housing
- Public Services
- Recreation
- Transportation and Traffic
- Utilities and Energy

Each environmental resource topic that follows contains a description of:

1. The environmental setting as it relates to the specific resource topic;
2. The regulatory framework governing that resource topic;
3. The methodology used in identifying potential environmental impacts;
4. The criteria used to determine the significance level of environmental impacts;
5. An evaluation of the program and project-specific impacts and identification of mitigation measures; and
6. A determination of the level of significance after mitigation measures, if appropriate, are implemented.

For the purposes of this impact analysis, the term 'Project Area' is used to describe the properties and/or easements acquired by Semitropic on which Project-related construction and/or operations would occur. The term 'Study Area' is used for those resource topics where a larger, broader evaluation is required to perform the necessary evaluation (e.g. for assessment of potential impacts to biological and cultural resources). **Figure 3.1-1** shows the delineations of both the Project Area and the Study Area as evaluated in this chapter.

Figure 3.1-1: Project Area and Study Area Delineation



During analyses of potential environmental impacts, the following elements of the Project were evaluated for their potential to result in changes to resource areas:

- Construction activities, including ground disturbance, grading and excavation, vegetation removal, trench excavation, tunneling, and surface restoration associated with construction of the Project.
- Operation and maintenance of the diversion, storage, conveyance, and other Project facilities.

3.1.1 Determination of Impact Significance

Determining the severity of project impacts is fundamental to achieving the objectives of CEQA. According to the CEQA Guidelines Section 15382, a 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…" The study area for each environmental resource topic includes the Project site, plus any additional adjacent locations adjacent that could be affected by the Project. Depending on the resource area, the study area could be fairly broad (for example, effects on the entire San Joaquin Valley Air Basin evaluated in the air quality analysis) or impacts could be largely confined to the Project area (for example, potential to disrupt cultural resources). For each category of physical condition evaluated in this Draft EIR, thresholds of significance have been developed to determine level of environmental impact by using: (1) criteria discussed in the CEQA Guidelines; (2) criteria based on factual or scientific information; (3) criteria based on regulatory standards of local, state, and/or federal agencies; and/or (4) criteria based on goals, objectives, and policies identified in applicable city, county, and regional plans.

Each impact assessment in the Draft EIR concludes with a finding of significance based on a comparison of the evaluated impacts with the stated significance criteria to comply with CEQA. For all impacts that are identified as significant pursuant to CEQA, and where mitigation is possible and feasible, appropriate mitigation measures have been identified to reduce the impacts to a less-than-significant level. Where implementation of more than one mitigation measure is needed to reduce an impact below a threshold of significance, all of the measures are described. Mitigation measures were formulated consistent with the strategy as set forth in the CEQA Guidelines Section 15370 as follows:

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the impacted environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensation for the impact by replacing or providing substitute resources or environments.

Finally, for all significant impacts, the significance of each impact after implementation of the mitigation measure is assessed.

Terminology Used in the EIR

This Draft EIR uses the following terminology to describe environmental effects of the project:

- **Significance Criteria**. A set of criteria used by the Lead Agency to determine at what level or "threshold" an impact would be considered significant. Significance criteria used in this Draft EIR include some that are set forth in the CEQA Guidelines, or can be discerned from the CEQA Guidelines; criteria based on factual or scientific information; criteria based on regulatory

standards of local, state, and federal agencies; and criteria based on goals and policies identified in and requirements established by Kings County and Kettleman City.

- **Less-than-Significant Impact**. A project impact is considered less than significant when it does not reach the threshold of significance and would therefore cause no substantial change in the environment. No mitigation is required for less-than-significant impacts.
- **Potentially Significant Impact**. A potentially significant impact is an environmental effect that may reach the level of significance identified in the Draft EIR; however, additional information is needed regarding the extent of the impact to make the determination of significance. For CEQA purposes, a potentially significant impact is treated as if it were a significant impact.
- **Significant Impact**. Significant impacts are identified by the evaluation of project effects against the significance criteria identified in the Draft EIR. A project impact is considered significant if it reaches the level of significance identified in the Draft EIR; mitigation measures and/or project alternatives are identified to reduce these effects to the environment.
- **Significant Unavoidable Impact**. A project impact is considered significant and unavoidable if it is significant, but cannot be avoided or mitigated to a less-than-significant level if the project is implemented.
- **Cumulative Significant Impact**. A cumulative impact can result when a change in the environment results from the incremental impact of a project when added to other related past, present, or reasonably foreseeable future projects. Significant cumulative impacts may result from individually minor but collectively significant projects.

3.1.2 Cumulative Impacts

Section 15130 of the State CEQA Guidelines stipulates that EIRs must consider the significant environmental effects of a proposed project as well as cumulative impacts. A cumulative impact is defined as an impact that is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts (State CEQA Guidelines Section 15355). As stated in the State CEQA Guidelines Section 15130(a), an EIR shall discuss the cumulative impacts of a project when the project's incremental effect is "cumulatively considerable," as defined by CEQA Guidelines Section 15065(a)(3) to mean "the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects." Additionally, per CEQA Guidelines, where a lead agency is examining a project with an incremental effect that is not cumulatively considerable, the agency need not consider the effect significant but shall briefly describe its basis for concluding that the incremental effect is not cumulatively considerable. CEQA Guidelines Section 15130(a)(1) states that the cumulative impacts discussion in an EIR need not discuss impacts that do not result in part from the project evaluated in the EIR. Cumulative impacts may be analyzed by considering a list of past, present, and probable future projects producing related or cumulative impacts [State CEQA Guidelines Section 15130(b)(1)(A)].

Projects recently approved, under construction, and probable future projects that could reasonably foreseeably produce a cumulative impact on the local environment when considered in combination with the proposed project are considered in the EIR. These projects include projects outside of the control of the lead agency. If a concise list of related projects is not available, cumulative impacts may be analyzed using the regional or area-wide growth projections contained in an adopted or certified general plan or related planning document.

In this Draft EIR, cumulative impact analyses are provided for each environmental issue discussed in Chapter 3 (Environmental Analysis), and can be found in each respective subsection (e.g., air quality,

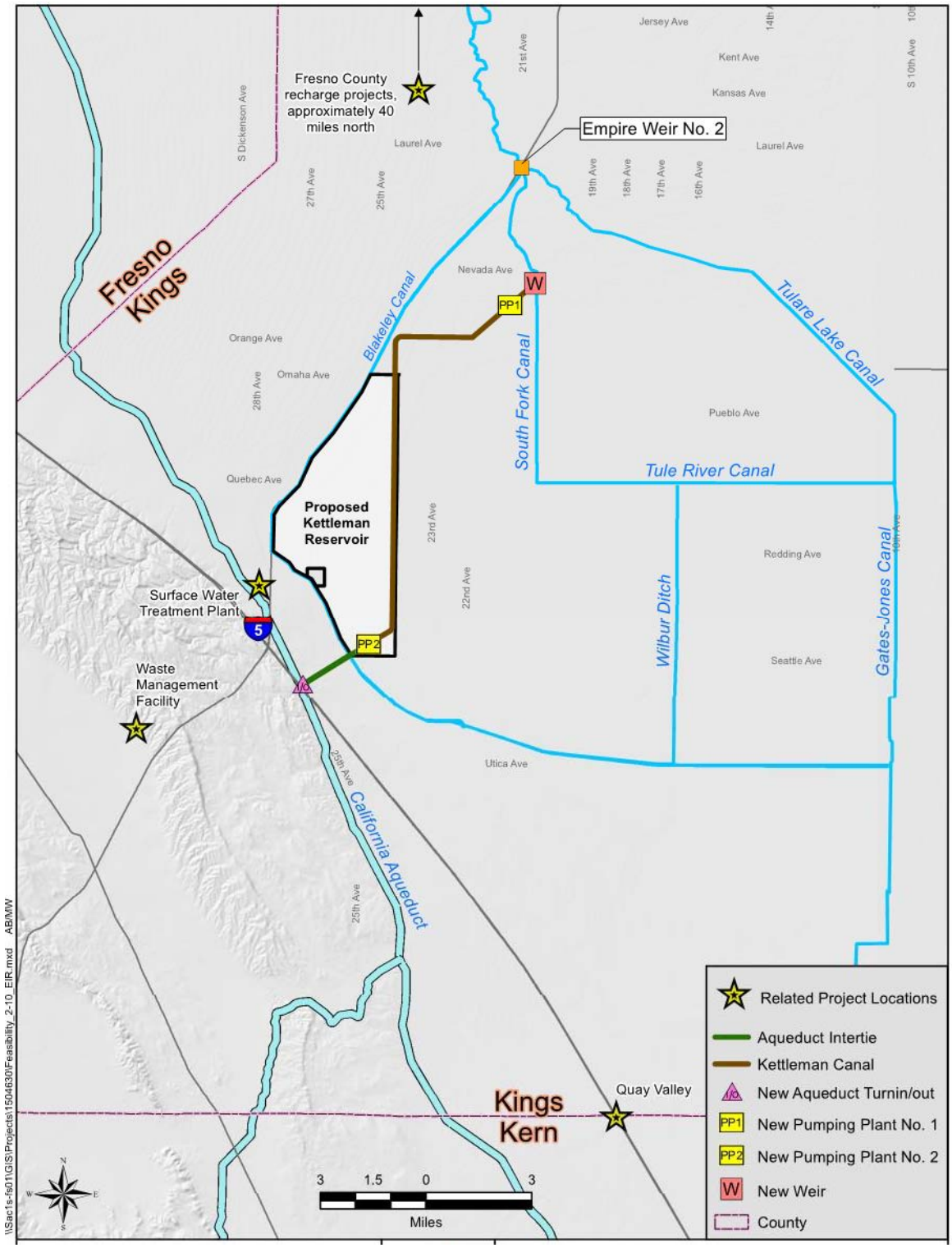
transportation, etc.). **Table 3.1-1**, Related Projects List, lists the related projects that were considered in each cumulative impact analysis. This list was developed through information obtained on various websites and through the State Clearinghouse. The locations of the related projects are depicted in **Figure 3.1-2**.

Table 3.1-1: List of Related Projects

Project Name	Address	Status	Distance from Project	General Description	Size
Quay Valley Community	Southern border of Kings County, along both sides of Interstate 5	In planning	Approximately 2 miles from the Project	New community application, 80-85K residents (26,000 dwelling units)	7,175 acres
Chemical Waste Management - Kettleman Hills Facility Expansion	35251 Old Skyline Rd., Kettleman City, CA	Application approved; project does not yet appear to be under construction	Approximately 4 miles west of the Project	A lateral and vertical expansion of the existing B-18 Landfill to provide an additional 4.6 million cubic yards (cy) of waste disposal capacity for hazardous waste and designated waste disposal	8 acres
Kettleman City CSD – Kettleman City Surface Water Treatment Plant	110 General Petroleum Ave, Kettleman City, CA 93239	In planning; Drinking Water SRF application in process	Less than 1 mile west of the Project	New surface water treatment plant treating water delivered via the California Aqueduct	
Southwest Groundwater Banking Project	Fresno County	In planning	Approximately 40 miles north of the Project	New 60-acre groundwater recharge basin plus improvements to an existing 60-acre basin and conveyance facilities	120 acres

Project Name	Address	Status	Distance from Project	General Description	Size
JID Distributed Recharge Bypass and Lassen Projects	Fresno County, Northeast of and adjacent to the JID Main Canal and along Lassen Avenue	In planning	Approximately 45 miles north of the Project	Widening and enlargement of existing recharge basins, construction of four recharge cells in non-irrigated pasture, plus construction of siphons and pump stations to divert and recharge water from James Bypass	153 acres
Terranova On-Farm Flood Capture and McMullin Recharge Site	Fresno County, Near James Bypass upstream of James Weir	In planning; pilot study complete	Approximately 40 miles north of the Project	Construction of facilities to allow on-farm flooding of 5,000 acres for diversion of water from James Bypass for managed recharge	5,000 acres

Figure 3.1-2: Related Projects



In addition to the projects listed in **Table 3.1-1**, above, a second water rights application was filed in the same period as Semitropic's water right application for seasonal water from the Kings River and associated petition to remove the Kings River system from the SWRCB's fully appropriated stream declaration and after the Notice of Preparation published for this Draft EIR. This second application was filed jointly by Consolidated Irrigation District, Fresno Irrigation District, and Alta Irrigation District, and is seeking rights to 500,000 AFY of direct diversion of Kings River flows at rates of up to 4,500 cfs, and diversion of up to 1,000,000 AFY of water to storage. Additionally, filed at the same time as the Consolidated/Fresno/Alta application, the Kings River Water Association (KRWA) filed a petition to change the points of diversion, points of rediversion, place of use and purpose of use and distribution of storage of Kings River water to "…adjusts the various Points of Diversion, Points of Rediversion, Place of Use, Purpose of Use and Distribution of Storage…to match those already existing in KRWA Application 360/Permit 15714/License 11518."

Per the Consolidated/Fresno/Alta application, there are 15 projects identified which, together, would use the 4,500 cfs would be diverted; 10 of these projects are labeled as existing projects and/or diversions, and seven are proposed projects. (Note, two of the listed projects currently exist, but are planning to expand and would therefore require construction and shown in the application as both existing and proposed). Additionally, of these 15 projects, 12 are projects requiring infrastructure and three are in-lieu recharge projects (one existing and two proposed). Based on limited publicly available information, all projects identified in the Consolidated/Fresno/Alta application would divert flood water from the James Bypass, and all are located north of the proposed Project.

Publicly available information was obtained for two of the projects identified in the Consolidated/Fresno/Alta application (information was searched for all listed projects but none found available on public websites). Specifically, a Draft Finding of No Significant Impact (FONSI-08-081) was obtained for the James Irrigation District's (JID) Water Banking Expansion Project, and an on-line article was found for the Terranova On-Farm Flood Capture and McMullin Recharge Site (USBR, 2015). Per the Consolidated/Fresno/Alta application, these two projects would divert 200 cfs and 500 cfs of Kings River flood waters, respectively, from the James Bypass. No information was readily obtainable for the remaining projects in the application list.

The JID Water Banking Expansion Project would modify and expand existing regulation/recharge basins within the James Bypass/Fresno Slough bypass, northeast and adjacent to the JID Main Canal. Specifically, this project would widen one existing recharge basin and further excavate a second to increase groundwater recharge capacity, plus construct four recharges cells in non-irrigated pasture northwest and adjacent to one of the existing basins. Additionally, the project would construct pump structures, and two 60-inch diameter concrete pipeline siphons underneath the Main Canal. This project, combined with the JID Lassen Avenue project which would construct permanent and/or temporary facilities to allow landowners to remove flood and excess waters from the JID canal along Lassen Avenue, would result in the diversion of 200 cfs from the James Bypass.

The Terranova On-Farm Flood Capture and McMullin Recharge Site project would construct facilities to allow the diversion of up to 500 cfs of flood water from the James Bypass for managed recharge on up to 5,000 acres of land across 16,000 acres of farmland for recharge.

As indicated in **Table 3.1-1**, the six future projects could potentially contribute to cumulative impacts when considered together with the proposed Project. The four projects not included in the Consolidated/Fresno/Alta water rights application are described below:

Quay Valley Community

The development of the community of Quay Valley is designed to establish a new 7,175-acre community in the southern region of Kings County, along both sides of Interstate 5. Quay Valley is proposed to be a self-sustaining community, utilizing solar power to supply community developments and emphasizing efficient and "smart" technologies. This project is expected to establish an entirely new community with urban type land uses, infrastructure and services, including:

- Residential villages to house 80,000 – 85,000 permanent residents
- A 1,900-acre family-oriented commercial entertainment destination that includes retail, themed resort hotels, an action sports complex, and tourist destinations
- Commercial land uses, such as a town center, commercial areas, office and university research park, medical center, and industrial/manufacturing spaces
- A six-acre civic center
- School facilities, totaling 16 elementary schools, two middle schools, and two high schools,
- Over 400 acres of permanent agriculture
- Reserved petroleum producing areas
- 130 acres of open space, greenways, and active recreation areas

Land use in the future Quay Valley area currently consists of fallow agriculture, and parts of neighboring properties are periodically flooded during wet years to provide for water storage. The development of the Quay Valley community is expected to occur in at least six phases; one phase for infrastructure and another five for public facilities. Phase I is expected to commence in 2017, and includes the construction of the "backbone" streets and infrastructure of the community to improve all road segments and intersections that would be affected by trips to and within Quay Valley.

The implementation schedule for future phases has not yet been determined, but would be included in the final Public Facilities Master Plan, expected to be submitted later in the project review process. Currently, GROW Holdings, LLC. (Project developer) is identifying backbone streets, infrastructure, and public facilities determined in the Development Application process, and public comments on the Preliminary Design Plan were provided to the Kings County Community Development Agency on May 25, 2016 (GROW, 2016).

Kettleman Hills Facility Expansion

The expansion of the Kettleman Hills Facility (KHF) is expected to provide an additional 4.6 million cubic yards cy of waste disposal capacity for hazardous waste and designated waste disposal, through lateral and vertical expansion of the existing facility (CH2M Hill, 2008). The Department of Toxic Substances Control (DTSC) has finalized a permit that would allow Chemical Waste Management Inc. to expand the existing KHF capacity, increasing the KHF capacity to 15 million cubic yards by adding approximately 221.5 acres to the KHF's existing permitted operations area. Currently, the KHF is one of only two hazardous waste landfills operating in California. The landfill is located west of Kettleman City, west of Interstate 5, at 35251 Old Skyline Road. The project would extend the number of years that hazardous waste could be disposed of at the KHF (through 2042) by expanding the existing B-18 Landfill and constructing a new B-20 Landfill. The existing B-18 Landfill is expected to be expanded vertically and laterally throughout two phases, beginning in 2009; however, a series of appeals and lawsuits filed against the SEIR delayed the initiation and construction of this project. In October 2012, the California Supreme Court denied further reviews of the Final SEIR, thereby approving it. Development of the new B-20 Landfill is expected to be constructed in three phases, with the first phase commencing in 2017, and is expected to provide waste disposal operations through 2042 (CH2M Hill, 2008).

Kettleman City Surface Water Treatment Plant and Commercial Water Storage Tanks

The Kettleman City Surface Water Treatment Plant and Commercial Water Storage Tanks includes construction of a new surface water treatment plant to provide a new municipal drinking water supply. The treatment plant is to be constructed at 110 General Petroleum Avenue in Kettleman City, and would provide treatment of surface water to provide potable water for community residents and businesses. The treatment plant would be constructed in two phases, the first being the construction of the water treatment plant that would treat water from the California Aqueduct, and the second being the construction of the commercial storage tank facility. An Initial Study/mitigated negative declaration was prepared for the project and approved in 2012 (Kings County, 2012); and bids were solicited for construction in May of 2017. Construction of the treatment plant is expected to take at least 18 months and could be completed as early as 2020.

Southwest Groundwater Banking Project

The Southwest Groundwater Banking Project is being proposed by Fresno Irrigation District (FID) and James Irrigation District (JID). This water banking project in Fresno County has been approved, but not yet constructed, and would include a new 60-acre groundwater banking operation adjacent to an existing FID 60-acre recharge basin site. The project is designed to divert and store approximately 5,500 AFY of water from the Kings River along with local stormwater that is routed into FID's system upstream as part of an agreement to route urban and eastside stream flows through the urban areas (Provost & Prichard, 2013). The Kings River flows would be diverted at FID's existing diversion points along the Kings River, downstream of Pine Flat Dam. The project would also improve the Lower Dry Creek canal system, including replacing a culvert crossing at Lincoln Avenue, installing two culvert crossings downstream of the new recharge basin, and widening or deepening the canal, if needed. The new water recharge basin is anticipated to have a regulation structure and up to four distribution structures so that water can be moved between potential cells within the basin. The project would utilize existing wells to provide an annual average water supply of 5,500 acre feet AF to FID or JID users, and provide approximately 270 AF of flood water surface storage in the recharge basins (Provost & Prichard, 2013). If necessary, three shallow monitoring wells would be constructed to help monitor and manage the facility. Floodwater and other available surface waters would be delivered to the new basin and recharged into the aquifer. The banked water would later be extracted using existing wells and delivered to FID or JID.

3.2 Aesthetics

This section evaluates the potential impacts on aesthetic and visual resources associated with construction and implementation of the proposed Project, including the storage facilities, diversion and conveyance facilities, and other facilities. For the purposes of this analysis, aesthetic resources are defined as the visible natural and built landscape features that surround the Project area. The Project area includes aesthetic resources in the vicinity of the facilities to be constructed or modified under the proposed Project.

3.2.1 Environmental Setting

Aesthetics Descriptors

Visual character, visual quality, and visual sensitivity are three terms used throughout this section. "Visual character" is the unique set of landscape features that combine to make a view, including native landforms, water, vegetation patterns, and built features such as buildings, roads, and other structures. "Visual quality" is the intrinsic appeal of a landscape or scene due to the combination of natural and built features in the landscape. Natural and built features combine to form unique perspectives with varying degrees of visual quality. "Visual sensitivity" reflects the level of interest or concern that viewers and responsible land management agencies have for a particular visual resource with visual quality taken into account. "Visual sensitivity" is a measure of how noticeable proposed changes might be in a particular setting and is determined based on the distance from a viewer, the contrast of the proposed changes, and the duration that a particular view would be available to viewers. For example, areas such as scenic vistas, parks, trails, and scenic roadways typically have a high visual quality and visual sensitivity because these locales are publicly protected, appear natural, view durations are typically long, and close-up views are more commonly available. A "scenic vista" is a viewpoint that provides expansive views of a highly-valued landscape for the benefit of the general public.

Regional Setting

The Project area is located in the central and southern portions of Kings County. As a historical lake basin, the Project area is at a relatively low elevation, surrounded primarily by open agricultural land, and mountains in the distance to the east (Sierra Nevada) and west (Temblor Range). Given the expansiveness of the flat lands in the lake bed, the mountains are typically not visible from the Project area. However, the Kings County Land Use Element of the General Plan characterizes the vista from natural high slope terrain across the valley as a scenic vista, and has such, the Project area, as seen from the adjoining Kettleman Hills and Interstate 5, may be considered as such.

The land in the Project area has been converted to productive agricultural lands, consisting mainly of dry grazing and fallowed lands in the proposed reservoir location. Adjacent to the California Aqueduct, the existing system of drainage and irrigation canals is embedded within the agricultural lands in the area and contributes to the region's sense of place and visual character.

Land uses adjacent to the Project facilities consist of varied cultivated row crops and permanent agriculture (orchards), scattered residences, and open space. The area's agricultural and rural landscape is characterized by open fields, overhead electrical utility lines, trees, and fencing. Given the openness and agricultural nature of the lands in the Project area, the visual quality is considered moderate and the visual sensitivity is medium. **Figure 3.2-1** provides a map with the viewpoints and direction for four photographs showing current Project area conditions: **Figures 3.2-2 to 3.2-5** show current conditions at the Empire Weir No. 2, South Fork Canal, proposed Kettleman Reservoir location and at the proposed location for turn-in/turn-out structures on the California Aqueduct.

Figure 3.2-1: Map of Viewpoints for Photographs of Current Site Conditions

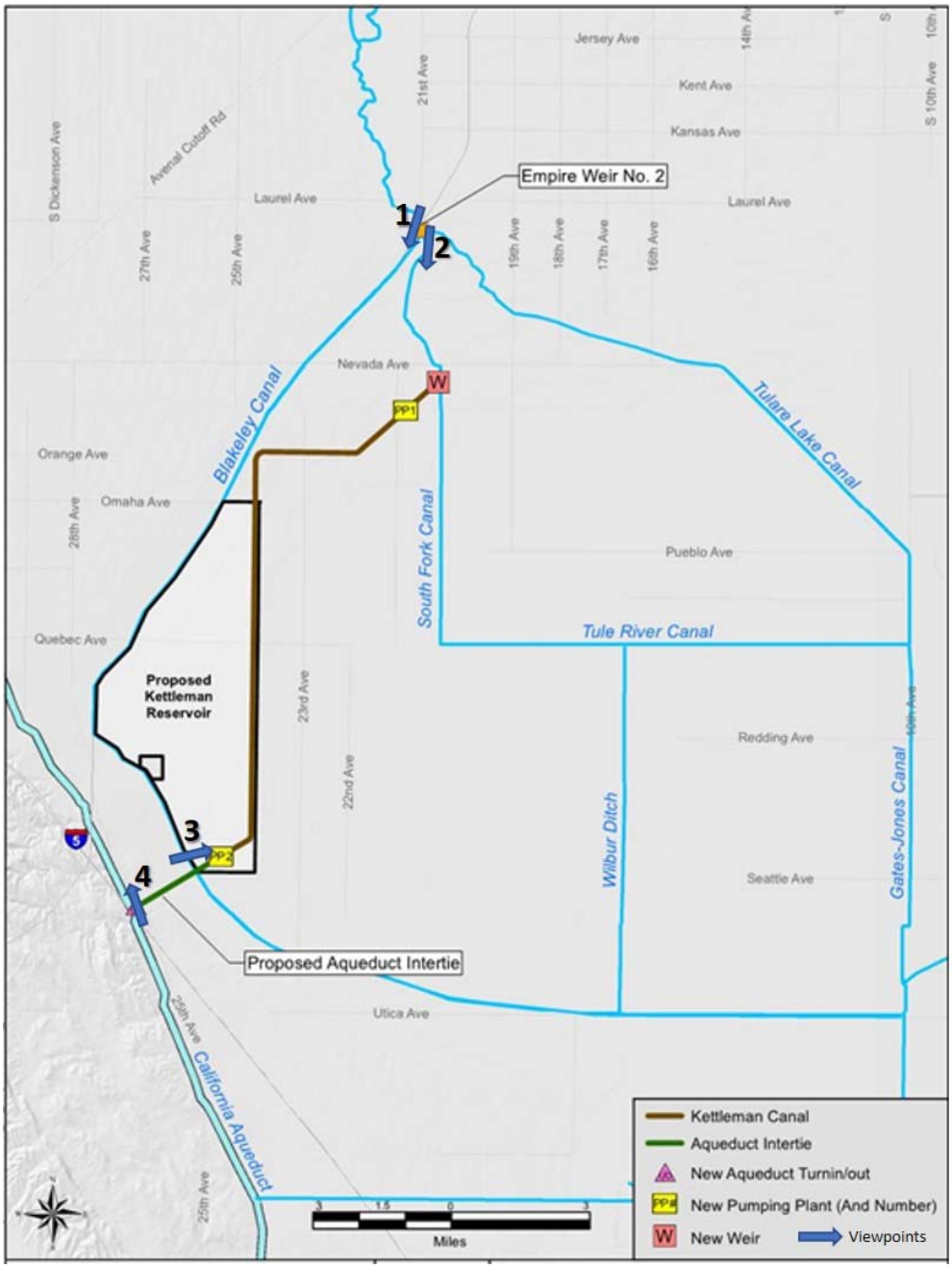


Figure 3.2-2: Current Conditions at Empire Weir No. 2



Figure 3.2-3: Current Conditions at the South Fork Canal near Empire Weir No. 2



Figure 3.2-4: Current Conditions at Proposed Kettleman Reservoir (near proposed Pumping Plant #2 and Maintenance Yard)



Figure 3.2-5: Current Conditions at Location of Proposed Turn-In/Turn-Out Structures on the California Aqueduct



3.2.2 Regulatory Framework

This section describes laws and regulations at the state and local level that may apply to the proposed Project. There are no federal aesthetics regulations that apply to the Project.

State Policies and Regulations

California State Scenic Highways Program

The California Department of Transportation (Caltrans) manages the California Scenic Highway Program, which was created in 1963 by the state legislature as a provision of the Streets and Highways Code to preserve and enhance the natural beauty of California (Caltrans, 2016). The State Highway System includes designated scenic highways and those that are eligible for designation as scenic highways. While there are no designated state scenic highways in the Project area, the portion of State Highway 41 west of State Route 33 in Kings County is classified as eligible for designation under the State Scenic Highways Program, as identified in the California Scenic Highway Mapping System (Caltrans, 2016). This eligible route is approximately 10 miles southwest of the Project area, as shown below in **Figure 3.2-6**. The nearest designated state scenic highways are located outside of Kings County: State Route 180 by Kings Canyon National Park in Fresno County to the east, and State Route 1 along the Pacific Ocean to the west.

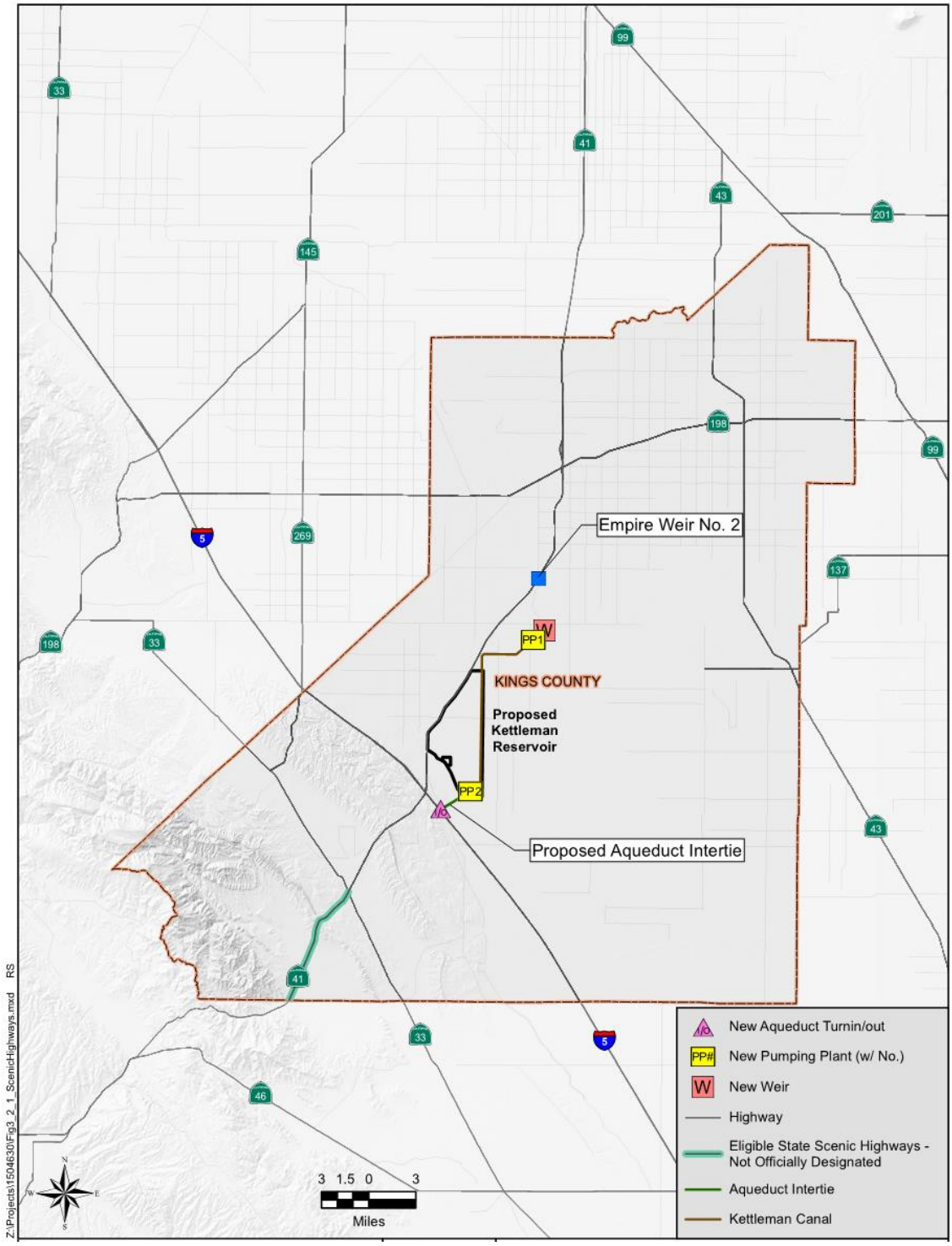
Local Policies and Regulations

Kings County General Plan Open Space Element

Kings County has identified the following objectives and policies in the Open Space Element of its General Plan (2010):

> *OS OBJECTIVE B1.3* Protect the scenic qualities of human-made and natural landscapes and prominent view sheds.
>
> > *OS Policy B1.3.1*: Require new development to be designed so that it does not significantly impact or block views of Kings County's natural landscape or other important scenic features. Discretionary permit applications will be evaluated against this requirement as part of the development review process. New developments may be required, as appropriate, to:
> >
> > - Minimize obstruction of views from public lands and rights-of-way.
> > - Reduce visual prominence by keeping development and structures below ridgelines.
> > - Limit the impact of new roadways and grading on natural settings. Such limits shall be within design safety guidelines.

Figure 3.2-6 Map of California Scenic Highway Program in Kings County



Source: California Scenic Highway Mapping System

3.2.3 Impact Analysis

Methodology for Analysis

This section evaluates whether construction and operations and maintenance of the facilities associated with the proposed Project would result in significant impacts related to aesthetic resources. The visual analysis is based on evaluations of aerial and ground-based photographs of the proposed Project area, site visits, and preliminary design information.

Visual effects were assessed based on the Project's potential to substantially alter scenic resources or to degrade the visual character of the site. The evaluation of temporary or short-term visual impacts considers whether construction activities could substantially degrade the existing visual character or quality of the site or surrounding area, as well as the duration over which any such changes would occur. Because of their short-term nature, construction activities occurring in an area for less than one year are typically considered to have a less than significant effect on visual quality. However, construction activities occurring in an area for over one year have been evaluated for potentially significant visual impacts.

Actions with long-term visual effects, such as constructing new or altered structures, grading roads, removing trees, and introducing new sources of light and glare can permanently alter the landscape in a manner that could affect the existing visual character or quality of the area, depending on the perspective of the viewer. In determining impact potential, the assessment considers the visual sensitivity of the Project area. Because damage to scenic resources such as trees, rock outcroppings, and other features of the built or natural environment would typically constitute a long-term effect, the potential for Project implementation to damage scenic resources is evaluated solely as a long-term effect and is not included in the analysis of construction-related impacts.

Aesthetic resources in the vicinity of existing facilities would not be physically modified, and locations that may be served by the proposed Project, including farms within the Project area, are evaluated in less detail due to the limited potential for adverse aesthetic effects in these areas.

Thresholds of Significance

Consistent with Appendix G of the CEQA Guidelines, an impact on aesthetics would be considered significant if the project would:

- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.
- Substantially degrade the existing visual character or quality of the site and its surroundings or have a substantial adverse effect on a scenic vista.
- Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

Impacts and Mitigation Measures

This section discusses potential impacts to aesthetics that could result from construction and O&M of the Project. Mitigation measures are identified where appropriate.

Impact AES-1 Potential to Damage Scenic Resources, Including Trees, Rock Outcroppings, and Historic Buildings within a State Scenic Highway

All Facilities

The Project area lies approximately 10 miles northeast of the portion of State Highway 41 considered eligible for designation as a California Scenic Highway. The Project area itself is an active agricultural area and contains no scenic or historical resources such as rock outcrops or unique topography.

Approximately 17 acres of land containing almond trees would be cleared for construction of the Aqueduct Intertie and Kettleman Pumping Plant #2, but these trees represent only approximately 1% of trees in the surrounding orchard area. Viewed collectively within the context of the overall Project area and its vicinity, the trees to be removed do not constitute substantial scenic resources, and do not lie within view of a State Scenic Highway; thus, their removal would not alter the scenic quality of a State Scenic Highway. Furthermore, the trees that would be removed are part of an agricultural area, and are typically removed and replanted at the end of a 25- to 30-year period of production. Therefore, the impact on scenic resources from tree removal necessitated by the construction of Project components would be less than significant. No tree removal is anticipated during Project O&M.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact AES-2 Substantially Degrade Existing Visual Character or Quality of Site Surroundings or have a Substantial Adverse Effect on a Scenic Vista.

Project facilities may be visible from the Kettleman Hills, State Highway 41 and Interstate 5 and therefore may affect scenic vistas from those locations; however, as there is no formal viewpoint from which Project facilities would be seen, and as Project facilities would be designed to blend with the surrounding agricultural landscape, the proposed Project facilities would not be readily discernible from any nearby scenic vistas.

Construction

This section discusses potential impacts to aesthetics that could result from construction of the Project. More comprehensive construction details can be found in Chapter 2, *Project Description*.

Storage Facilities

Construction of Project storage facilities could result in temporary, but not long term, construction-related impacts on the visual character or quality of the Project area and immediate vicinity, primarily through the grubbing and grading operations and construction of levees. Although the western side of the proposed reservoir would be less than two miles from Interstate 5 and adjacent to State Highway 41, construction of the storage facilities would only be fleetingly visible from the highways due to the speed of travel. Existing residences located along the Blakeley Canal or by Empire Weir No. 2, as well as motorists using Highway 41 or the affected or nearby roadways, would have foreground views of construction vehicles and earth moving equipment such as earth movers, excavators, front-end loaders, and trucks. It is anticipated that staging areas would be accommodated either within the construction zones, such as at the Aqueduct pump station, or at selected off-site locations within the Project footprint to the extent feasible, such as along Quebec and Racine Avenues. These staging areas would be used to store equipment, vehicles, pipe, and other construction materials for approximately 32 months throughout the duration of construction.

Any obstruction of views resulting from construction activities is expected to be minor and would be short-term. In addition, implementation of **Mitigation Measure AES-1** below would ensure that the Project construction site is kept clean of rubbish and debris from construction activities. Therefore, Project construction would not adversely affect or degrade the existing visual character of the surrounding area or views from the highway.

Conveyance Facilities

Construction of Project conveyance facilities could result in temporary construction-related impacts to the visual character or quality of the Project area and immediate vicinity. The majority of the Project conveyance facilities would be located less than two miles away from Interstate 5; however, due to the distance and speed of travel on the highway, motorists on Interstate 5 would only have fleeting views of construction activities. Similarly, as the proposed Aqueduct Intertie would be located near a highway intersection, construction activities may be visible from Highway 41 and nearby public roadways; however, travelers would only likely have fleeting views of pipeline construction activities due to their speed of travel.

In general, construction would include vegetation removal, grading and excavation, trenching and backfilling. Existing residences located along the canal and motorists using nearby roadways would have foreground views of construction vehicles and equipment such as excavators, compactors, and earth movers. Staging areas for conveyance facilities would be the same as those for the storage facilities. As with construction of the storage facilities, implementation of **Mitigation Measure AES-1** below would ensure that the Project construction site is kept clean of rubbish and debris from construction activities. Therefore, Project construction would not substantially degrade the existing visual character of the surrounding area.

Other Facilities

Both the maintenance yard and electrical substation would be constructed within the Aqueduct tie-in easement. This area adjacent to Kettleman Pumping Plant #2 is land that is currently not used for agricultural production. Nearby motorists would have foreground views of Project construction vehicles and equipment during construction. The Project's electrical tie-in would connect PG&E's existing transmission facilities to the project via transmission and distribution lines, and would include a switchyard and a substation. Two 'external' pumping plants (Kettleman Pumping Plants #1 and #2) and five 'internal' pumping plants would be constructed along Project conveyance facilities and within the storage reservoir, respectively. Construction performed at the maintenance yard or electrical substation or switchyard would follow **Mitigation Measure AES-1** described below to avoid substantial degradation of the visual character of the Project area and immediate vicinity.

Operations & Maintenance

Storage Facilities

The height of the levees surrounding the proposed storage reservoir would vary generally between six to eight feet above the original grade and may cause some visual obstruction. Parts of the storage facilities would be visible from highways, particularly the elevated portions of Interstate 5, and elements such as the turn-in/turn-outs and pumping plants within the reservoirs may also be visible from Interstate 5; however, the levees would be of earthen construction and would blend with the surrounding, unirrigated landscape and visibility would be limited by the high speed of travel on Interstate 5. The reservoir would also be visible from afar at Kettleman Station, which includes service stations, restaurants, and other facilities.

The western boundary of Kettleman Reservoir would be visible along State Highway 41. Although levees would be visible on the east side of the roadway, similar views of agricultural land obstructed by the levee on the east side of the highway would remain available on the west side of the highway. To minimize the

visual effect of the levees, **Mitigation Measure AES-2** would require that the facilities be aesthetically consistent with the surrounding uses, as appropriate and to the extent feasible.

The Project would convert some agricultural fallowed land into shallow surface water storage facilities, which could conceivably affect the agricultural lands' visual character in a positive manner by creating intermittent aquatic and riparian habitat and increasing visual interest in the area.

Conveyance Facilities

Improvements made to the South Fork Canal are not anticipated to significantly alter its visual appearance nor that of the surrounding area. Canal modifications would be primarily limited to deepening the canal and improving turn-in facilities, including construction of the proposed Kettleman Weir diversion structure, to allow diversion out of the South Fork Canal. The proposed Kettleman Canal would be aesthetically similar to existing canals in the area. Turn-in/turn-out structures and pump stations along and adjacent to the South Fork Canal and the Blakeley Canal would be fleetingly visible to motorists traveling along Interstate 5, State Highway 41, or 25th Avenue. As with the storage facilities, **Mitigation Measure AES-2** would be implemented to minimize the effect of the conveyance facilities' on the visual character of the area.

Upon Project implementation, operation of the Project would bring additional flood flows to the conveyance facilities. As with the storage reservoir, the additional water in the conveyance facilities could potentially enhance wildlife viewing opportunities, potentially resulting in a beneficial effect on the area's visual character. O&M of the Project's conveyance facilities would result in a less than significant impact.

Other Facilities

The maintenance yard and electrical switchyard and substation would be constructed on open land currently not used for agricultural production. As with the rest of the facilities, **Mitigation Measure AES-2** would be implemented to minimize the visual impact of these other facilities. With this mitigation measure, Project-related visual alterations to the Project area would be limited to the extent feasible and consistent with the area's existing visual character. The two external pumping plants, Kettleman Pumping Plant #1 and #2, would likewise be fenced and designed to minimize visual impact. These pumping plants may, however, contain up to three large diameter steel standpipes painted in red and white stripes and up to 140-feet tall; though, alternatively, air chambers could also be used for hydraulic control. **Figure 3.2-7** shows a typical Semitropic standpipe. As many similar standpipes can be found in the region, their design at the proposed Project area is not statistically significant, and therefore, impacts on scenic resources and the visual character of the site would be less than significant.

Figure 3.2-7 Existing Semitropic Standpipe



Source: https://www.flickr.com/photos/eyetwist/18254442983

Significance Determination before Mitigation

Potentially significant impacts.

Mitigation Measures

The following measures are applicable to the Project's construction and O&M periods:

Mitigation Measure AES-1: Maintenance of Construction Worksite

Throughout the period of site preparation and construction, Semitropic would require that the construction contractor keep the worksite free and clean of all rubbish and debris and promptly remove from the site or from property adjacent to the site of the work, all unused and rejected materials, surplus earth, concrete, plaster, and debris. Additionally, as appropriate, all worksites would be visually screened from adjacent residential and commercial areas to minimize visual impacts.

Mitigation Measure AES-2: Design of Facilities to Be Aesthetically Consistent with Existing Visual Character

Semitropic would require all new facilities to be, at a minimum, designed to be aesthetically consistent with existing visual character and the surrounding area, as appropriate and consistent with surrounding land uses.

Significance Determination after Mitigation

Less than significant.

Impact AES-3 New Source of Substantial Light or Glare

Construction

All Facilities

As discussed in *Chapter 2, Project Description*, throughout the approximately 32-month construction duration, construction activities would primarily occur on weekdays from 7:00 AM to 6:00 PM. However, if necessary, construction could take place during nighttime and the contractor would be responsible for obtaining permits for any nighttime or after-hours construction. Temporary views of nighttime construction lighting could be a nuisance to adjacent residences and motorists traveling in the vicinity of the Project area. To minimize any temporary adverse effects on residential views during the duration of nighttime construction, implementation of **Mitigation Measure AES-3** would ensure that nighttime construction lighting is shielded and oriented downward, thereby reducing this impact to a less than significant level.

Operations & Maintenance

All Facilities

Automatic sensor lights may be installed on Project facilities for safety and security purposes, particularly at the pumping plants and the electrical switchyard and substation. New lights would represent a new permanent source of light that could be seen from nearby roads. Lights would be motion-activated and thus would not be on continuously. However, views of nighttime lighting could be a nuisance to motorists traveling on roads near the facilities, which would be a potentially significant impact.

As described above, both daytime and nighttime sources of light and glare due to Project O&M would be intermittent in nature. **Mitigation Measure AES-4** would ensure that lights would be shielded and directed inward/downward towards the facilities and would not generate substantial glare. For this reason, and because there are no other sensitive viewers in the area, the impact related to new permanent sources of light and glare would be less than significant with mitigation.

Significance Determination before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure AES-3: Nighttime Construction Lighting
If nighttime construction is required, nighttime construction lighting shall be shielded and oriented downward to minimize effects on any nearby receptors. Lighting shall be directed toward active construction areas only, and shall have the minimum brightness necessary to ensure worker safety.

Mitigation Measure AES-4: Directional Security Lighting
Nighttime security and associated parking lighting fixtures shall be equipped with directional shields that aim light downward and away from adjacent roadways. In addition, the placement of lighting fixtures would be selected to concentrate light on site and avoid spillover to other areas.

Significance after Mitigation

Less than significant.

Cumulative Impacts

The geographic scope of potential cumulative impacts related to aesthetic and visual resources encompasses the Project area and immediate vicinity. There are six projects identified within the immediate vicinity of the proposed Project that may contribute to cumulative impacts:

- Quay Valley Community Development - a new 7,175-acre community to be developed in south Kings County.
- Kettleman Hills Facility Expansion - expanding the existing B-18 Landfill and construct a new B-20 Landfill for hazardous waste and designated waste disposal.
- Kettleman City Surface Water Treatment Plant and Commercial Water Storage Tanks (Treatment Plant) – construction of a new surface water treatment plant to treat surface water for potable supply.
- Southwest Groundwater Banking Project – development of a project to divert and store floodwater from the Kings River and local stormwater.
- JID Distributed Recharge Bypass and Lassen Projects – improvement to and construction of recharge facilities to divert and store floodwater from the Kings River.
- Terranova On-Farm Flood Capture and McMullin Recharge Site – improvements to and construction of facilities to divert floodwater from the Kings River for recharge on existing farm lands.

The geographic scope of the cumulative impacts on aesthetic resources encompasses the Project area and surrounding areas from which the project would be visible. As with the proposed Project, construction and O&M of the nearby projects would also be visible from public roads such as Interstate 5. If the proposed Project and other relevant projects listed above were constructed simultaneously, they could adversely affect the same scenic resources or views from public roads. Given the current status of each of the projects, it is not expected that construction would be simultaneous. In addition, given the temporary nature of the construction, the short duration of views available to motorists and residents, and compliance with standard environmental commitments related to site cleanliness and screening during construction and design for consistency with the surrounding area to address operational impacts, the proposed Project's contribution to cumulative construction and O&M impacts on visual resources would not be considerable and thus cumulative impacts would be less than significant.

As described in **Impact AES-3**, project lights may create a nuisance to motorists and residents near construction areas and would contribute to cumulative light or glare impacts in the event that construction requires nighttime construction lighting. However, nighttime construction is expected to be infrequent, and if required, implementation of **Mitigation Measure AES-3 (Nighttime Construction Lighting)** would ensure that construction lighting is oriented downwards towards the work areas, thus minimizing impacts. With implementation of this measure, the proposed Project's contribution to this cumulative impact would not be considerable and cumulative impacts would be less than significant.

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3.3 Agriculture and Forestry Resources

This section presents the physical and regulatory setting for agricultural and forestry resources, summarizes the applicable regulatory framework, and identifies impacts to agricultural resources that would occur as a result of implementation of the proposed Project. No forestry resources exist in the Project area and so impacts to these resources have not been evaluated.

3.3.1 Environmental Setting

Regional and Local Setting

The Project area for this analysis includes parts of Kings County in the vicinity of Kettleman City. All construction would take place on unincorporated land in Kings County, principally on agricultural lands tilled and/or grazed historically and/or currently. The proposed Project could affect agricultural areas in other counties as well, for example by providing supplement supplies to help meet the irrigation demands of existing crops in both Kern and Kings Counties, in some cases in lieu of pumping native groundwater, and to help prevent agricultural lands from going out of production particularly in light of the anticipated reductions in groundwater use by implementation of the SGMA effective January 1, 2015, Water Code section 10720 *et seq*. Kings County has historically been, and continues to be, a large agricultural production area, with over 90 percent of the County designated for agricultural uses (Kings County, 2010f). Agriculture is an important economic resource for Kings County; however, an increasing trend in Kings County is the fallowing of land that would otherwise have been planted. While periodic fallowing of agricultural land is a normal part of farming, the fallowing in Kings County has been in response to shortages in water deliveries for irrigation. Restrictions on pumping from the Sacramento-San Joaquin River Delta in recent years have reduced the reliability of SWP deliveries. According to DWR's *Draft State Water Project Delivery Capability Report* (2015), the SWP is projected to yield, on average, 62 percent of the contracted amounts under existing conditions. Areas of the county with poor groundwater supplies are more susceptible to fallowing of agricultural land; Kings County has been susceptible to these limitations. Following the 2007 growing season, approximately 76,322 acres of farmland was fallowed, due primarily to reduced water supplies from state and federal water delivery systems (Kings County, 2009).

Crops and Production

Various crops and agricultural products are grown throughout Kings County. There are approximately 1,100 farms in the county spread across approximately 821,400 acres, averaging 681 acres per farm (CDFA, 2016; Kings County, 2009). Field crops are the most predominant landscape across most of the County, with smaller concentrations of vegetable and seed crops spread throughout. Livestock and poultry are mostly scattered throughout the northern parts of the County near the cities of Hanford and Lemoore.

Agriculture in Kings County generates more than a billion dollars annually; in 2016, the gross value of all agricultural crops and products produced in Kings County was $2,002,192,000, as shown in **Table 3.3-1** (CDFA, 2016).

Table 3.3-1: Kings County 2016 Agricultural Production by Commodity Category

Category	Total
Apiary Products	$10,457,000
Field Crops	$367,600,000
Fruit & Nut Crops	$525,113,000
Livestock & Poultry	$274,191,000
Livestock & Poultry Products	$640,259,000
Seed Crops	$8,739,000
Vegetable Crops	$175,833,000
TOTAL	**$2,002,192,000**

Source: Kings County 2016 Agricultural Crop Report, 2016.

Milk and cotton are the two biggest commodities by total value produced in Kings County**.** Additional leading commodities in Kings County include cattle, pistachios, almonds, tomatoes, walnuts, corn silage, alfalfa, and grapes, as shown in **Table 3.3-2** (CDFA, 2016).

Table 3.3-2: Kings County Top 10 Agricultural Commodities in 2016

Commodity	Rank	Value
Milk, Total	1	$636,909,000
Cotton, Total	2	$221,662,000
Cattle and Calves	3	$220,137,000
Pistachios	4	$178,588,000
Almonds, Total	5	$123,011,000
Tomatoes Processed	6	$119,216,000
Walnuts	7	$56,276,000
Corn, Silage	8	$45,525,000
Grapes, Total	9	$37,650,000
Peaches, Total	10	$31,841,000

Source: Kings County 2016 Agricultural Crop Report, 2016

Types of Farmland

The definitions of the various types of farmland discussed below are provided in *Section 3.2.2, Regulatory Framework, State Policies and Regulations, Farmland Mapping and Monitoring Program*. According to the Farmland Mapping and Monitoring Program (FMMP), Kings County consists of approximately 41 percent Farmland of Statewide Importance, 35 percent Grazing Land, and 13 percent Prime Farmland, as summarized below in **Table 3.3-3** and in **Figure 3.3-1**.

Table 3.3-3: Countywide Farmland Mapping and Monitoring Program Land Use Designations

Land Use Category	Acres	Percent of Land Use
Prime Farmland	112,255	13%
Farmland of Statewide Importance	365,024	41%
Unique Farmland	19,219	2%
Farmland of Local Importance	11,035	1%
Grazing Land	313,864	35%
Urban and Built-Up Land	37,194	4%
Other Land	32,145	4%
Water Area	62	0%
Total Acres	**890,798**	

Source: California Department of Conservation, 2014.

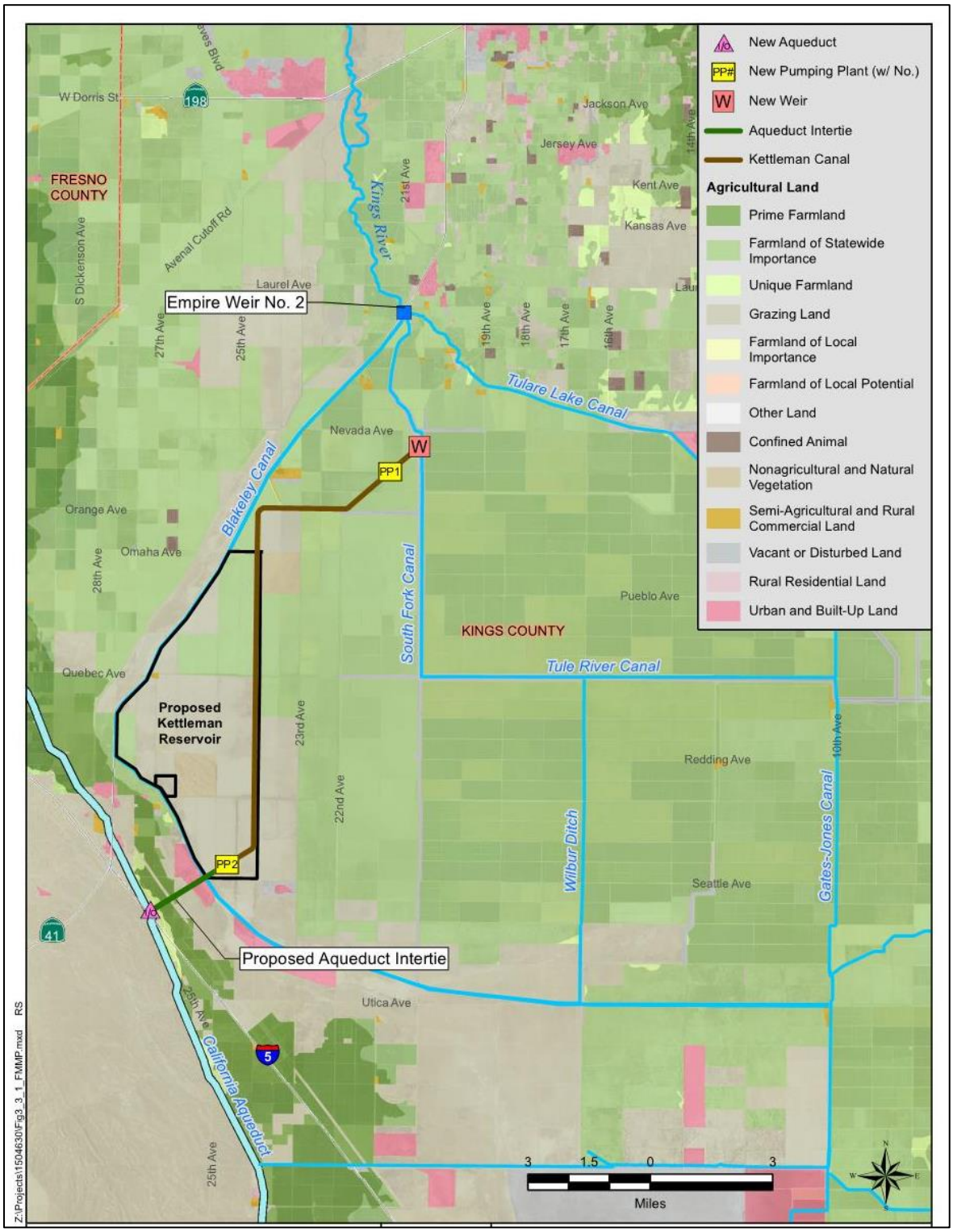
Important Farmland in the Project Area

The majority of land in the Project area is classified by the California Department of Conservation (CDOC) as Grazing Land and Farmland of Statewide Importance. Additional classifications of land in the Project area include Semi-Agricultural and Rural Commercial Land, Non-Agriculture/Natural Vegetation, and Urban and Built-Up Land. As shown in **Figure 3.3-1**, nearly all the land underlying the proposed Kettleman Reservoir is classified as Farmland of Statewide Importance and Grazing Land (CDOC, 2015b) and would be located on lands that were historically tilled and are presently used for grazing.

The proposed Kettleman Canal would be located on land generally classified as Farmland of Statewide Importance with some smaller areas classified as Vacant or Undisturbed Land (CDOC, 2015b). The proposed canal would be constructed on lands current tilled (north of the proposed reservoir site) and/or grazed (within the proposed reservoir site). The Aqueduct Intertie facilities (including pipelines and pumping station) would be located on lands classified as Unique Farmland, Prime Farmland, Grazing Land, and Urban and Built-Up Land which are currently used as irrigated agriculture (predominantly almond orchards). Other facilities constructed as part of the Project, including the maintenance yard and electrical substation, would be constructed on land classified as Grazing Land and Prime Farmland. The turn-in/turn-out structure would be constructed on existing California Aqueduct lands.

To be eligible for a Farmland Security Zone (FSZ) contract, the subject land must be designated on the FMMP maps as either Prime Farmland, Farmland of Statewide Importance, Unique Farmland, or Farmland of Local Importance. Portions of the Project would be located on land categorized as Farmland of Statewide Importance, Unique Farmland and Prime Farmland and, therefore, many of these properties are under FSZ contracts, as discussed below.

Figure 3.3-1: FMMP Farmland Types



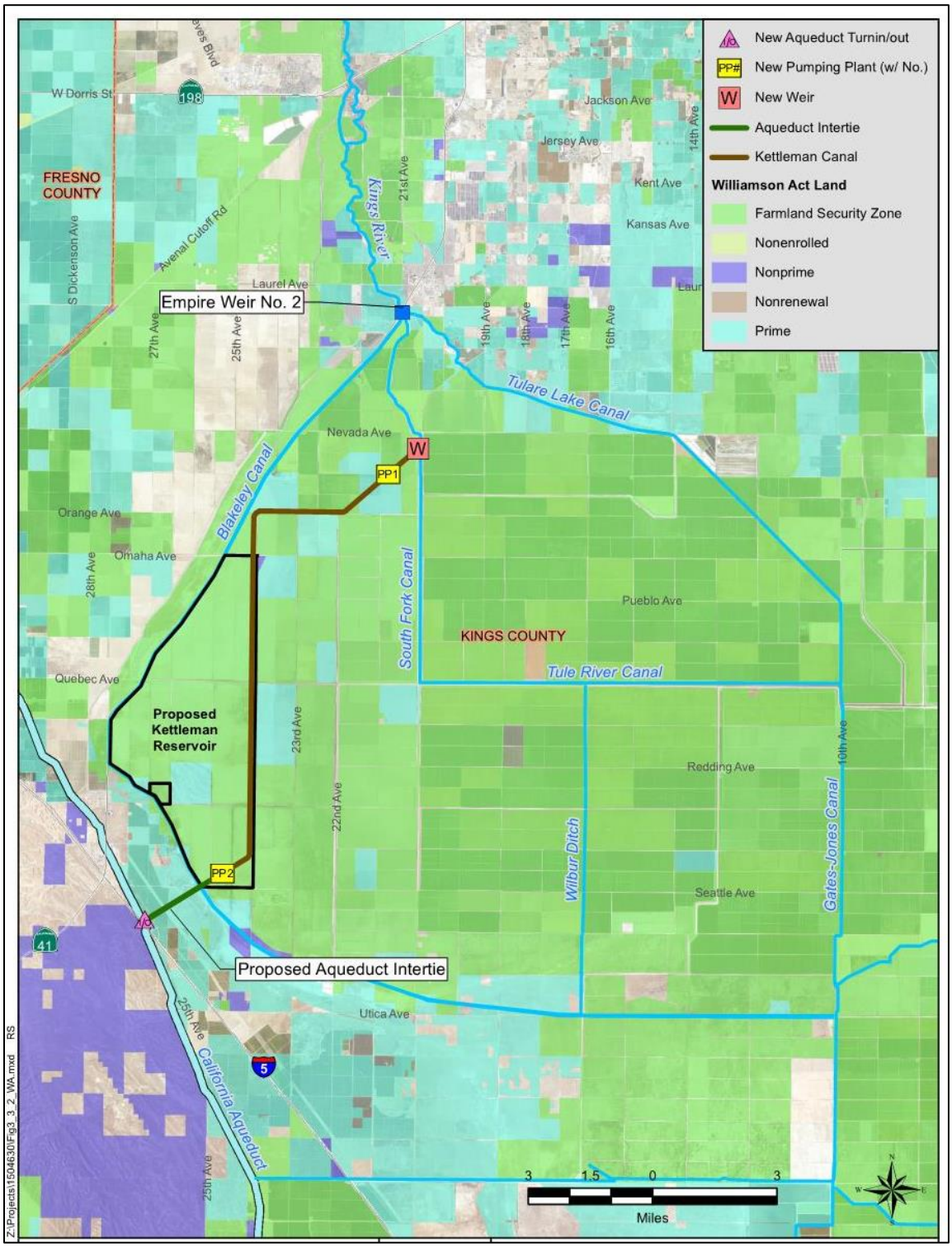
Williamson Act and Farmland Security Zone Contracts

As shown in **Figure 3.3-2**, all land within the Project area is under a Williamson Act or FSZ Contract (CDOC, 2015b). Storage facilities and other project facilities (including the maintenance yard and electrical substation) would be constructed entirely on land with Williamson Act or FSZ contracts (28 affected parcels total). Portions of the Aqueduct Intertie facilities would be located on non-contracted agricultural land. Most land adjacent to conveyance facilities is also under Williamson Act and FSZ contracts. Each project facility is summarized by its land use classification and contract status below in **Table 3.3-4**.

Table 3.3-4: Summary of Agricultural Land Use Classification by Project Facility

Project Facility	Farmland Classification	Williamson Act or FSZ Contract?
Kettleman Reservoir	Grazing Land Prime Farmland Farmland of Statewide Importance Non-agricultural/Natural Vegetation	Yes
Empire Weir No. 2	Prime Farmland Farmland of Statewide Importance	No
Kettleman Pumping Plant #1	Farmland of Statewide Importance	No
Kettleman Pumping Plant # 2	Grazing Land	Yes
Kettleman Weir	Farmland of Statewide Importance	Yes
Aqueduct Intertie Facilities	Prime Farmland Unique Farmland Grazing Land Urban and Built-up Land	Yes
Maintenance Yard & Electrical Substation	Grazing Land Prime Farmland	Yes
Blakeley Canal	Prime Farmland Farmland of Statewide Importance Semi-Agricultural and Rural Commercial Land	Yes
South Fork Canal	Farmland of Statewide Importance	Yes
Kettleman Canal	Farmland of Statewide Importance Grazing Land	Yes

Figure 3.3-2: Williamson Act and Farmland Security Zone Contracts in the Project Area



3.3.2 Regulatory Framework

Federal Policies and Regulations

Farmland Protection Policy Act

The Farmland Protection Policy Act (FPPA) requires federal agencies to (a) evaluate the adverse effects of their programs on the preservation of farmland; (b) consider alternative actions that could lessen adverse effects, and (c) ensure that their programs are compatible with state and local programs and policies for the protection of farmland. Farmland is defined as prime or unique farmlands as determined by the appropriate state or local agency. Federal agencies are required to develop and review their policies and procedures to implement the FPPA every two years (USDA-NRCS, 2016b).

State Policies and Regulations

Farmland Mapping and Monitoring Program

The FMMP, administered by CDOC, produces maps and statistical data for use in analyzing impacts on California's agricultural resources (CDOC, 2015a). The FMMP rates agricultural land according to soil quality and irrigation status and publishes Important Farmland maps. FMMP maps are updated every two years using a computer mapping system, aerial imagery, public review, and field reconnaissance (CDOC, 2015a). Important Farmland categories are as follows (CDOC, 2015b):

- *Prime Farmland:* Farmland with the best combination of physical and chemical features able to sustain long-term agricultural production. These lands have the soil quality, growing season, and moisture supply needed to produce sustained high yields. Prime Farmland must have been used for irrigated agricultural production at some time during the four years before the FMMP's mapping date.

- *Farmland of Statewide Importance:* Farmland similar to Prime Farmland, but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Farmland of Statewide Importance must have been used for irrigated agricultural production at some time during the four years before the FMMP's mapping date.

- *Unique Farmland:* Farmland of lesser quality soils used for the production of the state's leading agricultural crops. These lands usually are irrigated but may include non-irrigated orchards or vineyards as found in some climatic zones. Unique Farmland must have been cropped at some time during the four years before the FMMP's mapping date.

- *Farmland of Local Importance***:** Land of importance to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee.

- *Grazing Land:* Land on which existing vegetation is suited to the grazing of livestock.

- *Urban and Built-Up Land:* Land occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately six structures to a 10-acre parcel. This land is used for a variety of developed purposes, including residential, industrial, commercial, construction, institutional, public administration, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, and water control structures.

California Land Conservation Act of 1965 (Williamson Act)

The California Department of Conservation, Division of Land Resources Protection administers the Williamson Act, a state land use policy that is intended to preserve agricultural land and open space. The Williamson Act is implemented by creating a voluntary contract with property owners that restricts land use for 10 years, with an automatic annual renewal. In return for the agreement to restrict the use of land for agriculture, the landowner receives preferential property tax rates based on the current use of the land rather than its market value. Williamson Act contracts may be cancelled by Kings County upon a finding by the county that the cancellation is in the public interest and payment of a cancellation fee. The cancellation becomes effective upon issuance of an entitlement for conversion of the land to its new use.

A Williamson Act Contract may be terminated either through nonrenewal (preferred method) or cancellation (KCCDA, 2013). To terminate a Williamson Act Contract, a landowner may file a notice of nonrenewal. Beginning on the next contract anniversary date, the contract winds down over the remaining (usually nine-year) term with the landowner's property taxes gradually increasing until they reach the full unrestricted rate at the end of the nonrenewal period (KCCDA, 2013).

Per the Williamson Act 2014 Status Report, approximately 15.4 million acres were enrolled under the Williamson Act statewide as of 2013 (CDOC, 2015c). As of 2014, Kings County had 677,257 acres under Williamson Act enrollment (CDOC, 2015c).

Farmland Security Zone Contract

The Farmland Security Zone Contract is a contract between a private landowner and a county that extends the ten-year period under a Williamson Act contract to 20 years in return for greater property tax benefits. Like a Williamson Act contract, a Farmland Security Zone contract self-renews annually; thus, unless either party files a "notice of nonrenewal," the contract is automatically renewed each year. A FSZ is created within an agricultural preserve[1] by a Board of Supervisors upon request by a landowner or group of landowners.

According to the Williamson Act 2014 Status Report, approximately 874,946 acres were enrolled under the Farmland Security Zone program statewide as of 2014 (CDOC, 2015d). As of 2013, Kings County had 287,730 acres enrolled under the Farmland Security Zone program, approximately 42 percent of the county (CDOC, 2015c).

Local Policies and Regulations

Physical facilities for the Project would be located in unincorporated Kings County, near Kettleman City. Policies for Kings County are presented below.

County of Kings Implementation Procedures for the Williamson Act and Farmland Security Zone Contracts

The Kings County's *Implementation Procedures for California Land Conservation "Williamson" Act of 1965 including Farmland Security Zones*, as updated November 27, 2013 and administered by the Kings County Community Development Agency, lists the following as "commercial agricultural" or "compatible uses" among others:

[1] An agricultural preserve defines the boundary of an area within which a city or county will enter into Williamson Act contracts with landowners. The boundary is designated by resolution of the board or city council having jurisdiction. Agricultural preserves must generally be at least 100 acres in size.

- "Grazing and feeding of sheep, goats, horses, mules, swine, bovine animals, and other similar domesticated quadrupeds." (Appendix A, ¶ A.3.c.)
- "Irrigation and flood control facilities; public utility and public service structures including electric transmission and distribution substations, gas regulator stations, communications equipment buildings, public service pumping stations, and reservoirs." (Appendix A, ¶ B.7.)
- "Public uses of administrative, public service, or cultural type, including, city, county, state, or federal uses such as parks…."(Appendix A, ¶ B.10.)

Right to Farm Ordinance

Passed in 1996, Kings County aimed to reduce conflict between agricultural and non-agricultural land uses by vowing to protect the rights of commercial farming operations. The Kings County Right to Farm Ordinance (Ordinance No. 546.1) states that it is the policy of the County to "protect agricultural land, operations, and facilities from conflicting uses due to the encroachment of incompatible, non-agricultural uses of the land in agricultural areas of the county" and to "advise developers, owners, and subsequent purchasers of property in the County of the inherent potential inconveniences and discomforts often associated with agricultural activities and operations, including, but not limited to, equipment and animal noise, farming activities conducted on a 24-hours a day, 7-days a week basis; odors from manure, fertilizers, pesticides, chemicals, or other sources; the aerial and ground application of chemicals and seeds; dust; flies and other insects; and smoke from agricultural operations." Although agriculture is the main priority, the Ordinance aims to promote a "good neighbor policy" between agriculture and non-agriculture property owners by ensuring that non-agriculture uses in agricultural-designated areas remain limited, and less intensive agricultural uses are permitted near urban areas. The Ordinance notifies land owners that they live within an agricultural County and may be subject to agriculture-related inconveniences or discomforts to prevent neighborly conflicts.

Kings County General Plan

The Kings County General Plan guides development for the County within a 20-year planning horizon. The Land Use Element of the County's General Plan designates the Project within unincorporated territory and as Agriculture Open Space (Kings County, 2010h). The Agriculture Open Space classification includes the designations of Limited Agriculture, General Agriculture 20-Acre, General Agriculture 40-Acre, and Exclusive Agriculture; however, the Project is completely designated as General Agriculture 40-Acre (Ag-40). This classification is intended to "define distinct areas of agricultural intensity, and protect agricultural land from the encroachment of incompatible uses." The Land Use Element contains the following goals relevant to agricultural uses:

Land Use Element

- *LU Goal B1: Protect Agricultural Lands throughout the County* - In particular, LU Goal B1 seeks to protect lands along the edges of community districts and Urban Fringe by maintaining large parcel sizes and preventing the premature development of incompatible urban uses. Economic pressure and economic advantages of land development have influenced many landowners to divide their land and sell it for nonagricultural uses, resulting in large numbers of non-farm residential uses on some of the County's most prioritized agricultural lands.
- *LU Objective B1.1:* Preserve the integrity of the County's agricultural land resources through agricultural land use designations and other long-term preservation policies.
    - *LU Policy B1.1.1:* Designate all agricultural and grazing land outside of planned urban areas as Limited Agriculture, General Agriculture, Exclusive Agriculture, or Natural Resource Conservation.

- *LU Policy B1.1.2*: Continue to use Williamson Act and Farmland Security Zone contracts on all priority agricultural lands outside the Primary Sphere of Influence of City and Community District boundaries as defined by LAFCO, so long as State "Open Space Subvention Act" funds remain available.
- *LU Policy B1.1.3:* The preferable method of Williamson Act or Farmland Security Zone contract removal is through Notice of Non-Renewal by either the land owner or County, and through contract termination of "Protested" contracts upon annexation to a City. Cancellation of contracts should be discouraged unless State required findings can be sufficiently made pursuant to Government Code Section 51280 *et seq.*
- *LU Policy B1.1.4:* Pursue development of alternative programs for the long-term preservation of prioritized agricultural land within the County to supplement existing programs, and ready for the potential phase-out of Williamson Act and Farmland Security Zone contracts resulting from State elimination of subvention.

- *LU Objective B1.2:* Maintain large parcel sizes of agricultural designated land within Urban Fringe areas and around Community Districts to retain viable agricultural production until such time as land is planned and ready for conversion to other uses.
- *LU Goal B2:* Agricultural production continues to be supported and enhanced in areas designated for agriculture, while conflicts between agriculture and non-agricultural uses are minimized.
  - *LU Objective B2.1:* Recognize agriculture as the highest and best use of agricultural-designated land and preserve the right of farmers and agricultural operations to continue customary and usual agricultural practices, and operate in the most efficient manner possible.
    - *LU Policy B2.1.1:* The primary use of land designated as Limited Agriculture, General Agriculture, and Exclusive Agriculture shall remain devoted to agricultural uses and related supported services.
    - *LU Policy B2.1.3:* Maintain implementation of the County's "Right to Farm Ordinance" adopted in 1996 to continue placing land owners on notice that they live within an agricultural County and may be subject to agriculture related inconveniences or discomforts.
- *LU Goal B3:* Allow Agricultural Support Services within Designated Areas – The minimum parcel size in the South County (south of Kansas Avenue) where the Project is located is 40 acres.
- *LU Goal B6:* Agricultural Areas Provide Secondary Benefits by Serving as Essential Public Safety Buffers for Strategic Military Installations and Floodwater Drainage, and Serve to Protect the Wellbeing of Residents and Business Investments which are Critical to the Sustainability of the County.
  - *LU Objective B6.2:* Identify agricultural areas that may serve as emergency floodwater storage or drainage areas
    - *LU Policy B6.2.1:* Flood zones within the General Agricultural designations shall be considered appropriate land use areas that have the potential to receive emergency floodwater. Specific basin sites shall be determined by the relevant water, irrigation, reclamation or flood control district having authority over territories along waterways and the Tulare Lake Basin.

- *LU Goal B7:* Community Benefiting Non-Agricultural Uses Remain Compatible within the County's Agriculture Open Space Area, and are Supported for their Continued Operation and Existence
    - *LU Objective B7.1:* Allow compatible Open Space and Public uses of land within the Agriculture Open Space area of the County
        - *LU Policy B7.1.2:* Designate community benefitting isolated sites within the Agriculture Open Space area that are devoted to schools, utility power facilities, municipal wastewater services as Public designated land use.

Open Space Element

The Kings County Open Space Element (Kings County, 2010h) identifies the County's "open space land" and establishes guiding goals for the preservation and conservation of land within the County that is essentially unimproved and devoted to open space use (e.g. natural resources, outdoor recreation, public health and safety). The Open Space Element includes the following goals relative to agriculture:

- *OS Goal A1:* Preserve Agricultural Land as Open Space

Resource Conservation Element

The Kings County Resource Conservation Element (Kings County, 2010i) identifies natural resources throughout the County and establishes policies for the conservation, development and utilization of these resources, such as water, agriculture, and soils. The Resource Conservation Element includes the following goals relative to agriculture:

- *RC Objective B1.1:* Identify the County's highest priority agricultural lands that are critical to the County's agricultural economy, prime soils, and water availability, and emphasize higher preservation efforts for these areas.
- *RC Objective C1.1:* Conserve prime agricultural soils, and avoid their conversion to nonagricultural uses.
    - *RC Policy C1.1.1:* Apply one of the four Agriculture land use designations to areas with productive and potentially productive agricultural soils and grazing land.

Kings County Zoning Ordinance

Consistent with the General Plan Land Use Designation, the Project is in a General Agriculture-40 (AG-40) District, which is intended for extensive or intensive agriculture use (Kings County Zoning Ordinance, Article 4, Agricultural Zoning Districts). The minimum parcel size is 40 acres. The Zoning Ordinance defines allowable uses within each zoning district and in the AG-40 District, permitted uses include "Irrigation, flood control and drainage facilities, percolation basins, groundwater recharge wells and evaporation ponds" and "Public utility and public service structures including … Reservoirs." As permitted uses, these types of facilities are considered consistent with agricultural zoning, and no Conditional Use Permit or other type of land use permit is required.

3.3.3 Impact Analysis

Methodology for Analysis

This section evaluates whether construction and operation of the facilities associated with the proposed Project would result in significant impacts related to agriculture resources. It considers the extent to which the proposed Project could result in conversion of farmland to non-agricultural uses, either temporarily or permanently. In general, temporary impacts would not be considered significant. It also considers the

proposed Project's consistency with existing zoning in the locations where facilities would be modified or constructed.

Impacts to forestry are not evaluated because no forestry resources exist within the Project area.

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines*, an agricultural impact would be considered significant if the project would:

- Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps prepared pursuant to the FMMP of the California Resources Agency, to nonagricultural use.
- Conflict with Existing Zoning for, or Cause Rezoning of, Forest Land (as Defined in Public Resource Code Section 12220 (g)), Timberland (as Defined by Public Resource Code Section 4526), or Timberland Zoned Timberland Production (as Defined by Government Code Section 51104 (g))
- Conflict with existing zoning for agricultural use or a Williamson Act Contract.
- Result in the loss of forest land or conversion of forest land to non-forest use.
- Involve other changes in the existing environment that, because of their location or nature, could result in a conversion of Farmland to a non-agricultural use.

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to actions associated with Tulare Lake Storage and Floodwater Protection Project are identified below along with a supporting rationale as to why further consideration is unnecessary and a no impact determination is appropriate.

- *Conflict with existing zoning for, or cause rezoning of, forest land.* The Tulare Lake Storage and Floodwater Protection Project, including all project elements, would not be developed in existing forest land, nor would it cause the re-zoning of existing forest land; therefore, there would be no impact to the existing zoning of forested land.
- *Result in the loss of forest land or conversion of forest land to non-forest use.* There is no forested land within the Project area. Construction and operation of the Tulare Lake Storage and Floodwater Protection Project would not result in the loss of forest land or conversion of forest land to non-forest land; therefore, there would be no impact.

Impacts and Mitigation Measures

Impact AG-1 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

Construction

Storage Facilities

As shown in **Figure 3.3-1,** the Kettleman Reservoir site is in an area primarily categorized as Grazing Land, but also includes Farmland of Statewide Importance. Other land classifications within the reservoir include Non-agricultural/Natural Vegetation, Semi-Agricultural and Rural Commercial Land, and Urban and Built-Up Land. Currently, land within the proposed reservoir site is mostly fallowed, though it has used for grazing and agricultural production. During construction of the reservoir, approximately 8,080 acres of Grazing land, 2,961 acres of Farmland of Statewide Importance, 695 acres of Non-agricultural/Natural

Vegetation, 20 acres of Semi-Agricultural and Rural Commercial Land, and two acres of Urban and Built-Up Land would be affected.

Throughout the anticipated three- to five-year construction period for the proposed Project, none of the land categorizations would change significantly. The landowner uses portions of this area for grazing. Although portions of the land in the location of the proposed reservoir would not be used for grazing during the construction period, grazing can occur in non-construction areas and grazing may resume during Project operations when the reservoir is not flooded, and therefore, the land within the Project area would not permanently lose its classification as an important agricultural resource. Additionally, the majority of this land is currently fallowed due to a lack of reliable water supply and/or other factors. A temporary halt in grazing during the construction phase would not differ from the current land use and is consistent with fallowing and grazing practices that are already implemented on the site. Dry grazing and related agricultural operations would be able to resume once construction was completed and staging areas are removed.

All soils excavated on the Project site would be applied on site for use; no import or export of soils is anticipated. Loss of topsoil could reduce the value of agricultural land, resulting in a change in the farmland category designation under the FMMP, which is a potentially significant impact. (Topsoil is defined as the thin, rich surface layer of soil where most nutrients for plants are found. Topsoil is typically the top two to eight inches of soil.) However, implementation of **Mitigation Measure AG-1** would conserve topsoil and reduce potential impacts to less than significant, thereby complying with FMMP's soil criteria and *RC Objective C1.1* in the *Kings County General Plan Resource Conservation Element* to conserve agricultural soils (Kings County, 2010i). Specifically, under **Mitigation Measure AG-1**, topsoil removed via grading and/or excavation in Project construction areas that will not ultimately contain either a levee, fenced area or paved area would be stockpiled, replaced and reseeded in those areas as part of the site restoration to support future grazing during non-flooded Project operational periods. For those areas where topsoil would be removed via grading and/or excavation in Project construction areas that will, post-construction, contain either a levee, fenced area or paved area, topsoil would be stockpiled, replaced and reseeded at other locations within the Project footprint in areas that, post-construction, would support grazing. Additionally, at no time would topsoil be used for levee construction.

Given that construction impacts would be temporary and agricultural activities could resume following construction, construction would not conflict with the purpose of Kings County's General Plan, which is to "Recognize agriculture as the highest and best use of agricultural designated land" (Land Use Objective B2.1). Once constructed, only 1.9 percent of the overall Project area (approximately 300 acres of the overall 16,700 acres) would no longer be grazable (i.e. it would be in either a fenced area or contain a levee). The vast majority of land in the Project area could resume being grazed, which would remain the dominant use for land in the area. In addition, construction of the Kettleman Reservoir is not expected to result in a conversion of the Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to a non-agricultural use. Rather, the Project will provide supplemental water supplies that would help conserve and prevent prime agricultural lands from going out of production due to anticipated SGMA restrictions on groundwater use and/or decreasing reliability of SWP supplies. In addition, agriculturally-important soils would be stockpiled and reused, as described in **Mitigation Measure AG-1**. With or without the mitigation measures enforced, impacts are considered less than significant.

Conveyance Facilities

Construction of conveyance facilities used to divert and convey water from the South Fork of the Kings River to the Project area would be conducted primarily within land classified as Farmland of Statewide Importance, with pockets of land classified as Grazing and Vacant/Undisturbed. Although improvements made to the South Fork Canal and Empire Weir No. 2 would likely be minor, construction activities would be conducted primarily along roads and within surrounding agricultural land. Construction of the Kettleman

Canal would occur almost entirely in land classified as Farmland of Statewide Importance and Grazing land. The easement area for construction activities of these conveyance activities would extend onto adjacent agricultural land also classified as either Farmland of Statewide Importance or Grazing Land. Construction of the Aqueduct Intertie conveyance facilities would occur predominantly on Grazing Land, with smaller areas classified as Prime Farmland, Unique Farmland, and Urban and Built-up Land.

During construction, agricultural production would be temporarily displaced. In areas where the construction corridor would be located within agricultural lands, agriculture would be temporarily precluded for some portion of the construction period. Construction within land used for agricultural production may require the removal of crops, depending on the crop and time of year. Specifically, improvements made to Empire Weir No. 2 would remain localized to the area, which is considered Farmland of Statewide Importance, but would not disrupt ongoing agricultural practices; therefore, this impact is less than significant. Similarly, the construction of the Kettleman Canal would not impact ongoing agricultural practices despite being located on land classified as Farmland of Statewide Importance. The proposed Kettleman Canal would connect to the South Fork Canal on the north, and pass through cultivated lands north of the proposed Kettleman Reservoir to the northern end of the reservoir. The canal would then pass through grazed lands within the proposed Kettleman Reservoir, ultimately connecting to Kettleman Pumping Plant #2. The Kettleman Canal alignment and associated ROW (approximately 300 ft. in width) would be cleared and grubbed prior to construction, and once completed, the ROW would be restored. The area of impact on cultivated lands is estimated to be approximately 44 acres. There are over 1,400 acres of cultivated lands in the Project area, north of the proposed reservoir, and the loss of 44 acres (approximately 3% loss of cultivated acreage) would not be a significant impact on agricultural production, and therefore is considered to be a less than significant impact. The area of impact on grazed lands within the proposed reservoir footprint of approximately 12,000 acres is estimated to be approximately 86 acres. This represents a loss of approximately 1% of grazed acreage, and similar to the portion of the canal north of reservoir, would not be a significant impact on agricultural production.

The three, parallel 144-inch-diameter pipelines connecting the Kettleman Pumping Plant #2 to the California Aqueduct would be constructed directly through an area of Prime Farmland that currently is used to cultivate almonds. The parallel pipeline alignment and associated ROW (approximately 300 ft. in width) would be cleared and grubbed prior to installing the pipelines. Once the pipelines are installed, the ROW would be restored. The area of impact is estimated to be approximately 19 acres where almond trees would be removed during the clearing phase of construction to accommodate the installation of the pipelines. There are over 1,700 acres of almonds trees in the immediate vicinity of the connecting pipeline, and the loss of 19 acres (approximately 1% loss of trees) would not be a significant impact on agricultural production, and therefore is considered to be a less than significant impact.

Construction of conveyance facilities would also involve the removal of topsoil. Heavy equipment (e.g., bulldozers, excavators, dump trucks, flat-bed trucks, front-end loaders) would be used to dig trenches, transport pipe, and off-load excavated materials. Removal of topsoil and use of heavy equipment has the potential to adversely affect long-term soil characteristics and agricultural productivity of this land through compaction or removal of topsoil. Without proper mitigation, removal of topsoil could make the land no longer viable for agricultural production, which would be a significant impact. Implementation of **Mitigation Measure AG-1** would require that topsoil be stockpiled and replaced, reducing this impact to a level that is less than significant with mitigation.

Other Facilities

Construction of the maintenance yard, electrical switchyard and substation, and pumping plants would occur within land classified as Grazing Land and Urban & Built-up Land. While construction of these facilities would result in the minimal loss of agricultural land, these facilities are an approved land use under the County's Zoning Ordinance, Article 4, Agricultural Zoning Districts.

Operations & Maintenance

Storage Facilities

The Kettleman Reservoir would operate and be maintained in land primarily designated as Grazing Land and Farmland of Statewide Importance, along with small portions classified as Confined Animal Agriculture and Non-Agricultural/Non-Vegetation Land. When not in operation, land within the Kettleman Reservoir would continue to be used primarily for dry grazing, and other periodic agricultural use such as the cultivation of annual crops. Operation of the reservoir would not result in a re-classification of current land use. Per the FMMP Guidelines, Prime Farmland, Unique Farmland, and Farmland of Statewide Importance can maintain this FMMP classification if the land has "been used for irrigated agricultural production at some time during the four years prior to the mapping date" (CDOC, 2015b). Because the reservoir would be expected to operate only three out of ten years (based on historical flooding), any disruption to agricultural production would occur periodically and not permanently. As described in *Section 3.7, Geology and Soils*, there is potential for salinization of soils to occur which would adversely affect native plant growth and could inhibit grazing. Mitigations measures to prevent this from happening are described in *Section 3.7, Geology and Soils* and would reduce impacts to less than significant. Thus, no conversion of Farmland of Statewide Importance to non-agricultural use would occur and impacts are considered less than significant.

Conveyance Facilities

Over the long term, agricultural land use in this area would be unaffected by the O&M of the Project's conveyance facilities. Both the Blakeley Canal and Empire Weir No. 2 are currently operating within land classified as Farmland of Statewide Importance and Prime Farmland, and once improvements are completed to these facilities, their operation would not change the classification of surrounding land use. Operations would remain the same as at present and would therefore not result in a conversion of agricultural land to non-agricultural land.

Similarly, once the proposed Kettleman Canal is constructed, operation of the northern portion of the Kettleman Canal (from the South Fork Canal to just north of the Kettleman Reservoir) would not impact land classification in the project area over time as cultivated agriculture would continue on lands immediately adjacent to the new canal (similar to agricultural lands adjacent to the South Fork Canal). The southern portion of the Kettleman Canal (running through the Kettleman Reservoir to the Kettleman Pumping Plant #2) would operate on land almost entirely classified as Farmland of Statewide Importance. When not in operation, land around the pumping plant would continue to be used primarily dry grazing, and periodic agricultural use, which would likely occur seven out of ten years. Similar to the discussion of the storage facilities for this project, per FMMP Guidelines, Statewide Importance can maintain its FMMP classification if the land has "been used for irrigated agricultural production at some time during the four years prior to the mapping date" (CDOC, 2015b). Because operation of the Kettleman Canal is only anticipated to occur in three of ten years, land classified as Farmland of Statewide Importance would not lose this classification. Impacts from the operation of this conveyance facility would be less than significant.

Facilities associated with the Aqueduct Intertie, aside from the parallel pipelines (discussed below), would not impact agricultural land within the project area. Land occupied by the proposed facilities is predominantly classified as Grazing Land, with smaller areas classified as Prime Farmland, Unique Farmland, and Urban and Built-up Land. When not in use, land would resume its typical/current use. Although approximately 19 acres of almond trees would be removed for the operation of the three, parallel 144-inch diameter pipelines, this is approximately 1 percent of the total almond trees within this immediate rea. The removal of these trees would not significantly reduce agricultural productivity enough to result in the reclassification of the land from Prime Farmland to a non-agricultural use and impacts are considered less than significant.

Overall impacts from the operation of the Project's conveyance facilities are considered less than significant.

Other Facilities

The operation of other project facilities, including the maintenance yard, electrical substation, and pumping plants would occur within land classified as Grazing Land and Urban & Built-up Land. Impacts due to the conversion of any agricultural land of importance would be less than significant as grazing land is not considered as an important farmland category and no Prime Farmland, Unique Farmland or Farmland of Statewide Importance exists within the vicinity of these facilities.

Significance Determination before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure AG-1: Manage Topsoil for Conservation

Topsoil removed during project construction shall be stockpiled for later reuse. Soil shall be stored in a clear area of the construction site where it would not have the potential to affect agricultural or biological resources. Stockpiled soil shall be managed (e.g., covered with a tarp or watered regularly) to prevent generation of fugitive dust. Following construction, topsoil shall be restored to all graded areas where grazing may occur post-construction at an appropriate level of compaction and reseeded.

Significance Determination after Mitigation

Less than significant.

Impact AG-2 Conflict with Existing Zoning for Agricultural Use, or a Williamson Act Contract?

Construction

Storage Facilities

All of the land in the proposed Kettleman Reservoir area is under a Williamson Act or FSZ contract, as depicted in **Figure 3.3-2**. The construction of the Kettleman Reservoir would affect 58 parcels of land under a Williamson Act or FSZ contract, totaling 15,414 acres. **Table 3.3-5** summarizes the Williamson Act parcels within the storage facility area that would be temporarily converted to non-agricultural uses during construction of the Project. All Project construction staging would take place within the footprint of the proposed reservoir; therefore, the approximately 12,000 acres comprising the proposed Kettleman Reservoir footprint would likely be disrupted at some point during construction and potentially used to provide staging areas for the construction of the storage facilities. In all cases, construction and/or staging activity impacts would be temporary (lasting only for the construction period).

Construction of the Kettleman Reservoir would temporarily interrupt the status of Williamson Act contracts as no agricultural activities would be able to occur during construction of the storage facilities. However, since the storage facilities would be considered "Compatible Uses" for Williamson Act land as they would be considered "irrigation and flood control facilities" or "public utility and public service structures including electric transmission and distribution substations, gas regulator stations, communications equipment buildings, public service pumping stations, and reservoirs" under the King's County *Implementation Procedures for the California Land Conservation "Williamson" Act of 1965* (KCCDA, 2013). Under these definitions, parcels used for the construction of the storage facilities would maintain their Williamson Act and FSZ contracts. Because, and because no cancellation of Williamson Act contracts would be needed, impacts associated with the construction of other facilities would be less than significant.

Conveyance Facilities

Existing diversion and conveyance facilities, including the Empire Weir No. 2, the South Fork Canal, and the Blakely Canal, are located on land under Williamson Act and/or FSZ contracts. Therefore, since this infrastructure already exists, there would be no re-categorization of land use or cancellation of a Williamson Act contract, as the Project plans to take utilize existing conveyance structures in the area. Improvements made to Empire Weir No. 2 and the South Fork Canal would be confined to the existing area surrounding the facilities, with a ROW on either side. The use of this land for construction-related activities would be limited only to the construction period, after which land use can return to its current use and would not require the cancellation of a Williamson Act contract. The anticipated construction period of two to three years is only a fraction of the contract's 10-year life span. Loss of agricultural productivity during construction activity on these lands would not warrant a cancellation of a Williamson Act contract.

Similarly, the construction of new conveyance facilities, including the Kettleman Canal and Aqueduct Intertie, would occur on land under Williamson Act contracts. Construction of these facilities and their associated staging areas may temporarily preclude agricultural activity during the construction period; however, the construction activity would be temporary and therefore would not affect the status of contracted Williamson Act land and no cancellations would occur due to this activity. The new canal and pipelines constructed as part of the Project would remove approximately one percent of existing land from agricultural production; however, the new facilities would be used for the movement and storage of water, and these facilities are considered to be "Compatible Uses" for Williamson Act land as they would be considered "irrigation and flood control facilities" or "public utility and public service structures". As such, impacts associated with construction of the proposed new conveyance facilities would be less than significant.

Other Facilities

The land used for the construction of the maintenance yard, pumping plants, and electrical substation are under Williamson Act and FSZ contracts. Construction of these facilities would temporarily interrupt the status of Williamson Act contracts during the construction period as no agricultural activities would be able to occur during construction of these Project elements. However, other facilities constructed would be considered "Compatible Uses" for Williamson Act land as they would be considered "irrigation and flood control facilities" or "public utility and public service structures including electric transmission and distribution substations, gas regulator stations, communications equipment buildings, public service pumping stations, and reservoirs" under the King's County *Implementation Procedures for the California Land Conservation "Williamson" Act of 1965* (KCCDA, 2013). Under this definition, parcels used for the construction of other facilities would maintain their Williamson Act and FSZ contracts. Because no cancellation of Williamson Act contracts would be needed, impacts associated with the construction of other facilities would be less than significant.

Table 3.3-5: Williamson Act Parcels Impacted by Proposed Project

Parcel APN	Acres
036220001000	613
036220008000	611
036210030000	412
036210032000	642
036210013000	156
036210031000	635
036120044000	439
036110021000	642
042340004000	5
042340041000	1
042340024000	2
042340005000	2
042230048000	0.02
042180001000	646
042180023000	5
042180016000	3
042150016000	319
042150028000	215
042150018000	103
042150012000	301
042150020000	17
042150040000	1709
042150026000	36
042100004000	65
042100018000	3
042100029000	73
042100028000	39
042100026000	18
042100016000	1
042100005000	3
042100100000	327
042100099000	112
042100068000	644
042100030000	0
042100069000	134
042100070000	40
042090014000	633
042090001000	642
042030001000	628
042030012000	631
042010010000	301
042010009000	569
042010011000	325
042010015000	102
042010016000	4

Parcel APN	Acres
042010018000	319
042150054000	128
042150014000	149
042100007000	14
042100031000	15
042100032000	34
042100017000	56
042100006000	1
042100073000	398
042100027000	211
042010035000	107
042010039000	537
042010017000	636
Total Affected Acres	**15,414**

Operations & Maintenance

Storage Facilities

The Kettleman Reservoir would overlie 58 land parcels under Williamson Act contracts. When not in operation (anticipated to be seven out of ten years), the Project's land would be used for grazing or remain fallowed. These activities are consistent with Williamson Act requirements which assert that land must be used for commercial agricultural uses, including "grazing and feeding of sheep, goats, horses, mules, swine, bovine animals, and other similar domesticated quadrupeds" (KCCDA, 2013). During Project operations, the land would be converted to shallow aquatic and riparian habitat when flooded, which is anticipated to occur for up to approximately 140 days, three out of every ten years. The flooding of these land parcels would not lead to the termination of Williamson Act contracts within the Project area as these operations would only preclude agricultural operations intermittently (in a manner similar that of existing flooding of agricultural lands) and not long enough to lead to cancellation of a contract (which lasts for ten years). Additionally, the use of these parcels as a flood control and storage reservoir is consistent with Williamson Act criteria as a compatible use (i.e. the use of land for "irrigation and flood control facilities; public utility and public service structures including electric transmission and distribution substations, gas regulator stations, communications equipment buildings, public service pumping stations, and reservoirs" and as "public uses of administrative, public service or cultural type, including…parks…" [KCCDA, 2013]). Therefore, land within the Kettleman Reservoir would maintain Williamson Act status both in operation (when flooded) and not in operation (grazing). As such, impacts associated with the operation of the reservoir would be less than significant as the status of current Williamson Act contracts would not be affected.

Conveyance Facilities

Existing conveyance facilities (Empire Weir No. 2 and the South Fork Canal) are currently Williamson Act contracted lands. Anticipated Project facility operations and maintenance activities would not materially change how these facilities operate and would have no effect on the parcels' Williamson Act status. For new conveyance facilities, once in operation, these facilities would serve as "irrigation and flood control facilities" and "public utility and public service structures," which are considered compatible uses for Williamson Act land. This operational categorization as irrigation/flood control facilities would allow the land owner to maintain the Williamson Act contract. No contracts would be terminated due to the operation of the conveyance facilities; therefore, impacts are less than significant.

Other Facilities

The O&M of the maintenance yard, pumping plants, and electrical switchyard and substation would not require the cancellation of Williamson Act Contracts, as little agricultural activities currently exist on these parcels and the facilities are considered compatible uses for land under Williamson Act land. Although the maintenance yard would be located on an existing strip of land that is currently clear of agricultural production, one parcel of land is contracted under Williamson Act (or FSZ) land. However, this one parcel represents a very small number of parcels relative to all Williamson Act or FSZ parcels in the County, and therefore this impact is considered to be less than significant.

The other facilities (pumping plants and switchyard/substation) are considered "Compatible Uses" for Williamson Act land as they would be considered "irrigation and flood control facilities" or "public utility and public service structures including electric transmission and distribution substations, gas regulator stations, communications equipment buildings, public service pumping stations, and reservoirs" under the King's County *Implementation Procedures for the California Land Conservation "Williamson" Act of 1965* (KCCDA, 2013). Under this definition, parcels for facilities other than the maintenance yard would maintain their Williamson Act and FSZ contracts. Since no cancellation of Williamson Act contracts would arise, impacts associated with the construction of other facilities would be less than significant.

Significance Determination before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation measures are required.

Impact AG-3 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?

Construction, Operations & Maintenance

All Facilities

None of the activities involved in construction or operation of the Project is expected to encourage conversion of adjacent or nearby farmland to non-agricultural use, and there is no forest land in the Project area. The improvements in water supply reliability afforded by the Project would encourage preservation of agricultural land and help agricultural lands from going out of production in the future.

Ongoing conversion of farmland to non-agricultural uses is a regional problem. In 2007, 76,322 acres of agricultural land were fallowed due to lack of availability of surface water and insufficient quantities of groundwater (Kings County, 2009). Per DWR's *Draft State Water Project Delivery Capability Report* (2015), a 38 percent reduction in surface water deliveries to Semitropic have led to increased groundwater extraction and resulted in declining groundwater levels in the basin underlying Semitropic. This trend in reduced SWP deliveries is also similar to trends seen in other parts of the San Joaquin Valley. The proposed Project would combat this instability by increasing the reliability of water supplies in the San Joaquin Valley by establishing a reliable, long-term water supply of up to 120,000 AFY average-annual of floodwater. This reliability would also prevent additional farmland from being converted to non-agricultural uses (by being fallowed) which thereby supports regional economic sustainability. By providing a reliable source of water, the Project would reduce the potential for future conversions of farmland to non-agricultural use as a result of insufficient water supplies, particularly in light of SGMA's regulation and potential restrictions on groundwater use. The Project would address the shortage in water supply within Semitropic and possibly other agricultural areas in Kern and Kings Counties, and would also offset potentially related adverse effects from increase groundwater pumping (e.g., overdraft, subsidence,

groundwater quality issues) that have occurred and would likely continue to occur with the absence of an alternative water supply.

The capture and storage of floodwaters in the Kettleman Reservoir aligns with the *Kings County General Plan - Land Use Goal B6.2* which encourages to "identify agricultural areas that may serve as emergency floodwater storage or drainage areas" and *Land Use Objective B6.2.1* which states that "flood zones within the General Agricultural designations shall be considered appropriate land use areas that have the potential to receive emergency floodwater" (Kings County, 2010f). In operation, the Kettleman Reservoir would utilize agricultural land to store floodwaters that may otherwise impact nearby cities and farmlands. The Project reduces flood risks to other areas while capturing additional water supplies for storage and later reuse or banking. Therefore, impacts are considered less than significant.

Significance Determination before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation measures are required.

Cumulative Impacts

The geographic scope of cumulative impacts on agricultural resources encompasses the Project area, which includes the portion of Kings County within the vicinity of Kettleman City. Several relevant present and future projects are under construction or in the planning phase that are in proximity to the proposed Project, including:

- Quay Valley Community Development - a new 7,175-acre community to be developed in south Kings County.
- Kettleman Hills Facility Expansion - expanding the existing B-18 Landfill and construct a new B-20 Landfill for hazardous waste and designated waste disposal.
- Kettleman City Surface Water Treatment Plant and Commercial Water Storage Tanks (Treatment Plant) – construction of a new surface water treatment plant to treat surface water for potable supply.
- Southwest Groundwater Banking Project – development of a project to divert and store floodwater from the Kings River and local stormwater.
- JID Distributed Recharge Bypass and Lassen Projects – improvement to and construction of recharge facilities to divert and store floodwater from the Kings River.
- Terranova On-Farm Flood Capture and McMullin Recharge Site – improvements to and construction of facilities to divert floodwater from the Kings River for recharge on existing farm lands.

Of these six projects, only the development of the Quay Valley Community would have the potential to adversely affect agricultural resources by converting farmland to non-agricultural use. While the majority of land in Kings County is used for agricultural use (over 90 percent), documentation available for the other three projects indicates that there are no apparent impacts associated with their construction or operation (Kings County, 2010f). The 2011 Mitigated Negative Declaration (MND) for the Kettleman City Surface Water Treatment Plant concluded that there are no agricultural impacts associated with the construction of this project as no project sites are located on important farmland or on land under a Williamson Act contract (KCCDA, 2011). The 2013 Addendum for the expansion of the Kettleman Hills Facility found that the project would not affect any parcel under a Williamson Act contract and would not impact off-site

agricultural operations (DTSC, 2013). Although the Southwest Groundwater Banking Project would be located on previously disturbed farmland and landowners have voiced concerned about canals running through their farmland, the Memorandum of Understanding that exists for the project stresses that minimal impacts to agricultural land are expected to be associated with this project and the project's Environmental Assessment notes that the additional groundwater supplies resulting from the project would "…be available to support agricultural resources" and that the "…Proposed Action would be compatible with the goal of protected agricultural resources through the beneficial use of percolation basins, and would reduce the potential for agricultural lands to be converted to residential, commercial, or other non-agricultural uses including fallowing" (USBR, 2017).

However, the development of the Quay Valley Community would result in the conversion of 1,700 acres of Prime Farmland to various urban uses (including commercial and residential) and 1,967 acres are in the process of non-renewal under the Williamson Act (Kings County, 2016). Over 200 acres of permanent agriculture, in the form of orchards, vineyards, and community gardens, is planned, along with an addition 250 acres reserved as agricultural buffer zones (Kings County, 2016); however, the majority of farmland at the project site would be converted from agricultural use to build homes, offices, and recreational elements for the community.

Ongoing conversion of farmland to non-agricultural uses is a regional problem throughout Kings County and is considered a significant impact. As described in the impact discussions above, the proposed Project generally supports agriculture and would not lead to farmland conversion. As such, the project would not result in a cumulatively considerable contribution to loss of agricultural land and the cumulative impact is thus considered less than significant.

3.4 Air Quality

This section provides an overview of the existing air quality at the Project site and surrounding region, the regulatory framework, an analysis of potential impacts to regional and local air quality that may result from implementation of the proposed Project, and identification of mitigation measures to reduce potential impacts. Both temporary impacts related to construction and long-term impacts associated with Project operations are discussed.

3.4.1 Environmental Setting

Local Climate and Meteorology

The Project site is in the San Joaquin Valley Air Basin (SJVAB), which is defined by the Sierra Nevada mountains in the east (averaging 8,000 to 14,000 feet in elevation), the Coast Ranges in the west (averaging 3,000 feet in elevation), and the Tehachapi mountains in the south (averaging 6,000 to 8,000 feet in elevation). The San Joaquin Valley (SJV) is flat, with a slight downward gradient to the northwest, and opens to the sea at the Carquinez Strait, where the San Joaquin-Sacramento Delta empties into San Francisco Bay.

Although marine air generally flows into the SJVAB from the San Joaquin River Delta, the region's topographic features restrict air movement through and out of the SJVAB. The Coastal Range hinders wind access into the SJV from the west, the Tehachapi range prevents southerly passage of airflow, and the high Sierra Nevada range is a significant barrier to the east. These topographic features result in weak airflow, which becomes blocked vertically by high barometric pressure over the SJV. Consequently, the SJVAB is highly susceptible to air pollutant accumulation over time.

Air pollutant emissions in the SJVAB are generated by stationary and mobile sources. Stationary sources can be divided into two major subcategories: point and area sources. Point sources occur at a specific location and are often identified by an exhaust vent or stack. Examples include boilers or combustion equipment that produce electricity or generate heat. Area sources are widely distributed and include such sources as residential and commercial water heaters, painting operations, lawn mowers, agricultural fields, landfills, and some consumer products. Mobile sources refer to emissions from motor vehicles, including tailpipe and evaporative emissions, and are classified as either on-road or off-road. On-road sources may be legally operated on roadways and highways. Off-road sources include aircraft, ships, trains, and self-propelled construction equipment. Air pollutants can also be generated by the natural environment, such as when high winds suspend fine dust particles.

Air Pollutants of Primary Concern

The federal and State Clean Air Acts mandate the control and reduction of certain air pollutants. Under these Acts, the U.S. Environmental Protection Agency (USEPA) and the California Air Resources Board (CARB) have established ambient air quality standards for certain "criteria" pollutants. Ambient air pollutant concentrations are affected by the rates and distributions of corresponding air pollutant emissions, as well as by the climate and topographic influences discussed above. The primary determinant of concentrations of non-reactive pollutants (such as carbon monoxide [CO] and suspended particulate matter) is proximity to major sources. In particular, ambient CO levels usually closely follow the spatial and temporal distributions of vehicular traffic. A discussion of primary criteria pollutants is provided below.

Ozone

Ozone (O_3) is produced by a photochemical reaction (triggered by sunlight) between nitrogen oxides (NO_X) and reactive organic gases (ROG). NO_X is formed during the combustion of fuels, while reactive organic gases are formed during combustion and evaporation of organic solvents. Because ozone requires sunlight

to form, it mostly occurs in substantial concentrations between the months of April and October. Ozone is a pungent, colorless, toxic gas with direct health effects on humans including respiratory and eye irritation as well as possible changes in lung functions. Groups most sensitive to ozone include children, the elderly, people with respiratory disorders, and people who exercise strenuously outdoors.

Carbon Monoxide

Carbon monoxide is a local pollutant that is found in high concentrations only near fuel combustion equipment and other sources of CO. The primary source of CO, a colorless, odorless, poisonous gas, is automobile traffic. Elevated concentrations, therefore, are usually only found near areas of high traffic volumes. The health effects of CO are related to its affinity for hemoglobin in the blood. At high concentrations, CO reduces the amount of oxygen in the blood, causing heart difficulty in people with chronic diseases, reduced lung capacity, and impaired mental abilities.

Nitrogen Dioxide

Nitrogen dioxide (NO_2) is a by-product of fuel combustion, with the primary source being motor vehicles and industrial boilers and furnaces. The principal form of nitrogen oxide produced by combustion is nitric oxide (NO), but NO reacts rapidly to form NO_2, creating the mixture of NO and NO_2 commonly called NO_X. NO_2 is an acute irritant. A relationship between NO_2 and chronic pulmonary fibrosis may exist, and an increase in bronchitis in young children at concentrations below 0.3 parts per million (ppm) may occur. NO_2 absorbs blue light and causes a reddish-brown cast to the atmosphere and reduced visibility. It can also contribute to the formation of PM_{10} and acid rain.

Suspended Particulates

Atmospheric particulate matter comprises finely divided solids and liquids such as dust, soot, aerosols, fumes, and mists. The particulates that are of particular concern are PM_{10} (which measures no more than 10 microns in diameter) and $PM_{2.5}$ (a fine particulate measuring no more than 2.5 microns in diameter). The characteristics, sources, and potential health effects associated with the small particulates (those between 2.5 and 10 microns in diameter) and $PM_{2.5}$ can be different. Major man-made sources of PM_{10} are agricultural operations, industrial processes, combustion of fossil fuels, construction, demolition operations, and entrainment of road dust into the atmosphere. Natural sources include windblown dust, wildfire smoke, and sea spray salt. The finer $PM_{2.5}$ particulates are generally associated with combustion processes as well as being formed in the atmosphere as a secondary pollutant through chemical reactions. $PM_{2.5}$ is more likely to penetrate deeply into the lungs and poses a serious health threat to all groups, but particularly to the elderly, children, and those with respiratory problems. More than half of the small and fine particulate matter that is inhaled into the lungs remains there, which can cause permanent lung damage. These materials can damage health by interfering with the body's mechanisms for clearing the respiratory tract or by acting as carriers of an absorbed toxic substance.

Current Ambient Air Quality

CARB and the USEPA establish ambient air quality standards for major pollutants at levels intended to protect public health. Federal and State standards have been established for ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead, and fine particulates (PM_{10} and $PM_{2.5}$). Standards have been set at levels intended to be protective of public health. California standards are typically more restrictive than federal standards.

Local air districts and CARB monitor ambient air quality to assure that air quality standards are met, and if they are not met, to also develop strategies to meet the standards. Air quality monitoring stations measure pollutant ground-level concentrations (typically 10 feet above ground level). Depending on whether the standards are met or exceeded, the SJVAB is classified as in "attainment" or "non-attainment." Some areas

are unclassified, which means no monitoring data are available. Unclassified areas are considered to be in attainment. The proposed Project is located within the jurisdiction of the San Joaquin Valley Air Pollution Control District (SJVAPCD). SJVAPCD is currently in non-attainment for State and federal ozone and $PM_{2.5}$ as well as State PM_{10} (CARB, 2016a). **Table 3.4-1** lists the current federal and State standards for regulated pollutants.

Table 3.4-1: Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Primary Standards	California Standard
Ozone	1-Hour	---	0.09 ppm
	8-Hour	0.070 ppm	0.070 ppm
Carbon Monoxide	8-Hour	9.0 ppm	9.0 ppm
	1-Hour	35.0 ppm	20.0 ppm
Nitrogen Dioxide	Annual	0.053 ppm	0.030 ppm
	1-Hour	0.100 ppm	0.18 ppm
Sulfur Dioxide	Annual	---	---
	24-Hour	---	0.04 ppm
	1-Hour	0.075 ppm	0.25 ppm
PM_{10}	Annual	---	20 $\mu g/m^3$
	24-Hour	150 $\mu g/m^3$	50 $\mu g/m^3$
PM_{25}	Annual	12 $\mu g/m^3$	12 $\mu g/m^3$
	24-Hour	35 $\mu g/m^3$	---
Lead	30-Day Average	---	1.5 $\mu g/m^3$
	3-Month Average	0.15 $\mu g/m^3$	---

Notes:
ppm = parts per million
$\mu g/m^3$ = micrograms per cubic meter
Source: CARB, 2016b.

The Hanford-S Irwin Street Monitoring Station is the only SJVAPCD-operated monitoring station located in Kings County and is approximately 18 miles north of the Project site. **Table 3.4-2** summarizes the representative annual air quality data for the Project site between the years 2014 and 2016 at the Hanford-S Irwin Street Monitoring Station for all criteria pollutants.

Table 3.4-2: Ambient Air Quality at the Nearest Monitoring Stations

Pollutant	2014	2015	2016
Ozone (ppm), Worst 1-Hour	0.108	0.119	0.097
Number of days of State exceedances (>0.09 ppm)	5	4	2
Ozone (ppm), 8-Hour Average	0.094	0.094	0.088
Number of days of State exceedances (>0.07 ppm)	40	46	53
Number of days of federal exceedances (>0.07 ppm)	39	42	49
Nitrogen dioxide (ppm), Worst 1-hour	0.050	0.051	0.052
Number of days of State exceedances (>0.25 ppm)	0	0	0
Number of days of federal exceedances (>0.075 ppm)	0	0	0
Particulate matter <10 microns, $\mu g/m^3$, Worst 24 Hours	131.3	136.9	82.6
Number of days above State standard (>50 $\mu g/m^3$)	22	17	9
Number of days above federal standard (>150 $\mu g/m^3$)	1	0	0
Particulate matter <2.5 microns, $\mu g/m^3$, Worst 24 Hours	96.7	98.2	43.2
Number of days above federal standard (>35 $\mu g/m^3$)	30	25	11

Notes:
ppm = parts per million, $\mu g/m^3$ = micrograms per cubic meter
* There was insufficient (or no) data available to determine the value.
Hanford-S Irwin Street Monitoring Station was used for all pollutants. State and federal statistics may differ for the following reasons: (1) National 8-hour averages are truncated to three decimal places, State 8-hour averages are rounded to three decimal places, and/or (2) State criteria for ensuring that data are sufficiently complete for calculating 8-hour averages are more stringent than the national criteria.
Source: CARB, 2017.

Sensitive Receptors

Ambient air quality standards have been established to represent the levels of air quality considered sufficient, with an adequate margin of safety, to protect public health and welfare. They are designed to protect people most susceptible to respiratory distress, such as children under 14, persons over 65, persons engaged in strenuous work or exercise, and people with cardiovascular and chronic respiratory diseases. SJVAPCD identifies sensitive receptor locations as schools, parks and playgrounds, day care centers, nursing homes, hospitals, and residential dwelling units. The nearest sensitive receptors identified are nine residences located between 200 and 800 feet from Blakeley Canal at the northern end of the Project area boundary. No other sensitive receptors were identified within 1,000 feet of the Project site boundary.

3.4.2 Regulatory Framework

The Federal Clean Air Act (FCAA) governs air quality in the United States. In addition to being subject to federal requirements, air quality in California is also governed by more stringent regulations under the California Clean Air Act (CAA). These laws are administered by CARB at the State level and by SJVAPCD at the regional and local levels.

Federal

U.S. Environmental Protection Agency

The U.S. Environmental Protection Agency (USEPA) is responsible for enforcing the FCAA. The USEPA is also responsible for establishing the National Ambient Air Quality Standards (NAAQS), which are shown in **Table 3.4-1**. The NAAQS are required under the 1977 FCAA and subsequent amendments. The USEPA regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain types of locomotives, has jurisdiction over emission sources outside state waters (i.e., beyond the outer continental shelf), and establishes various emission standards, including those for vehicles sold in states other than California. Automobiles sold in California must meet the stricter emission standards established by CARB.

State

California Air Resources Board

In California, the California Air Resource Board (CARB), which became part of the California Environmental Protection Agency in 1991, is responsible for meeting the State requirements of the FCAA, administering the California CAA, and establishing the California Ambient Air Quality Standards (CAAQS). The California CAA, as amended in 1992, requires all air districts in the state to endeavor to achieve and maintain the CAAQS. The CAAQS are generally more stringent than the corresponding federal standards and incorporate additional standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles (**Table 3.4-1**). The CARB regulates mobile air pollution sources, such as motor vehicles. The agency is responsible for setting emission standards for vehicles sold in California and for other emission sources, such as consumer products and certain off-road equipment. The CARB established passenger vehicle fuel specifications, which became effective on March 1996, and oversees the functions of local air pollution control districts and air quality management districts, which in turn administer air quality activities at the regional and county level.

Regional

San Joaquin Valley Air Pollution Control District

The San Joaquin Valley Air Pollution Control District (SJVAPCD) is primarily responsible for assuring that the federal and State ambient air quality standards are attained and maintained in the San Joaquin Valley. Under State law, the SJVAPCD is required to prepare a plan for air quality improvement for pollutants for which the basin is in non-compliance. SJVAPCD has adopted numerous attainment plans to reduce ozone and particulate precursor emissions since 1992. Most recently, SJVAPCD adopted the 2016 Ozone Plan to bring SJV into attainment of the federal 2008 8-hour ozone standard by December 31, 2031. The Ozone Plan describes a comprehensive stationary and mobile source control strategy to reduce NO_X emissions by over 60 percent between 2012 and 2031.

SJVAPCD is currently preparing the 2017 $PM_{2.5}$ Plan as a single comprehensive attainment plan that addresses multiple $PM_{2.5}$ standards under the FCAA. Most recently, SJVAPCD adopted the 2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard, which addresses the USEPA federal annual $PM_{2.5}$ standard of 12 $\mu g/m^3$ established in 2012. The Moderate Area Plan addresses the fact that attainment of the 2012 $PM_{2.5}$ standard by 2021 is impracticable and is physically impossible given that critical mobile source regulations, such as CARB truck and bus regulation and off-road engine regulation, will not be fully implemented until 2023. The Moderate Area Plan also requests reclassification of the region to Serious Non-attainment with a new attainment deadline of 2025.

3.4.3 Impact Analysis

Methodology for Analysis

This air quality analysis conforms to the methodologies recommended in the SJVAPCD's *Guidance for Assessing and Mitigating Air Quality Impacts*. The guidance document includes thresholds for emissions associated with both construction and operation of the proposed Project.

Project construction would generate diesel emissions and dust. Construction of the proposed Project would involve large amounts of grading that would require use of construction equipment that may generate criteria air pollutants. Detailed construction schedules and grading estimates are summarized in **Table 3.4-3**.

Table 3.4-3: Construction Summary

Construction Schedule	Duration (days)	Disturbance Area (acres)	Grading – Cut (cubic yards)	Grading – Compacted Fill (cubic yards)
Schedule A: Aqueduct Intertie Turnout	395	2	16,300	10,800
Schedule B: Kettleman Pumping Plant #2	1,361	7	20,700	14,300
Schedule C: Aqueduct Intertie Pipelines	1,204	91	668,800	443,100
Schedule D: Kettleman Reservoir Facilities	1,131	2,644	10,893,000	8,379,300
Schedule E: Kings River South Fork Bifurcation	421	Within Schedule G	18,000	2,600
Schedule F: Kettleman Pumping Plant #1	652	Within Schedule G	25,700	2,200
Schedule G: Kettleman Canal	1,051	433	2,211,900	1,434,400
Schedule H: Empire Weir No. 2 Improvements	461	2	2,000	500
Schedule I: PG&E System Improvements	142	1	260	80

Construction emissions were calculated using the California Emissions Estimator Model (CalEEMod) software version 2016.3.1. CalEEMod is the SJVAPCD-recommended program to estimate anticipated emissions associated with projects in California. The CalEEMod has separate databases for specific counties and air districts. In this regard, the Kings County-San Joaquin database was used for this proposed Project. Construction is scheduled to occur over a three- to five-year period. Each construction schedule was modeled as a separate CalEEMod run, and each construction schedule included multiple components, as described below:

- **Schedule A (Aqueduct Intertie Turnout)**: Install cofferdam, excavation, concrete/mechanical, backfill, 120-inch piping, remove cofferdam, control building, onsite electrical, site grading/surfacing/fence, and offsite O/H electrical.
- **Schedule B (Kettleman Pumping Plant #2)**: Excavation, concrete/mechanical, backfill, maintenance building, onsite electrical, onsite substation, site grading/surfacing/fence, standpipe, and groundwater impacts.

- **Schedule C (Aqueduct Intertie Pipelines)**: Excavation, pipeline installation, and backfill (assuming subsurface installation).
- **Schedule D (Kettleman Reservoir Facilities)**: Levee construction, reservoir structures, onsite electrical, site grading/surfacing/fence, offsite electrical, reservoir pipelines, and rock access roads.
- **Schedule E (Kings River South Fork Bifurcation)**: Weir excavation, weir concrete/mechanical, weir backfill, canal improvements, and modify crossings/outlets.
- **Schedule F (Kettleman Pumping Plant #1)**: Excavation, concrete/mechanical, backfill, site grading/surfacing/fence, standpipe, and groundwater impacts.
- **Schedule G (Kettleman Canal)**: Canal construction and groundwater impacts.
- **Schedule H (Empire Weir No. 2 Improvements)**: Cofferdam installation, weir excavation, weir concrete/mechanical, and backfill.
- **Schedule I (PG&E System Improvements)**: Offsite O/H electrical, switchyard/substation.

The number of days for each component, along with construction equipment lists detailing the horsepower, engine tier (primarily Tier 3 and Tier 4 equipment), and hours of expected usage.

As shown in **Table 3.4-3**, the Project would result in a balance to spoil based on the cut and fill. However, it is anticipated that all soil materials would be managed onsite as a balanced "cut-and-fill" operation. The remaining soil would be pushed out to the edges of the cells used for the levees, pumping plant earthen pads, etc. In addition, construction water would be hauled in via water trucks to water the site twice a day for dust control. Water trucks would fill up at a fire hydrant in Kettleman City, approximately 10 miles from the site. Worker trips were also assumed to be approximately 10 miles from the city to the Project site. Complete CalEEMod assumptions and results are contained in Appendix B.

Table 3.4-4 summarizes the construction equipment for the Project.

Table 3.4-4 Construction Equipment

Equipment Type	Model (Year)	Horsepower	Engine Tier
Excavators	CAT 374 (2016) CAT 349 (2016) CAT 336 (2016)	472 417 303	4 4 4
Trenchers	Cleve 400W (2005)	200	2
Backhoes	CAT 420 (2016)	436	4
Dozers	CAT D9T (2016) CAT D8T (2016) CAT D6N (2016)	436 312 166	4 4 4
Compactors	825K (2016) CAT 815 (2016)	405 248	4 4
Motor Graders	CAT 14M (2016)	259	4
Loaders	CAT 962M (2016)	250	4
Scrapers	CAT 637G (2016)	500	4
Sidebooms	CAT 572R (2010)	240	3
Cranes	TerexHC230 (2016) TerexRT780	300 260	3 4
Boom Trucks	Sterling 7500 (2016)	250	N/A
Water Trucks	Peterbilt 348 (2015)	300	N/A
Fuel Trucks	Peterbilt 348 (2015)	300	N/A
Gang Trucks	Dodge 5500 (2015)	300	N/A
PU Trucks	Ford F250 (2015)	300	N/A
Air Compressors	IR 185 (2015)	50	N/A
Line Trucks	Sterling 7500 (2015)	250	N/A
Bucket Trucks	Sterling 7500 (2015)	250	N/A
Bore Rigs	Bore Rig (2015)	300	3
Drill Rig	Drill Rig (2015)	400	3
Forklifts	RT Forklift (2016)	100	4

Thresholds of Significance

According to Appendix G of the *State CEQA Guidelines*, air quality impacts related to the Project would be considered significant if the Project would:

- Violate any air quality standard or contribute substantially to an existing or projected air quality violation or result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations;
- Create objectionable odors affecting a substantial number of people; and/or
- Conflict with or obstruct implementation of the applicable air quality plan.

The SJVAPCD has developed specific quantitative thresholds that apply to projects in the SJVAB. These thresholds are designed to achieve attainment of federal and State ambient air quality standards at a regional level. Thus, individual projects with emissions below threshold levels would not contribute significantly to cumulative air quality impacts in the air district. The SJVAPCD recommends the following quantitative regional significance thresholds for temporary construction activities and long-term project operation in the SJVAB (SJVAPCD, 2015):

Construction Thresholds
100 tons per year of CO
10 tons per year of NO_X
10 tons per year of ROG
27 tons per year of SO_X
15 tons per year of PM_{10}
15 tons per year of $PM_{2.5}$

Operational Thresholds
100 tons per year of CO
10 tons per year of NO_X
10 tons per year of ROG
27 tons per year of SO_X
15 tons per year of PM_{10}
15 tons per year of $PM_{2.5}$

Regulatory Requirements

The Project would be required to comply with all applicable regulatory standards. In particular, the proposed Project would comply with SJVAPCD Regulation VIII, Control Measures for Construction Emissions of PM_{10}:

- All disturbed areas, including storage piles, which are not being actively utilized for construction purposes shall be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, covered with a tarp or other suitable cover or vegetative ground cover.
- All onsite unpaved roads and offsite unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.
- All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking.
- With the demolition of buildings up to six stories in height, all exterior surfaces of the building shall be wetted during demolition.

- When materials are transported offsite, all material shall be covered, or effectively wetted to limit visible dust emissions, and at least six inches of freeboard space from the top of the container shall be maintained.
- All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each workday.
- Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions utilizing sufficient water or chemical stabilizer/suppressant.
- In urban areas, trackout shall be immediately removed when it extends 50 or more feet from the site and at the end of each workday.
- An owner/operator of any site with 150 or more vehicle trips per day, or 20 or more vehicle trips per day by vehicles with three or more axles shall implement measures to prevent carryout and trackout.

Impacts and Mitigation Measures

Impact AIR-1 Violate any air quality standard or contribute substantially to an existing or projected air quality violation or result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard

Construction

All Facilities

Construction-related emissions arise from a variety of activities including (1) grading, excavation, and other earth moving activities; (2) travel by construction equipment and employee vehicles, especially on unpaved surfaces; (3) exhaust from construction equipment; and (4) asphalt paving. PM_{10} and $PM_{.25}$ emissions from construction would vary greatly from day to day depending on the level of activity, the equipment being operated, silt content of the soil, and the prevailing weather. Construction would consist of grading of the Project area and development of the water storage and conveyance facilities. These activities would generate temporary air pollutant emissions, including fugitive dust (PM_{10} and $PM_{2.5}$) and exhaust emissions from heavy construction vehicles and soil hauling trucks. Construction emissions were modeled using CalEEMod, and are summarized below in **Table 3.4-5.**

As shown in **Table 3.4-5**, emissions for CO, NO_X, ROG, PM_{10}, and $PM_{2.5}$ would exceed SJVAPCD annual thresholds. For NO_X and PM_{10}, the identified exceedances would only occur during 2018, 2019, and 2020. CO and ROG would exceed annual thresholds for 2019 and 2020, $PM_{2.5}$ would exceed annual thresholds for 2020. The identified exceedances would primarily be associated with construction of the Kettleman Reservoir facilities, which is the largest component of the Project. The Project would implement construction Best Management Practices (BMPs), including watering active portions of the site twice daily and using Tier 3 and Tier 4 construction equipment. These components of the Project were incorporated into the CalEEMod emissions estimates for the Project. However, as shown in **Table 3.4-5**, the Project would still exceed the SJVAPCD's construction emissions thresholds. Therefore, construction emissions would be potentially significant.

Table 3.4-5 Estimated Construction Emissions for Criteria Pollutants (tons/year)

Schedule	A	B	C	D	E	F	G	H	I	Total	Threshold	Exceeded?
CO												
2018		5.59	1.51	3.46	27.47		11.00			**46.02**	100	No
2019	2.31	9.98	37.13	7.42	34.65	30.65	36.95	2.25	0.16	**161.50**	100	**Yes**
2020	3.07	9.07	11.00	77.76	6.76	84.24	5.70	4.42	0.85	**202.88**	100	**Yes**
NO_x												
2018		7.65	1.72	5.47	33.75		13.34			**61.94**	10	**Yes**
2019	2.25	13.26	45.34	10.46	45.14	41.57	45.46	2.63	0.11	**206.22**	10	**Yes**
2020	3.86	11.25	13.20	101.18	8.91	117.22	5.44	4.91	0.57	**266.54**	10	**Yes**
ROG												
2018		0.84	0.19	0.3	4.09		1.44			**6.86**	10	No
2019	0.25	1.48	4.92	0.68	5.25	4.76	4.88	0.32	0.02	**22.59**	10	**Yes**
2020	0.45	1.28	1.39	11.09	1.00	13.14	0.49	0.59	0.10	**29.52**	10	**Yes**
SO_x												
2018		0.01	0.00	0.01	0.10		0.04			**0.18**	27	No
2019	0.00	0.03	0.12	0.03	0.14	0.13	0.14	0.01	0.00	**0.60**	27	No
2020	0.01	0.03	0.04	0.36	0.03	0.38	0.02	0.01	0.00	**0.86**	27	No

Schedule	A	B	C	D	E	F	G	H	I	Total	Threshold	Exceeded?
PM_{10}												
2018		0.52	0.75	10.58	6.07		3.18			**21.09**	15	**Yes**
2019	0.20	0.91	6.56	11.10	7.85	7.04	8.60	0.20	0.01	**42.47**	15	**Yes**
2020	0.26	0.78	2.72	29.83	1.69	19.16	2.26	0.36	0.39	**57.46**	15	**Yes**
$PM_{2.5}$												
2018		0.37	0.34	1.65	1.88		1.09			**5.32**	15	No
2019	0.14	0.62	2.78	1.936	2.52	2.27	2.97	0.15	0.01	**13.38**	15	No
2020	0.20	0.50	1.22	7.59	0.52	6.38	0.92	0.26	0.03	**17.62**	15	**Yes**

Notes: Numbers may not add due to rounding. All calculations were estimated using CalEEMod. Appendix B includes calculations.

Operations and Maintenance

All Facilities

Operational emissions are long-term emissions associated with operation of the Project, and would result from area, energy, and mobile sources. The Project would use electricity to pump water. However, the Project would be connected to the electricity grid and operation of the pumps would use electricity generated offsite and supplied by Pacific Gas and Electric Company (PG&E). Although consumption of electricity may indirectly result in criteria pollutant emissions associated with the production of electricity, electricity production may occur outside of the SJVAB, and is therefore accounted for as part of the CEQA review process at the source of production, rather than at individual consumers; therefore, emissions associated with electricity consumption are not subject to basin-specific thresholds, and are not discussed further in this analysis. (However, emissions of greenhouse gases associated with electricity consumption are accounted for at the consumer level, because impacts associated with greenhouse gas emissions are global, rather than regional. Refer to *Section 3.8 Greenhouse Gas Emissions and Climate Change* for a discussion of potential greenhouse gas emissions impact associated with the Project's consumption of electricity.) The Project would also generate mobile emissions due to occasional maintenance vehicle trips. However, these trips would be infrequent and would not generate substantial mobile emissions due to the Project. Therefore, the Project's operational emissions would result in a less than significant impact to regional air quality.

Significance Determination before Mitigation

Potentially significant.

Mitigation Measures

Although construction BMPs are proposed to be implemented, the Project would exceed SJVAPCD's construction emissions thresholds. The following mitigation measures would reduce the air quality impacts from construction emissions:

Mitigation Measure AIR-1: Dust Control Plan. A Dust Control Plan shall be developed that ensures the following dust control measures are implemented throughout the duration of construction activity:

- The grading plan design shall minimize the area of active grading at any one time to the extent feasible.
- Water trucks or sprinkler systems shall be used in sufficient quantities to prevent airborne dust from leaving the site. Increased watering frequency shall be required whenever wind speeds exceed 15 miles per hour (mph). Reclaimed (non-potable) water shall be used whenever possible.
- In order to avoid long distances and associated travel time between water sources and the work area, onsite temporary pipelines shall be employed to move water to the current work area and thereby reduce fill times for water trucks.
- To best address fugitive dust proximal to workers, clear boundaries shall be established for the assignment of dust control as between the principal contractor and subcontractors. The subcontractors shall be required to maintain dust control in their work area. Maps showing each contractor's area of responsibility for dust control shall be distributed as work areas change. These maps shall be given to each water truck driver in an effort to reduce duplication of efforts while assuring full coverage. Water trucks will be assigned to specific crews or areas. In addition, each water truck driver shall be equipped with a radio to respond to any area that is experiencing dust or equipment operations that require additional dust suppression measures.
- Principal contractor and subcontractors shall maintain a 15 mph speed limit on roads where water application is the sole form of dust control, and shall post signs to remind workers throughout the work

areas. Compliance with the speed limit shall be monitored. As an additional measure, all of the cart operators shall be required to complete a buggy training course prior to operation of any vehicle onsite.

- Water truck operations shall adjust their spraying methods according to daily weather conditions and local site conditions. For example, during windy conditions trucks should point the water spray downward. In silty soils, trucks should use light front spray followed by the heavier back spray. In clay soils, a heavy spray is applied well before traffic is expected in the area. This set of techniques shall be conveyed to new water truck operators when they arrive to the work site.
- Where access by water trucks is limited by structures or other conditions, hand-operated water tanks (i.e. water buffalos) shall be used to provide dust control. Hand-operated water tanks can be used to apply water directly to the work area by crew members.
- Heavy construction equipment traveling on dirt roads on the Project site shall be preceded by a water truck to dampen roadways and reduce dust from transportation along onsite dirt roads.
- All dirt stock pile areas shall be sprayed daily as needed.
- Exposed ground areas that are planned to be reworked at dates greater than one month after initial grading shall be sown with a fast germinating, non-invasive grass seed and watered until vegetation is established.
- All roads shall be stabilized using gravel, chemical soil binders, jute netting, or other methods outlined in the Dust Control Plan. For all structure pads and other areas to be paved, seeding or soil binders shall be used if construction or paving will not occur within 10 days of grading.
- Install track-out control devices where vehicles enter and exit unpaved roads onto streets, or wash off trucks and equipment leaving the site.
- Sweep paved/unpaved roadways boundaries (e.g. project entrance roadways) at the end of each day if visible soil material is carried onto adjacent paved roads. Water sweepers with reclaimed water shall be used where feasible.
- All of the above fugitive dust mitigation measures shall be shown on grading and building plans.
- Principal contractor and subcontractors shall designate up to four persons to monitor the fugitive dust emissions and enhance the implementation of the measures as necessary to minimize dust complaints, reduce visible emissions below 20 percent opacity, and to prevent transport of dust offsite. As necessary, the monitor shall have the authority to require additional dust control measures be implemented. The monitor shall file monthly reports, including a daily log documenting monitoring activities, exceedances, and measures taken to reduce dust emissions. Their duties shall include weekdays, holidays and weekend periods when work may not be in progress. The name and telephone number of such persons shall be provided to the SJVAPCD Compliance Division prior to the start of any grading, earthwork or demolition.

Mitigation Measures AIR-2: Idling Restrictions. The following mitigation measures shall be implemented throughout the duration of construction. Prior to the issuance of any grading permit, construction drawings shall be submitted that include idling restrictions near sensitive receptors for both on and off-road equipment (applicable to the northern part of the Project site only), including:

- Staging and queuing areas shall not be located within 1,000 feet of sensitive receptors.
- Diesel idling within 1,000 feet of sensitive receptors is not permitted.
- Signs that specify the no idling requirements must be posted and enforced at the construction site.

Implementation of **Mitigation Measure AIR-1** would reduce fugitive dust and potential exposure to construction personnel. **Mitigation Measure AIR-2** would reduce exposure of sensitive receptors to NO_X emissions associated with operation of diesel-fueled equipment throughout construction of the Project. However, **Mitigation Measures AIR-1 and AIR-2** would reduce fugitive PM_{10} and emissions from diesel combustion, but would not substantially reduce total emissions below the levels shown in **Table 3.4-5**. Therefore, **Mitigation Measures AIR-1 and AIR-2** would not reduce overall emissions to a less than significant level, and construction emissions would remain significant.

To fully mitigate Project impacts to air quality, the Project would be required to enter into a Voluntary Emission Reduction Agreement (VERA) with the SJVAPCD. Through the VERA, the project proponent provides pound-for-pound mitigation of emissions that exceed applicable SJVAPCD construction thresholds through a process that develops, funds, and implements emission reduction projects, with the SJVAPCD serving as the administrator of the emissions reduction projects and verifier of the successful mitigation effort. Therefore, the following mitigation measure, combined with implementation of Mitigation Measures AIR-1 and AIR-2, would reduce the air quality impact from construction emissions to a less than significant level:

Mitigation Measure AIR-3: Voluntary Emission Reduction Agreement (VERA). Semitropic and the SJVAPCD shall enter into a Voluntary Emission Reduction Agreement in which Semitropic agrees to mitigate project-specific emissions by providing funds for the SJVAPCD's Emission Reduction Incentive Program (ERIP). The funds are disbursed by ERIP in the form of grants for projects that achieve emission reductions. Through the VERA, SJVAPCD verifies the actual emission reductions that have been achieved as a result of completed grant contracts, monitors the emission reduction projects, and ensures the enforceability of achieved reductions. The initial agreement is based on the projected maximum emissions increases as calculated by a SJVAPCD-approved air quality impact assessment, and contains the corresponding maximum fiscal obligation. However, because the goal is to mitigate actual emissions, the SJVAPCD has designed flexibility into the VERA such that the final mitigation is based on actual emissions related to the project as determined by actual equipment used, hours of operation, etc., and as calculated by the SJVAPCD. After the project is mitigated, SJVAPCD certifies to Semitropic that the mitigation is completed, providing Semitropic with an enforceable mitigation measure demonstrating that project-specific emissions have been reduced to a less than significant level through SJVAPCD-approved emission reduction projects. Additional information regarding the VERA process can be obtained by contacting the SJVAPCD CEQA staff at (559) 230-6000.

Significance Determination after Mitigation

Implementation of Mitigation Measures AIR-1, AIR-2, and AIR-3 would reduce Project impacts on air quality from construction to a less than significant level.

Impact AIR-2 Expose Sensitive Receptors to Substantial Pollutant Concentrations

Construction

All Facilities

CARB's *Air Quality and Land Use Handbook: A Community Health Perspective* (CARB, 2005) recommends against siting sensitive receptors within 500 feet of a freeway, urban roads with 100,000 vehicles per day, or rural roads with 50,000 vehicles per day. However, the Project does not involve development of any new sensitive receptors. As discussed in Section 3.4.1, sensitive receptors identified within 1,000 feet of the project site include nine residences located between 200 and 800 feet from Blakeley Canal at the northern end of the project site boundary. These residences would not be near construction activity that would be ongoing for an extended period of time. Construction in the area would last approximately 16 months. However, the construction activity included in Schedule I would occur over 207

acres and would not be concentrated near any of these sensitive receptors for a substantial portion of this period. Although diesel exhaust particulates from construction equipment operation may contribute to toxic air contaminants on or near the Project site during construction, nearby sensitive receptors would not be located close enough to be significantly impacted. Therefore, sensitive receptors would not be exposed to substantial pollutant concentrations.

Operations and Maintenance

All Facilities

As previously noted, the Project would use electricity to pump water and would be connected to the electricity grid, utilizing electricity generated offsite and supplied by PG&E. Although consumption of electricity may indirectly result in criteria pollutant emissions associated with the production of electricity, electricity production would occur at locations remote from the Project and therefore would not expose nearby sensitive receptors to substantial pollutant concentrations. As such, the potential for the Project's operational emissions to expose sensitive receptors to substantial pollutant concentrations is considered to be less than significant impact.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact AIR-3 Create Objectionable Odors Affecting a Substantial Number of People.

Construction

All Facilities

According to the SJVAPCD, facilities that commonly emit odorous compounds include wastewater treatment facilities, sanitary landfills, transfer stations, composting facilities, petroleum refineries, asphalt batch plants, chemical manufacturing, fiberglass manufacturing, painting/coating operations, food processing facilities, feed lots/dairies, and rendering plants (SJVAPCD, 2015). The Project involves operation of new surface water storage and conveyance facilities, which would not result in substantial emissions of odorous compounds. During construction activities, only short-term, temporary odors from vehicle exhaust and construction equipment engines would occur. As discussed in Section 3.3.1, sensitive receptors identified within 1,000 feet of the Project site include nine residences located between 200 and 800 feet from Blakeley Canal at the northern end of the Project site boundary. These residences would not be near construction activity that would be ongoing for an extended period of time. Construction in the vicinity of the Blakeley Canal would last approximately 16 months. However, the construction activity included in Schedule I would occur over 207 acres and would not be concentrated near any of these sensitive receptors for a substantial portion of this period. In addition, construction-related odors disperse and dissipate over relatively short distances. Therefore, sensitive receptors would not be substantially affected by objectionable odors.

Operations and Maintenance

All Facilities

The proposed Project would use electricity to pump and convey water, generated offsite and supplied by PG&E. Project operations would not result in the production of objectionable odors, and therefore potential impacts relating to odors is considered to be less than significant.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact AIR-4 Conflict With or Obstruct Implementation of the Applicable Air Quality Plan

Construction, Operations and Maintenance

All Facilities

A project would be inconsistent with the SJVAPCD's Air Quality Management Plan (AQMP) if it would generate population, housing, or employment growth exceeding the forecasts used in the development of the AQMP. The Project is a water storage and conveyance facility and would not generate population, housing, or employment. Therefore, the proposed Project would be consistent with the AQMP.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Cumulative Impacts

As discussed under *Current Ambient Air Quality*, the Basin is in nonattainment for the State and federal ozone and $PM_{2.5}$ ambient air quality standards, as well as the State PM_{10} ambient air quality standards. Cumulative development in the Basin would contribute to these existing exceedances, exacerbating existing air quality conditions in the region, which is a significant cumulative impact. As shown in **Table 3.4-5**, the Project would result in substantial emissions of the ozone precursor NO_X, as well as PM_{10} and $PM_{2.5}$ during the construction period. Mitigation Measures AIR-1, AIR-2, and AIR-3 would reduce this Project level impact to a less than significant level by reducing and offsetting Project construction emissions, effectively reducing criteria pollutant emissions below applicable SJVAPCD construction thresholds. As discussed in Impact AIR-5, the project would not conflict with the SJVAPCD's AQMP, because the Project would not generate population, housing, or employment, and therefore would be consistent with the growth assumptions in the AQMP. Therefore, the Project would not result in a cumulatively considerable contribution to this significant cumulative impact.

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3.5 Biology

This section addresses biological resources issues related to the proposed Project described in *Chapter 2 Project Description*. Section 3.5.1 presents the environmental setting, and Section 3.5.2 presents the regulatory setting for biological resources at the Tulare Lake Storage and Floodwater Protection Project area. Section 3.5.3 presents the Impact Analysis and identifies avoidance, minimization, and mitigation measures to lessen the impact of the Project on biological resources, where appropriate.

The information presented in this section is derived from documents contained in the following appendices to this EIR:

- Appendix C: *Tulare Lake Storage and Floodwater Protection Project Biological Resources Assessment Report* (Rincon Consultants, Inc. 2017a; herein referred to as the Biological Resources Assessment or BRA);
- Appendix D: *Tulare Lake Storage and Floodwater Protection Project Jurisdictional Waters and Wetlands Delineation* (Rincon Consultants, Inc. 2017b, herein referred to as the Delineation Report);

To support the impact analysis, data on biological resources were also collected and reviewed from numerous published and historical sources, including relevant literature, maps of natural resources, and data on special status species and sensitive habitat information obtained from the California Department of Fish and Wildlife (CDFW), California Natural Diversity Data Base (CNDDB) (2017; queried April 2016 and updated April 3, 2017), the California Native Plant Society Online *Inventory of Rare and Endangered Plants of California* (2017), and the United States Fish and Wildlife Service (USFWS) Information, Planning and Conservation System (USFWS, 2017a). The USFWS Critical Habitat Mapper (2017b) and National Wetlands Inventory (2017c) were also queried. Additionally, the United States Geological Survey (USGS) National Hydrography Dataset (NHD) was also reviewed.

In conjunction with the literature reviews and database queries, Rincon conducted site visits on May 25-27, and December 8, December 15, December 19, and December 20, 2016 to characterize the existing conditions within the Project area.

3.5.1 Environmental Setting

The biological conditions of the proposed Project area, including an additional 500-foot buffer surrounding the Project area, were evaluated for the potential occurrence of sensitive biological resources including, special status plant and animal species, sensitive plant communities, and potentially jurisdictional waters and wetlands (Study Area). Field surveys were conducted to characterize the biological resources present or potentially occurring on-site, including reconnaissance-level surveys and jurisdictional delineation of wetlands and waters (see Appendices C and D for full descriptions of surveys and methodologies).

The Study Area boundaries as presented in appended technical reports differ somewhat from the anticipated development footprint and cover a larger area than would be impacted; all impact areas were covered in the Study Area. An approximate 660-acre area generally located north of Newton Avenue and west of 23rd Avenue and approximately 1,520 acres west of State Highway 41 were added to the Project area after field surveys were conducted. However, during field surveys conducted in 2016, the 660 acres were noted as being under active agricultural operation with field crops and an orchard, and the 1,520 acres were generally planted with field crops. The 1,520 acres west of State Highway 41 were subsequently removed from the Project area as they were not necessary for construction or operation of the Project (although those acres are still shown in various figures). In this section, the Study Area is referenced when providing general information about resources as identified in the technical studies, and the Project area is referenced for discussion of potential impacts. Discrepancy in acreages between the proposed Project impact area and the

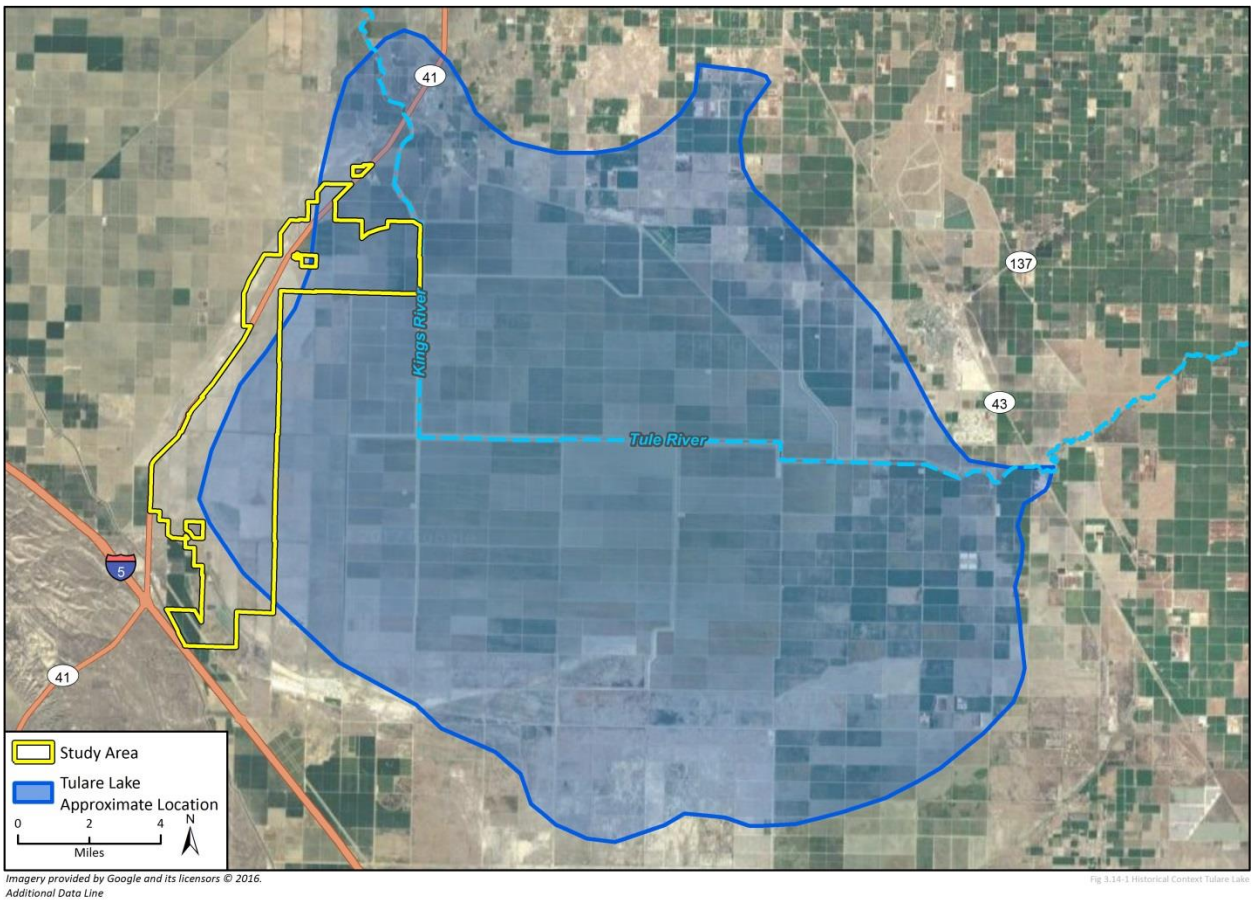
Study Area may be confusing; therefore, references to the Study Area in this section are limited to those discussions of the broad identification and mapping of vegetation communities, aquatic resources, and wildlife activity in the Study Area, and to those cases where an analysis of impacts requires evaluation of biological resources beyond the boundaries of the Project area. This section of the EIR will focus on the development footprint to characterize impacts (Project impact area). Acreages presented in the impact discussions will represent areas within the Project area and will not include the acreages within the 500-foot buffer portion of the Study Area.

Regional Setting

The Project area is located in unincorporated Kings County (County), which occupies approximately 1,391 square miles of both urban and rural land uses. Approximately 90 percent of the County's land area is devoted to agricultural use.

The Project area is located within the lakebed of the historical Tulare Lake (**Figure 3.5-1**), which was once a large freshwater lake within the Tulare Basin. The Tulare Basin is now endorheic (a closed drainage basin), although historically, water was exchanged occasionally with the San Joaquin River Basin in years with high rainfall and larger flood events sufficient to raise surface water elevation more than 207 feet above mean sea level (ECORP, 2007). During the early 1900s the Tulare Lake lakebed was drained to allow for conversion to farmland. Irrigation diversions have since left the lakebed dry during all but the wettest years. The lakebed is one of several low elevation points in the Tulare Basin where historical lakes occurred; other historical lakes within the Tulare Basin were the Kern, Buena Vista, Goose, and Summit Lakes. The historical Tulare Lake was the final termination point for water originating from the Kings, Kaweah, and Tule River watersheds.

Figure 3.5-1: Historical Context – Tulare Lake



The Tulare Basin is located in the southern San Joaquin Valley and retains snowpack runoff and rainfall inflow collected from watershed tributaries located in the Southern Sierra Nevada to the east and Temblor Range to the west. The Basin extends southward to the Tehachapi Mountains. Historically, water from the Tehachapi Mountains to the south also reached the Tulare Lake lakebed during exceptional storms; however, modifications of the land and hydrology in the southern part of the Basin over the last 120 years have largely removed the direct surface connection between waters draining from the Tehachapi Mountains and the former Tulare Lake lakebed. The San Joaquin River marks the northern boundary of the Tulare Basin. During very wet years, water from the northern portion of the Tulare Basin would outflow into the San Joaquin River.

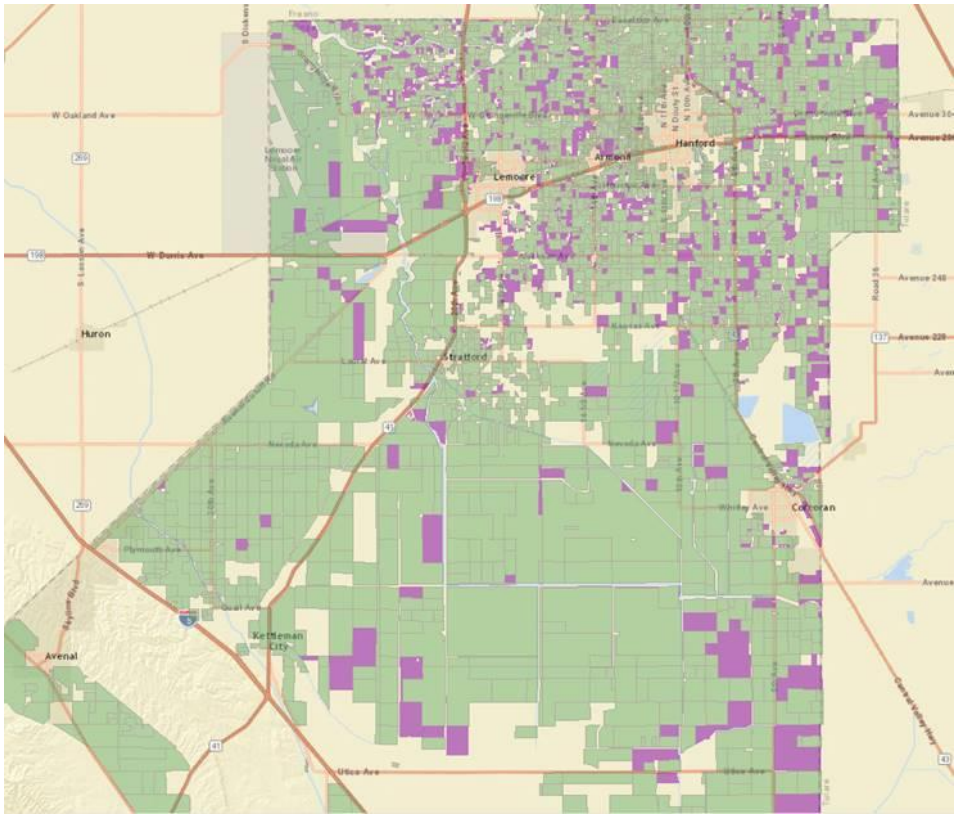
Vegetation within the San Joaquin Valley has been significantly modified and disturbed by human activity. The region once consisted of a diverse assemblage of habitats forming a mosaic of perennial bunchgrass ecosystems, oak savannas with grassland understory, desert grasslands in drier areas, riparian woodlands, freshwater marshes, alkali sink, and vernal pool habitats. Extensive agricultural conversion and subsequent urban/suburban development that includes energy and military related development during the 19th and 20th centuries resulted in substantial modification to virtually all habitats within the San Joaquin Valley. Grasslands in the region are now dominated by introduced non-native grasses. In addition, many of the wetlands and aquatic habitats that once occurred have since been drained or significantly altered to support the extensive irrigation infrastructure of the San Joaquin Valley. In general, agriculture, urban expansion, energy exploration, military development, and the resultant changes to hydrologic regimes have resulted in considerable loss of habitat, loss of native vegetation communities and a decline in species diversity.

Project Area Setting

The Project area is situated on a combination of recently fallowed (grazing) and active farmland within the western perimeter of the historical Tulare Lake lakebed, just east of the eastern slopes of the Kettleman Hills. The Project area is located on relatively flat to slightly concave farmland in the *Westhaven, Stratford, Kettleman City, Stratford SE,* and *Los Viejos, California* USGS7.5-minute topographic quadrangles at elevations ranging between 175 to 384 feet above mean sea level (USGS 1929; 1930; 1933b; 1934; 1943a; 1954a; 1954b; 1954c; 1956; 1963; 2012a; 2012b; 2015a; 2015b; 2015c).

The Study Area is a highly-managed landscape with limited natural vegetation. The majority of the site is a mosaic of active cropland and fallow fields currently used as pasture. The 1991 DWR crop survey data show the fallow fields were in active agricultural production at that time, as shown below in **Figure 3.5-2**. Many of those active agricultural lands have since been converted to the current grazing activity. Where active crop production was observed in the Study Area, crops include cotton as well as orchards. Annual crops such as cotton appear to be irrigated primarily using surface irrigation methods such as furrow and flood irrigation, while the majority of orchards appear to be drip irrigated.

Figure 3.5-2: Historical Agricultural Production in Project Area



Fallow fields are currently used for pasture with cattle actively grazing some areas. These fallow fields have consistent short berms crossing the fields at regular intervals, and swales and conveyance ditches around the margins, consistent with land management practices used to support irrigation.

A system of relatively permanent irrigation ditches, drainage ditches, and canals is present throughout the Study Area. As previously noted, this system is heavily managed, and while hydrophytic vegetation is present in many of these ditches, regular maintenance limits its extent. Where irrigation was not currently

underway, many of these ditch features were dry or had limited surface water at low points where rainwater had collected.

Climate

The San Joaquin Valley has a Mediterranean climate characterized by hot, dry summers and short foggy winters. The Kettleman City weather station, located approximately 0.4 mile west of the Study Area, has recorded weather conditions since 1955. Average high temperatures range from 100.1 degrees Fahrenheit (°F) in July to 55.2°F in January, and average low temperatures range from 35.2°F in January to 68°F in July (Western Regional Climate Center, 2016). The average total annual precipitation is 6.64 inches. The majority of rainfall occurs during the winter months (Western Regional Climate Center, 2016). A dense fog unique to the San Joaquin Valley known as Tule fog frequently occurs during the winter months when relative humidity is high (typically after rain events), calm winds prevail, and rapid cooling occurs during the night. Tule fog is typically heaviest in the lowest elevations of the Valley. Tule fog generally dissipates before noon and rarely occurs along the foothills.

Vegetation Community and Land Cover Types

Vegetation communities and other land cover types can be grouped into three general classes in the Study Area: agricultural lands, aquatic resources, and other vegetation types. Vegetation classifications are based on the classification systems provided in *A Manual of California Vegetation, Second Edition* (Sawyer et al., 2009) and *Preliminary Descriptions of the Terrestrial Communities of California* (Holland, 1986) where natural vegetation persists, but have been modified to reflect the existing site conditions. The vegetation types present in the Study Area consist primarily of active cropland, fallow agricultural land and grazing land. Upland portions of the Study Area that are not located on cropland, fallow agricultural land or grazing land consist of non-native grasslands, with some areas that support seasonal wetlands, ruderal and disturbed areas, and disturbed valley saltbush scrub habitat. Additionally, managed aquatic resources are present in the Study Area, including aqueducts and canals, irrigation and drainage ditches, ephemeral streams at the western edge of the site, and constructed seasonally flooded basins. These vegetation communities and land cover types were mapped within the Study Area during the field surveys as follows (**Figures 3.5-3** and **3.5-4**; see also **Table 3.5-1** at the end of this section):

- Agricultural Lands
  - Cultivated annual crops (active farmland)
  - Orchards (active farmland)
  - Managed pasture
  - Fallow fields/pasture (fallow farmland currently managed as pasture)
- Aquatic Resources
  - Aqueduct
  - Canals Irrigation and drainage ditches
  - Ephemeral streams
  - Constructed basins and seasonal wetlands
- Other Vegetation Communities:
  - Disturbed valley saltbush scrub

- Annual grassland
- Ruderal and disturbed areas

Figure 3.5-3: Vegetation Communities of the Kettleman Reservoir

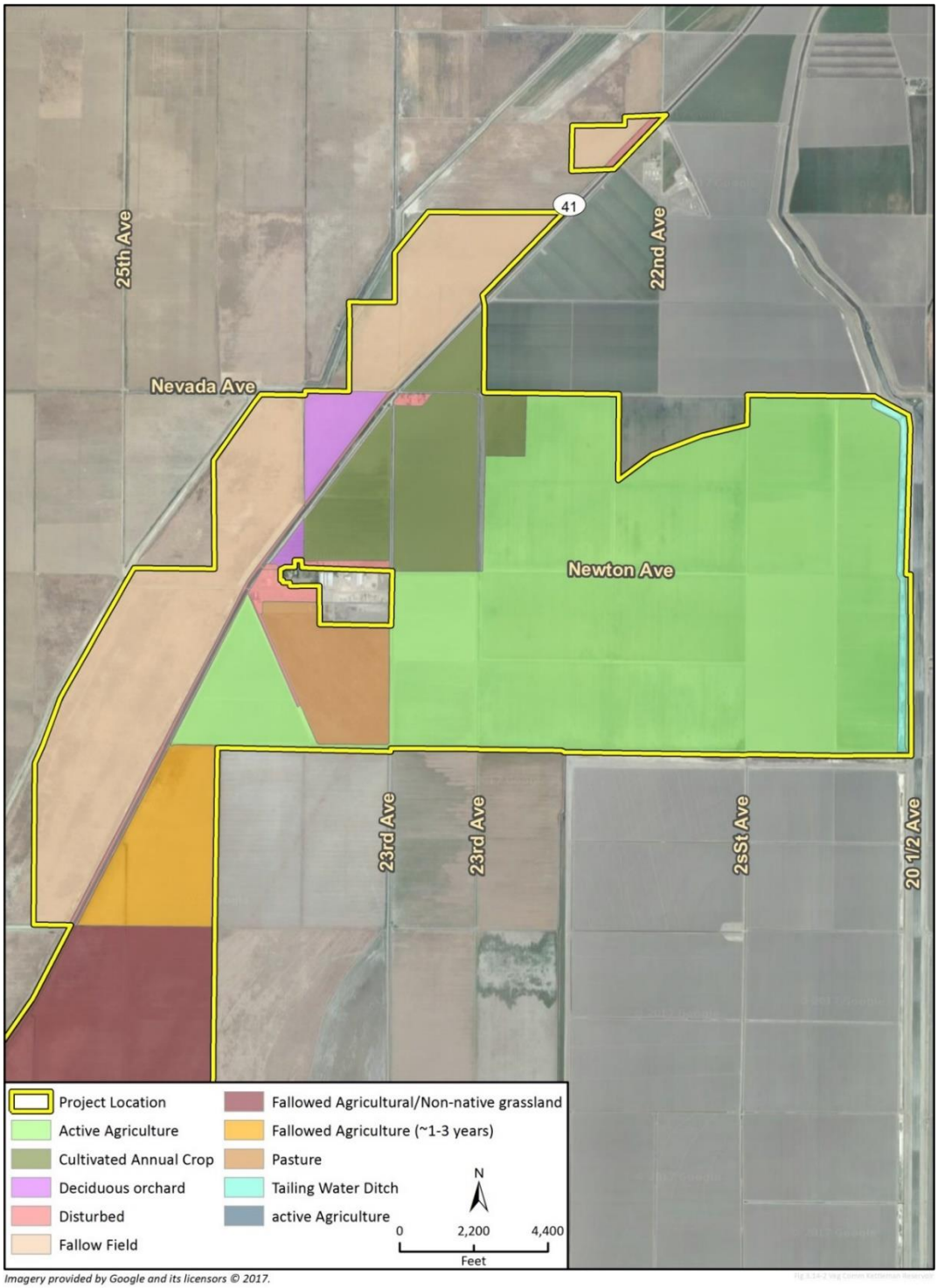
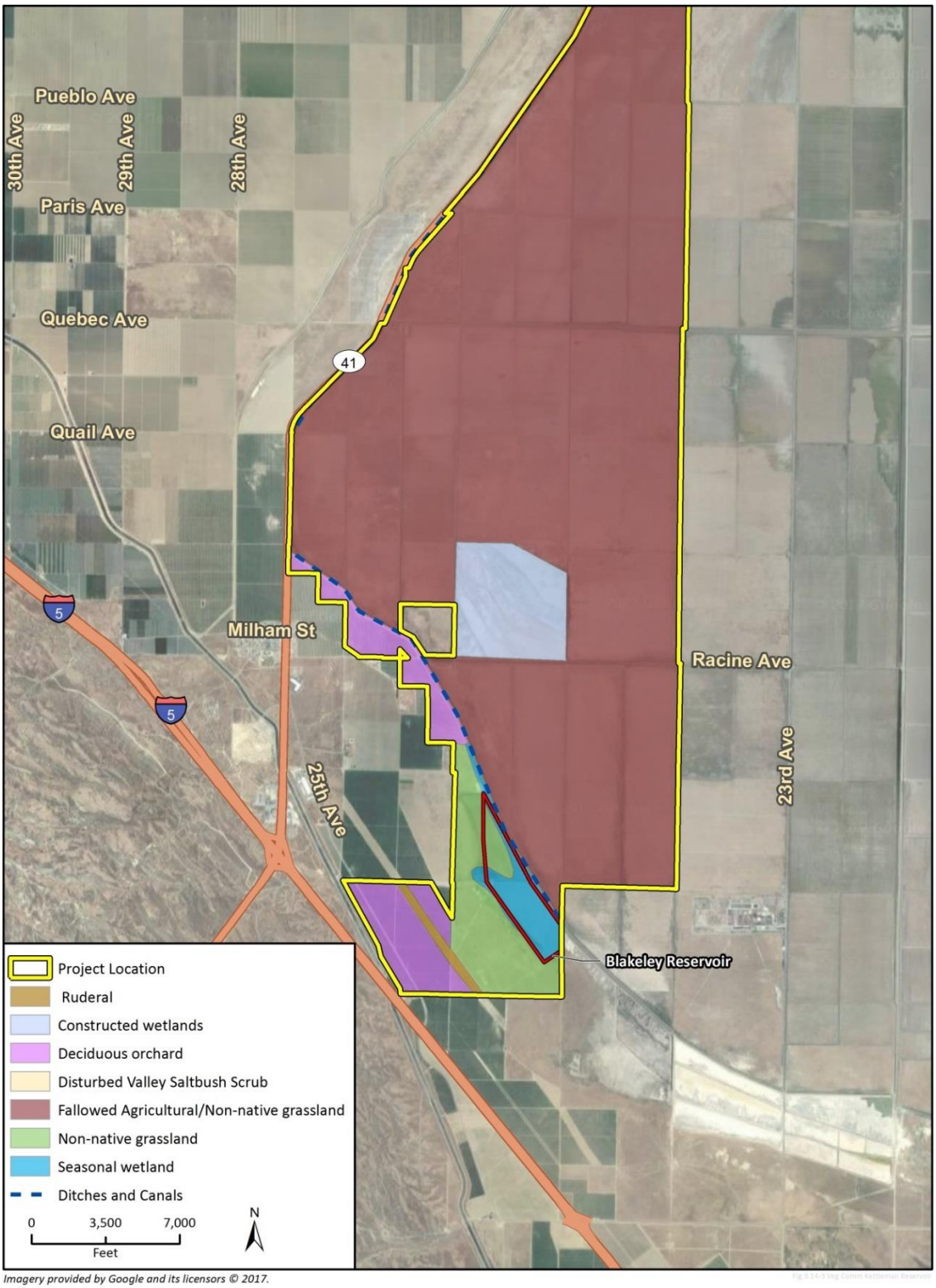


Figure 3.5-4: Vegetation Communities of the Kettleman Reservoir



Agricultural Lands

More than 80% of the Study Area consists of agricultural land cover types. Agricultural activities have largely removed native vegetation from the Study Area in most locations, and the majority of plant communities are dominated by non-native species. Land cover descriptions are provided in the following sections. For mapping purposes, existing access routes and farm roads used to support agricultural uses are mapped with the agricultural land use they support.

Cultivated Cropland (annual crops)

The northern portion of the Study Area is primarily active farmland currently used for cultivated annual crops, such as cotton. Fields are plowed annually and irrigated. Weeds are managed and very little non-crop vegetation persists.

Managed Pasture

A pasture with permanent and electric fencing and facilities to periodically irrigate is present near the north end of the Study Area east of Blakeley Canal. This field has Bermuda grass (*Cynodon dactylon*) and a variety of non-native annual grasses and forbs, including bristly ox tongue (*Helminthotheca echioides*).

Orchards

Orchards in the Study Area and its vicinity are predominately planted with pistachio (*Pistacia vera*) and almond (*Prunus dulcis*) trees. These areas are highly maintained and likely receive regular rodenticide, herbicide, insecticide, and/or fertilizer treatments. Understory vegetation is limited. Some weedy plant species including tumble weed (*Amaranthus albus*) and cudweed (*Pseudognaphalium luteoalbum*), and natives tolerant of high levels of disturbance, including rayless pineapple weed (*Matricaria discoidea*) persist along the access roads.

Fallowed Agriculture

Fallowed agricultural land in the Study Area has been significantly altered by agriculture, grazing, and other land-clearing activities. In the past, this area was dominated by dry-land farming operations but has since been converted to grazed rangelands which are irregularly disced. The vegetation types identified in this area consist of non-native annual grasses, including red brome (*Bromus rubens*), ripgut brome (*B. diandrus*), foxtail barley (*Hordeum jubatum*), wild oat (*Avena fatua*), and Italian rye grass (*Festuca perennis*), and herbs including mustards (*Brassica rapa*; *Descurainia sophia*) and Russian thistle (*Salsola tragus*). In a few areas, dead trees from an orchard that has not survived the drought are present on fallowed agricultural land.

Other Upland Land Cover Types

Non-Native Annual Grassland

A small portion of the Study Area in the southwest corner, adjacent to a constructed basin locally known as Sandridge Reservoir or Blakeley Reservoir (Blakeley), is comprised of non-native annual grassland vegetation. This area consists predominately of non-native annual grasses including red brome, ripgut brome, foxtail barley, and Italian rye grass. Herbaceous species, including filaree (*Erodium cicutarium*), as well as lamb's quarters (*Chenopodium album*) and Russian thistle are also present in this vegetation type.

Ruderal and Disturbed Areas

A small area within the Study Area adjacent to the orchards in the southern portion of the Kettleman Reservoir, north of Blakeley Canal and near the high voltage lines, consists of disturbed ruderal vegetation that is disced regularly. This area consists predominately of non-native annual species including perennial broadleaf species, and non-native grasses. Species identified in this location include sunflower (*Helianthus*

annuus), mustards, Russian thistle, red brome, ripgut brome, foxtail barley, wild oat, and Italian rye grass. Heavily disturbed areas associated with existing farm buildings and roads typically have limited vegetation. Some non-native trees are present in these areas.

Disturbed Valley Saltbush Scrub

Disturbed valley saltbush scrub is typically associated with areas that have been degraded by disturbances. An isolated area of marginal saltbush scrub habitat occurs along the western portion of the Kettleman Reservoir next to the California Aqueduct. Plant species observed in this area include saltbush (*Atriplex polycarpa*). Disturbed saltbush scrub is present in degraded and considerably disturbed areas.

Aquatic Resources

Based on previous U.S. Army Corps of Engineers (USACE) determinations that Tulare Lake is a Traditional Navigable Water (TNW), and recent determinations of seasonal ditches flowing into the Tulare Lake bed as jurisdictional tributaries to TNWs, USACE may potentially assert jurisdiction over aquatic resources in the Study Area with traceable connections to the Tulare Lake bed. Further, since the Project area is within the historic Tulare Lake bed, and would restore the waterbody during an anticipated three out of ten years, USACE may potentially claim jurisdiction over the entire Project area.

Aquatic resources in the Study Area include large, perennially wet features such as canals and aqueducts, as well as smaller features such as irrigation and drainage ditches in which hydrologic regime is controlled by whether water is allowed to flow into these features in a particular season. These features are recognized as part of the existing agricultural operations surrounding these features, but are mapped separately as they differ in terms of vegetation, management strategy, and potential to support wildlife. These features are generally mapped to top of bank, levee or berm as part of habitat/land cover mapping shown in (**Figures 3.5-2** and **3.5-3**). Delineation of potentially jurisdictional features to ordinary high water mark is described in the next section.

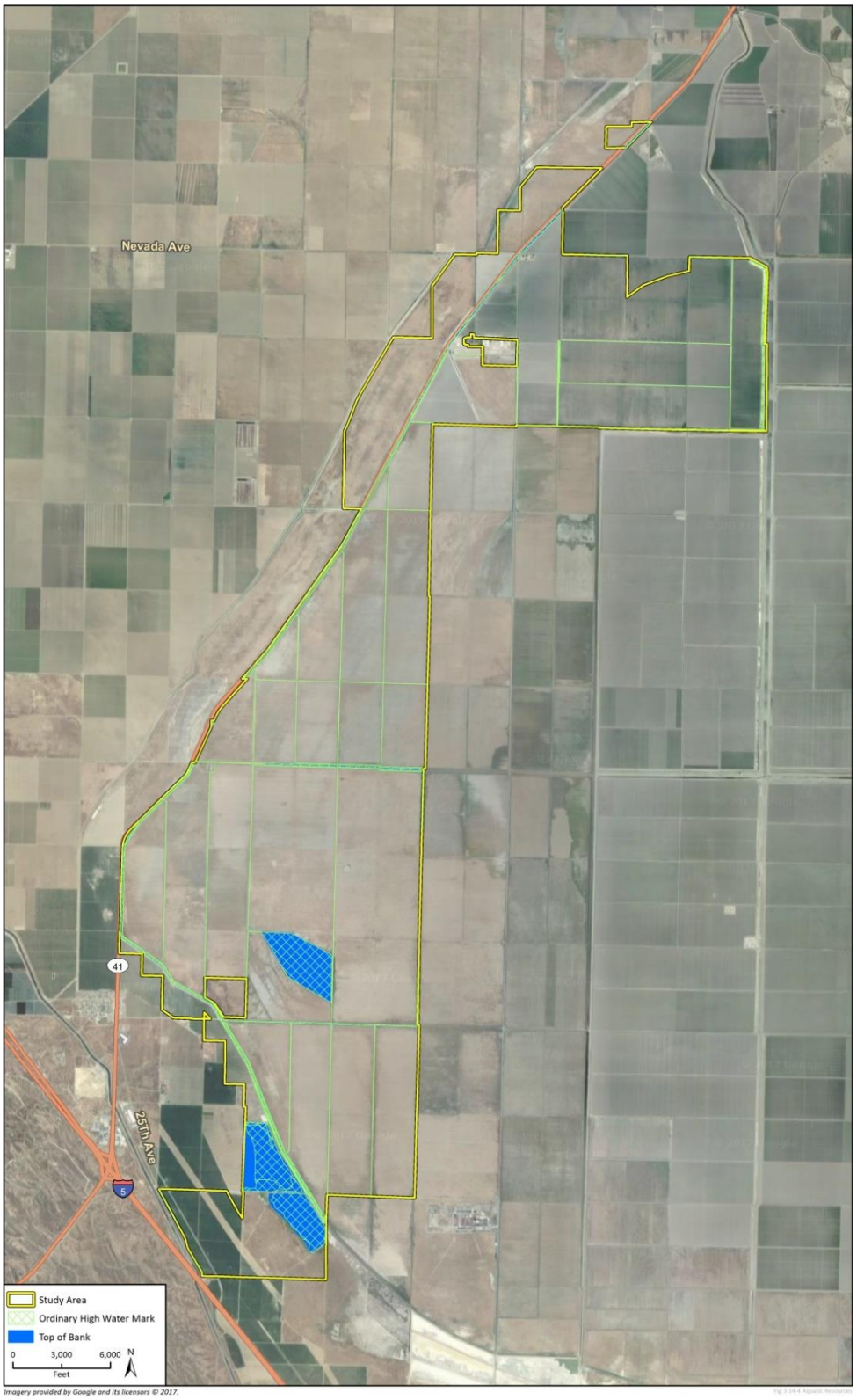
Irrigation and drainage water systems and basins on active agricultural lands in the Study Area are heavily managed, and hydrophytic vegetation may be present only ephemerally depending upon how recently management activities have been conducted and whether the feature is currently in use. In some features, vegetation management was actively occurring during field work, and in others, signs of recent management activities were noted in the form of piled trimmed vegetation and spoils.

Canals

The Study Area contains two major named canals, including the Blakeley Canal and a channelized portion of the Kings River contained within the South Fork Canal; water is diverted into both canals at Empire Weir No. 2 near the north end of the Project area. A third large, unnamed canal running approximately east-west, at Quebec Avenue near the midpoint of the Study Area, connects to the Blakeley Canal through a pump system. East of the Study Area, this canal connects to the intersection point of the Kings River – South Fork Canal, and the channelized Tule River (**Figure 3.5-4**). Infrastructure for water management, including gates, weirs, and pump systems, are present in these features, and allow for movement of water in different directions and between different systems, when conditions are appropriate.

Vegetation along the Blakeley and South Fork Canals shows signs of frequent management activities. At Empire Weir No. 2, some riparian trees are present, including willow (*Salix gooddingii*) and cottonwood (*Populus fremontii*); however, most herbaceous vegetation was absent. Irregular patches of hydrophytic vegetation were noted in portions of the canals that had not been recently maintained; other areas were nearly devoid of plants. Water was present in all these canals during field surveys.

Figure 3.5-5: Aquatic Resources



Irrigation and Drainage Ditches

Other aquatic features identified in the Study Area include numerous agricultural conveyance ditches that traverse field margins at regular intervals. These features vary in size, and are connected to one or more of the canals or other conveyance ditches through structures such as gates or through pump facilities. Some ditch features have hydrophytic vegetation in at least some portion of the ditch, ranging from tules (*Schoenoplectus* spp.*)* and cattails (*Typha domingensis*) to facultative herbaceous species including alkali weed (*Cressa truxillensis*), salt heliotrope (*Heliotropium curassavicum*), and western sea purslane (*Sesuvium verrucosum*). Tamarisk (*Tamarix ramosissima*) is also present in some of the features, particularly near Blakeley Canal in the southern portion of the Study Area.

In the absence of vegetation management activities and with presence of water, all these ditches would be expected to recruit a fringe of hydrophytic vegetation along the water's edge, and in the absence of water, the vegetation would die, indicating vegetation is management-dependent. Many of the irrigation and drainage ditch features are regularly maintained in an unvegetated state, particularly in the northern part of the Study Area.

Streams

Two ephemeral stream systems were identified near the southwestern edge of the Study Area. Both streams originate in the hills west of the Study Area, and terminate west of 25th Avenue. Both appear to be conveyed beneath Interstate 5 (I-5) and the California Aqueduct in culverts, and have small ephemeral channels that terminate near 25th Avenue. Neither feature has riparian or wetland vegetation, and both are in the bottom of incised gully systems.

Aqueduct

The Study Area includes a short segment of the California Aqueduct (also known as the Edmund G. Brown Aqueduct) that carries flows associated with the State Water Project from the Sacramento-San Joaquin Delta south. The California Aqueduct is a concrete-lined channel, bermed above local grade at this location, and lacks vegetation.

Constructed Basins and Seasonal Wetland Habitat

Constructed basins were noted near the south-central portion and southwestern edges of the Study Area. Near the south-central area, berms surround almost one square mile of land; however, the southwestern portions of this feature have no indication of recent surface water. These southern portions are vegetated with non-native annual grasses and salt cedar/tamarisk. The northeastern two segments had facultative vegetation, including swamp pricklegrass (*Crypsis schoenoides*), alkali weed (salt heliotrope and western sea purslane, as well as occasional willow (*Salix lasiolepis; S. gooddingii*) and scattered tamarisk, and showed signs of recent inundation. Hydrology is artificially controlled, and the basin appears to fill from overflow from irrigation ditches.

Constructed basins are also present near the southwestern edge of the Study Area near Blakeley Canal. This area is known locally at least informally as the Blakeley Reservoir and is where waters from Blakeley Canal can be stored as shallow surface water in two basins on a seasonal basis. The Blakeley Reservoir is flooded seasonally and retains water for agricultural irrigation use. During the 2016 site visit, this area was dominated by hydrophytic vegetation; under flooded conditions in higher rainfall years, it is expected that hydrophytes in this reservoir may be drowned in the reservoir bottom but would persist at the shorelines and margins. The southernmost of these two basins is bermed on three sides and open on the western edge. A band of cattails (*Typha* spp.) near the shoreline of the most recent inundation event is visible, though the majority of these cattails have since died. The northern basin is bermed on all four sides, and contains

complexes of live wetland vegetation including cattail and common three square (*Schoenoplectus pungens*) in some areas.

Additionally, a disturbed seasonal wetland was mapped along a drain channel on the eastern edge of the northern Study Area in a low area near a drain. Alkali weed is the predominant plant observed in this area, typically at low cover. Salt crusts are common.

Table 3.5-1: Summary of Vegetation Communities Present Within the Study Area

Vegetation Community	Acreage	Percent of Study Area
Agricultural Lands		
Cultivated annual crops (active farmland)	3961.30	20.06
Orchards (active farmland)	813.93	4.12
Managed pasture	261.80	1.33
Fallowed Fields/Non-native grassland	13,129.35	66.49
Other Vegetation Communities:		
Disturbed & Ruderal	186.43	0.94
Disturbed Valley Saltbush Scrub	0.97	0.00
Aquatic Resources		
Canals	200.69	1.02
Irrigation Drainage Ditches	165.55	0.84
Aqueduct	0.03	0.00
Ephemeral Streams	0.01	0.00
Constructed Basins and Seasonal/Constructed Wetlands	1,025.67	5.19
Total	19,745.73	100.00

Aquatic Resources/Potentially Jurisdictional Resources

Previous permitting possessed by USACE suggest the entire historic Tulare Lake bed may potentially be considered a jurisdictional water subject to Sections 404 and 401 of the Clean Water Act. Irrespective, the Delineation Report identified 931.21 acres of potentially jurisdictional waters potentially subject to Sections 404 and 401 of the Clean Water Act, in an approximately 16,700 gross acre Study Area, as summarized in Table 3.5-2. The jurisdictional delineation identified areas are also potentially subject to Section 1600 *et seq*. of the California Fish and Game Code between tops of banks, or to edge of riparian canopy along the Kings River near Empire Weir No. 2. Potential CDFW jurisdiction totals 1,239.7 acres as summarized in Table 3.5-2. Note the final jurisdictional determinations of the boundaries of wetlands, waters, and riparian habitat are made by each agency, typically at the time that authorizations to impact such features are requested. This section provides a discussion with additional detail regarding aquatic resources beyond information already described above, and identifies uses, functions and values of the identified features.

Table 3.5-2: Summary of Aquatic Resources

Type	Potentially Jurisdictional Area
Clean Water Act Section 404/401 Potential Jurisdiction	
Canals	225.94 acres 12,6322 linear feet
Aqueduct	1.09 acres 468 linear feet
Irrigation and Drainage Ditches	129.93 acres 358,392 linear feet
Ephemeral Streams	0.06 acres 461 linear feet
Seasonal Wetlands	65.63 acres
Constructed Basins	508.56 acres
Total	931.21 acres 485,464 linear feet (for linear features)
Potential CDFW 1600 Jurisdiction	
Canals	370.67 acres 126,322 linear feet
Aqueducts	1.38 acres 468 linear feet
Irrigation and Drainage Ditches	233.04 acres 358,392 linear feet
Ephemeral Streams	0.42 acres 461 linear feet
Constructed Basins	634.16 acres
Total	1,239.67 acres 485,643 linear feet

Acreages presented in this section represent extent of potentially jurisdictional areas to top of bank or edge of ordinary high water mark or wetland based on delineation methodology presented in the Delineation Report. Thus, some minor differences may exist between acreages presented here and estimated extent of land cover presented in the previous section.

Canals

Three canals (the Blakeley and South Fork Canals and an unnamed canal adjacent to Quebec Avenue) were mapped, as previously noted. Extent of ordinary high water mark was determined based on field indicators, and top of bank was established based on topography. As previously described, some emergent vegetation is present along canals in some locations and occasional riparian trees are present along Blakeley Canal and the Kings River at Empire Weir No. 2/South Fork Canal. No continuous bands of riparian canopy were documented in the Study Area. Water in the canals is primarily used to support irrigated agriculture. In some locations, the recruitment of emergent vegetation and persistence of occasional riparian shrubs and trees provide some habitat for wildlife at some points during the management cycle when vegetation is

present. Because these features are typically inundated year-round, these canals are also a potential water source for wildlife.

Seasonal Wetlands and Constructed Basin

The seasonal wetlands mapped in low areas near a drain on the east edge of the northern portion of the Study Area, just west of the South Fork Canal, were mapped on the basis of meeting all three wetland parameters: hydric soils, hydrophytic vegetation, and wetland hydrology. The Delineation Report indicated that despite evidence of recent disturbance, this area has a dominance of facultative to hydrophytic vegetation and at least 5% vegetative cover on average, as well as evidence of wetland hydrology and hydric soils. Wetland determination data points and periodic test pits were evaluated to confirm consistency of features and aide in mapping. These wetlands are heavily disturbed, and have limited functionality for sediment trapping and wildlife habitat.

Areas of hydrophytic vegetation were investigated for potential wetlands within the Blakeley Reservoir, which serves primarily to hold excess water in wet years for subsequent use to support irrigated agriculture. In the southern basin, despite presence of hydrophytes, hydric soil indicators were not present. Small redox concentrations were noted but were neither abundant nor prominent enough to indicate hydric soil conditions. Although alkali soil conditions and salts can interfere with hydric soil indicator formation, this possibility was dismissed as the cause of lack of hydric soils due to the abundance and prominence of hydric indicators in other parts of the Study Area with similar presence of alkali soils with salt buildup. In the northern basin of the Blakeley Reservoir, hydric soil indicators were easily verified and where hydrophytic vegetation and hydrology indicators were also met, seasonal wetlands were mapped. When tall emergent vegetation is present, it can provide nesting habitat. Ordinary high water mark and top of berms for these basins were also documented.

Finally, the constructed basin area near Racine Avenue was investigated for potential wetland conditions. The southwestern basins are not in use and show no sign of recent inundation, wetland hydrology, or hydric soils. The northeastern two basins were partially flooded around the margins in 2016, though not fully inundated, and evidence of recent full inundation was visible as water marks and stains. This feature was vegetated with a mixture of facultative grasses and herbs in low areas not currently saturated, including western sea purslane and swamp pricklegrass, with shrubs and small trees such as tamarisk and willows, particularly along channel edges and near the berms. However, hydric soils were not present, and thus, the area was mapped as a basin. Hydrology is artificially controlled, and the basin appears to fill from overflow from irrigation ditches. A review of aerial photos indicates this basin is not frequently inundated, and in many years is dry in the summer months. Tamarisk and willow trees along the berms provide potential nesting habitat.

Irrigation and Drainage Ditches

Irrigation and drainage ditches are present throughout the Study Area, associated with agricultural lands. Their primary use is to support irrigated agriculture, and as noted above, the hydrologic regime and vegetation conditions are highly managed. The presence or absence of both water and vegetation depend on the status of the management cycle in each a given drainage feature. Irrigation ditches that have not been recently maintained may recruit some emergent vegetation that provides potential cover for wildlife, though these vegetated bands are narrow and isolated by surrounding farmlands. Most of the ditches in the northern part of the Study Area have been maintained recently and have little or no vegetation. Many of the ditches in the southern part of the Study Area are not currently in use, have not been recently maintained, and have herbaceous vegetation and occasional tamarisk patches.

Streams

Both ephemeral stream systems dissipate near the southwestern edge of the Study Area near 25th Avenue. The reaches in the study area are short segments at the outfall of culverts under I-5 and the California Aqueduct, and the surrounding areas are largely converted to agriculture.

Aqueduct

The California Aqueduct carries flows associated with the State Water Project from the Sacramento-San Joaquin Delta south. Its primary function is to convey water that supports irrigated agriculture and municipal uses.

Soils

The soils in the San Joaquin Valley formed predominantly on alluvial fans and terraces, with parent material derived from granitic and sedimentary rock from the Coast Ranges to the west, and the Sierra Nevada Mountains to the east (USDA-NRCS, 1984). Based on the *Soil Survey of Kings County, California* (USDA-NRCS, 1984), SSURGO and *Web Soil Survey* (USDA-NRCS, 2016a), the Study Area contains seventeen soil map units: Boggs sandy loam, partially drained; Cantua coarse sandy loam, 5 to 15 percent slopes; Excelsior sandy loam; Grangeville sandy loam, saline-alkali; Homeland fine sandy loam, partially drained; Houser clay, partially drained; Kettleman loam, 5 to 15 percent slopes; Kettleman loam, 15 to 30 percent slopes; Kimberlina fine sandy loam, sandy substratum; Rambla loamy sand, drained; Tulare clay, partially drained; Urban Land; Wasco sandy loam, 0 to 5 percent slopes; Westcamp loam, partially drained; Westhaven loam, 0 to 2 percent slopes; Westhaven loam, 2 to 5 percent slopes; and Water (USDA-NRCS, 2016a). These soil map units are described in detail in Table 3.5-3 below and depicted on **Figure 3.5-5**.

Of the seventeen soil map units identified by the USDA NRCS *Web Soil Survey*, one is mapped as areas of ponded or flowing water, and 11 additional map units have one or more components identified on the *National Hydric Soils List* (USDA-NRCS, 2015). Given the history of the Study Area and its location in a historical lakebed, it is unsurprising that many of these soils have characteristics identified as hydric. Site-specific soil investigations were also conducted at locations where wetland hydrology and hydrophytic vegetation indicated the possibility of a wetland.

Table 3.5-3: Soil Map Units

Soil Map Unit	Characteristics	Hydric Components?
Boggs sandy loam, partially drained	Very deep, somewhat poorly drained, saline-alkali soils on alluvial plains. Formed in alluvium derived dominantly from igneous and sedimentary rock. On slopes ranging from 0-1 percent. Strongly saline. Primarily massive, soft, and friable, non-sticky and non-plastic with few fine roots. Occasional striations of strong, hard, firm, sticky and plastic clay loam around a depth of 40 inches.	Multiple components listed as hydric on the on alluvial flats, alluvial fans, and basin floors.
Cantua coarse sandy loam, 5 to 15 percent slopes	Deep and somewhat excessively drained soils on moderately sloping to rolling hills. Formed in residuum derived dominantly from sandstone with slopes ranging from 5-15. Profile varies between nonsaline to very slightly saline.	No hydric components listed.
Excelsior sandy loam	Well drained, saline-alkali soils on alluvial fans with slopes of 0 to 1 percent. Originate from alluvium derived from igneous and sedimentary rock and vary between very slightly saline to a strongly saline. Saline-alkali characteristics in some areas. Calcareous below depths of 8 inches.	Named component listed as hydric, in sloughs.
Grangeville sandy loam, saline-alkali	Very deep, somewhat poorly drained sandy loam soils derived from alluvial fans and flood plains. Formed in alluvium derived from igneous rock with slopes ranging from 0-1 percent and vary between a slightly saline to a strongly saline. Coarse and loamy.	Multiple components listed as hydric, on alluvial flats, alluvial fans, basin floors, and floodplains.
Homeland fine sandy loam, partially drained	Very deep, partially drained saline-alkali soil on basin rims. Formed in alluvium derived predominantly from igneous and sedimentary rock and has a slope between 0-1 percent. Varies between a slightly saline to a strongly saline. Saline-alkali throughout.	Multiple components listed as hydric, on basin floors.
Houser clay, partially drained	Very deep, saline-alkali soils on basin rims with slopes between 0-1. Derived from alluvium dominantly from igneous and sedimentary rock and vary between a moderately saline to a strongly saline. Calcareous throughout. Mottled and saline-alkali at depths greater than 4 inches.	Multiple components listed as hydric, on basin floors and alluvial flats.
Kettleman loam, 5 to 15 percent slopes	Moderately deep, well-drained soil on hills. Formed in residuum derived dominantly from sandstone or shale and varies between a nonsaline to a very slightly saline. Calcareous below a depth on one inch and has areas where the soil is clay loam throughout.	No hydric components listed.
Kettleman loam, 15 to 30 percent slopes	Exhibits same soil characteristics as Kettleman loam described above, except occurs on upland hills with steeper slopes ranging between 15-30 percent.	No hydric components listed.
Kimberlina fine sandy loam, sandy substratum	Very deep, well-drained soil on alluvial fans. Formed in alluvium derived from igneous and sedimentary rock and varies between nonsaline to slightly saline with slopes ranging from 0-2 percent. Calcareous between 8-28 inches and non-calcareous below 28 inches.	Small areas of unnamed components, in sloughs.
Rambla loamy sand, drained	Very deep, saline-alkali soil on basin rims. Formed in alluvium derived dominantly from igneous and sedimentary rock and varies between moderately saline to a strongly saline. Slope ranges from 0-2 percent. Some areas of surface layer are sand. Soil saline-alkali in some parts.	Multiple components, approximately 10 percent of the unit, on rims and sloughs.
Tulare clay, partially drained	Very deep, somewhat poorly drained, saline-alkali soil in basins with a slope on 0 to 1 percent. Formed in alluvium derived dominantly from igneous and sedimentary rock and varies between slightly saline to moderately saline. Saline-alkali in some areas and calcareous throughout. Mottles are in most layers below the depth of 1 inch	Multiple components, forming the majority of the unit, on basin floors.

Urban Land	Consists of land covered by streets, parking lots, buildings, and other structures that obscure or alter the soils so that identification is not feasible.	Some components, forming up to 6 percent of the unit, on alluvial fans, basin floors, and in sloughs.
Wasco sandy loam, 0 to 5 percent slopes	Deep, well-drained soil on alluvial fans with slopes of 0 to 5 percent. Formed in alluvium derived dominantly from sandstone and varies between nonsaline to slightly saline. Calcareous below depths of 20 inches.	No hydric components listed.
Westcamp loam, partially drained	Very deep, somewhat poorly drained, saline-alkali soil on basin rims and flood plains with slopes of 0- 2 percent. Formed in alluvium derived dominantly from sedimentary and igneous rock and varies between slightly saline to strongly saline. Some areas of surface layer are sandy loam. Mottles are present in most layers below 10 inches in depth.	Multiple components listed as hydric on the on alluvial flats, alluvial fans, and basin floors.
Westhaven loam, 0 to 2 percent slopes	Very deep, moderately well drained soil on alluvial fans with slopes between 0-2 percent. Formed in alluvium derived dominantly from igneous and sedimentary rock and varies between nonsaline to slightly saline. Calcareous to a depth of 72 inches. Mottles in some layers below 24 inches. Some areas of surface layer sandy loam.	No hydric components listed.
Westhaven loam, 2 to 5 percent slopes	Exhibits same soil characteristics as Westhaven loam described above, except occurs on slightly steeper slopes, ranging between 2-5 percent.	A small component, covering up to 2 percent, in depressions.
Water	Consists of areas that are covered in standing or flowing water, making the soil types below unidentifiable. Water levels can fluctuate over the course of a season and from year to year.	Hydric status is implied in areas inundated frequently enough to be mapped as water.

Figure 3.5-6: USDA Soil Map Units

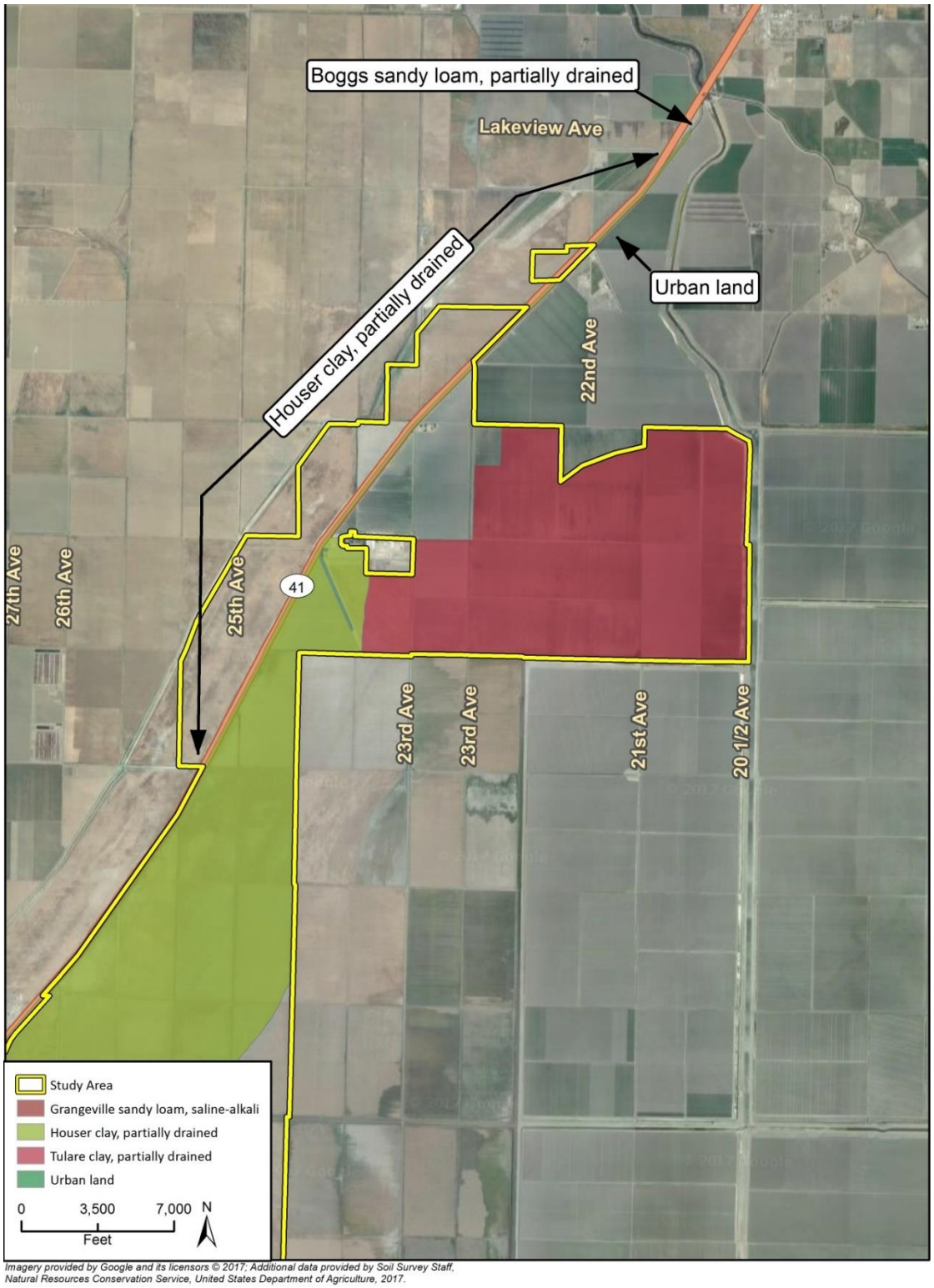
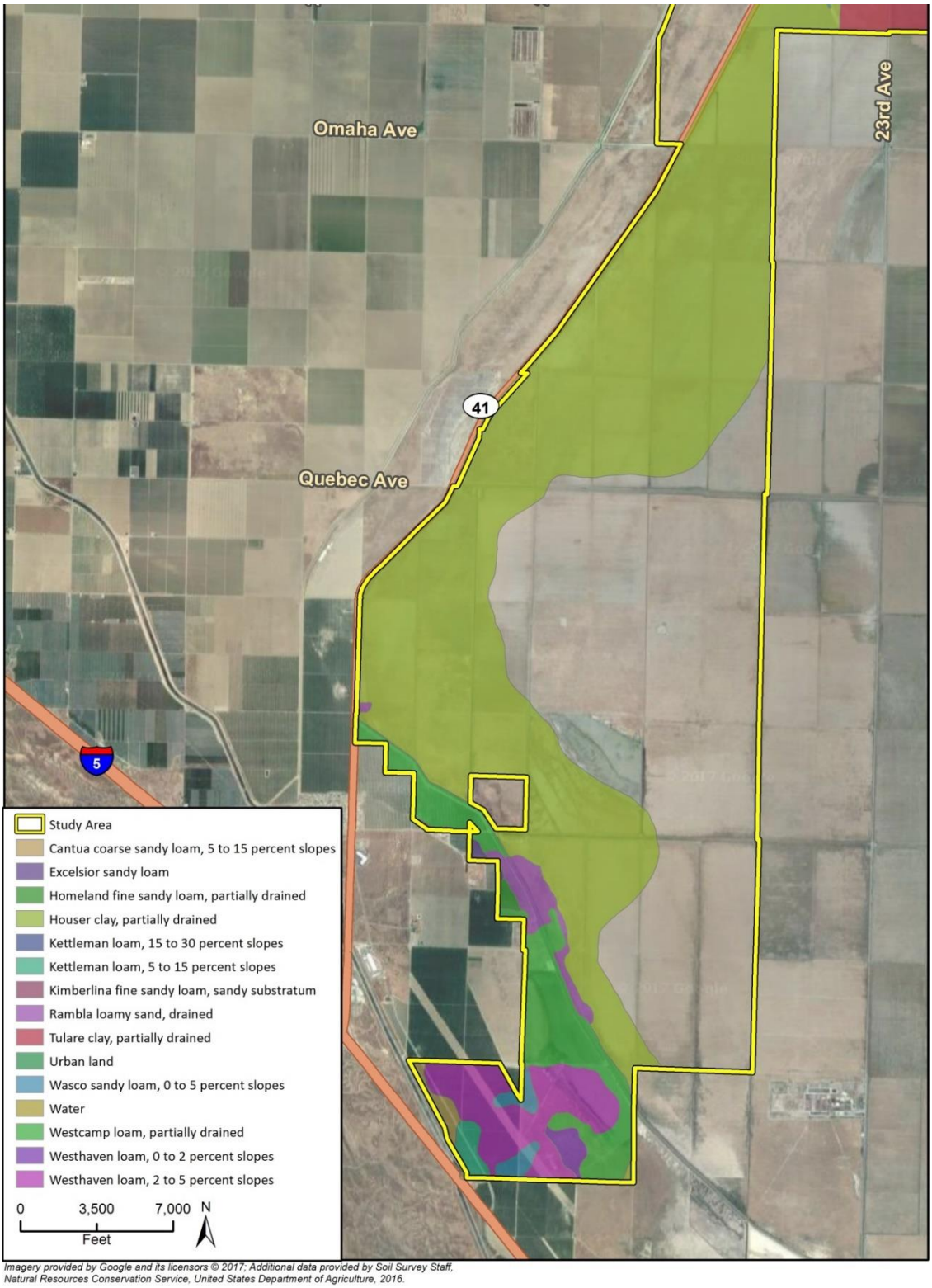


Figure 3.5-7: USDA Soil Map Units



Special Status Species

For the purpose of this EIR, special status species are those plants and animals listed, proposed for listing, or candidates for listing as threatened or endangered by the USFWS or National Marine Fisheries Service (NMFS) under the Federal Endangered Species Act (FESA); those listed or proposed for listing as rare, threatened, or endangered by the CDFW under the California Endangered Species Act (CESA); animals designated as "Species of Special Concern (SSC)" or "Fully Protected" by the CDFW; and plants with a California Rare Plant Rank (CRPR) of 1 or 2 which are defined as:

- Rank 1A = Plants presumed extinct in California;
- Rank 1B.1 = Rare or endangered in California and elsewhere; seriously endangered in California (over 80 percent of occurrences threatened/high degree and immediacy of threat);
- Rank 1B.2 = Rare or endangered in California and elsewhere; fairly endangered in California (20-80 percent occurrences threatened);
- Rank 1B.3 = Rare or endangered in California and elsewhere, not very endangered in California (<20 percent of occurrences threatened or no current threats known); and
- Rank 2 = Rare, threatened or endangered in California, but more common elsewhere.

Special Status Plant Species

Based on review of the CNDDB records for the *Kettleman City, Westhaven, Stratford, Stratford SE,* and *Los Viejos, California* USGS 7.5-minute quadrangles and the surrounding quadrangles (*Guernsey, Hanford, Lemoore, Vanguard, Huron, La Cima, Kettleman Plain, Pyramid Hills, Avenal Gap, West Camp, Dudley Ridge, Hacienda Ranch NW, El Rico Ranch*, and *Calflax, California*), results from the California Native Plant Society (CNPS) Online *Inventory of Rare and Endangered Plants of California* (CNPS, 2017a); the IPaC (USFWS, 2017a) website; and literature review, 11 special status plant species were identified to occur regionally. Of these, records for five species are reported within 10 miles of the Project area (**Figure 3.5-7**). Federal and state Endangered Species Acts and the CRPR system were used in classifying the species listed below.

Table 3.5-3 summarizes habitat requirements and evaluates potential for each species to be present on the Project area. The majority of the site has been plowed or otherwise graded in the past to support agricultural operations, and the potential for special status plants is low. Annual grassland, salt bush scrub, and some wetland areas may provide potential habitat where these areas have not been recently disturbed. No special status plants were observed in the Study Area during field surveys; however, protocol botanical surveys were not completed in areas that retain potential habitat.

Figure 3.5-8: CNDDB Occurrences within 10 Miles of the Project Area

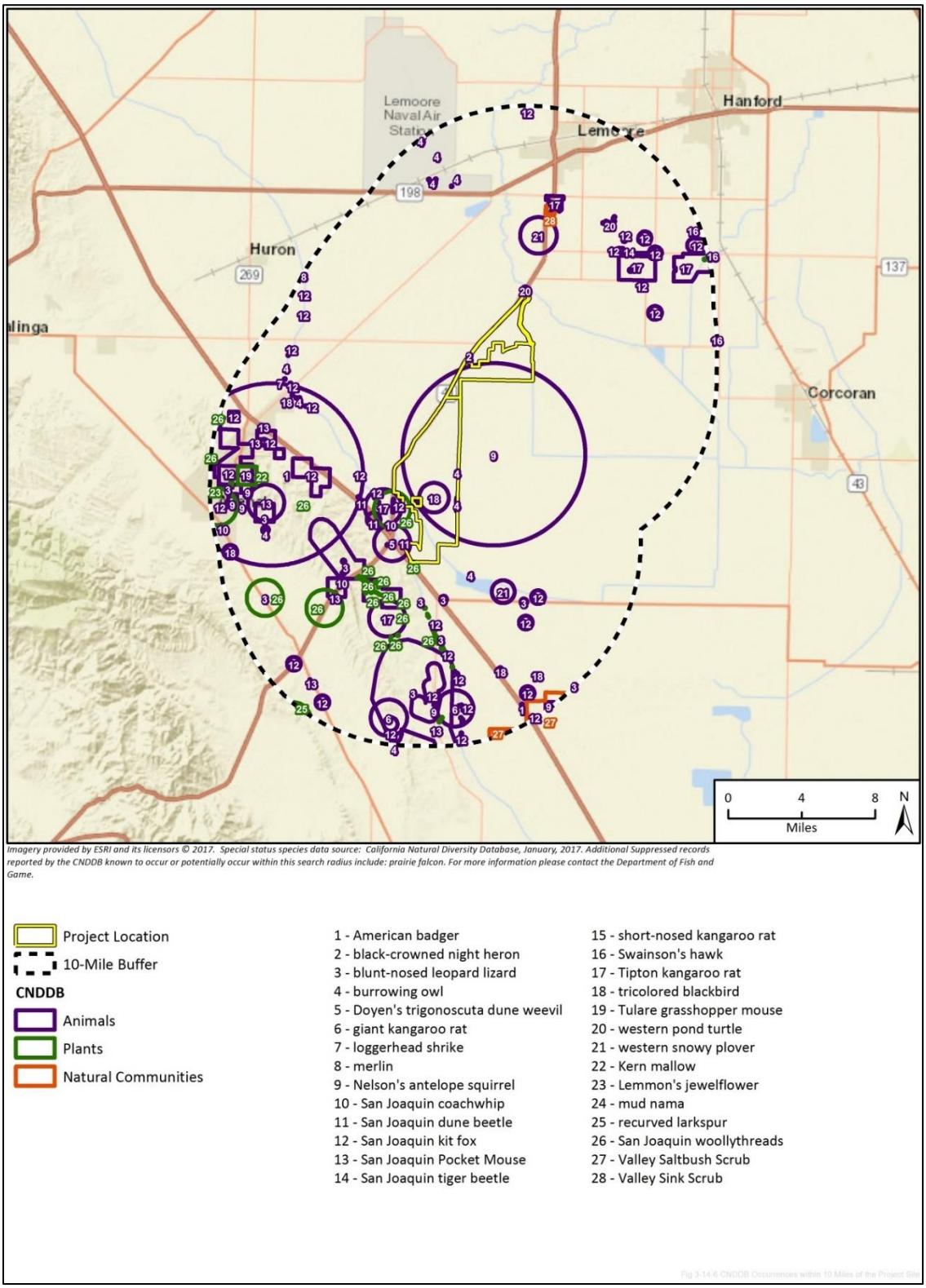


Table 3.5-4 Special Status Plant Species Known or with Potential to Occur Within the Project Area

Scientific Name	Status Fed/State ESA G-Rank/S-Rank CRPR	Habitat Requirements	Potential for Impact	Rationale
Atriplex coronata var. *vallicola* Lost Hills crownscale	-- / -- G4T2 / S2 1B.2	Annual herb. Blooms Apr-Aug. Chenopod scrub, valley and foothill grassland, vernal pools. In powdery, alkaline soils that are vernally moist with *Frankenia*, *Atriplex* spp. And *Distichlis*. Elevation: 0-605m (0-1,985ft).	Low	Low potential to occur due to land agricultural use. No occurrences are reported within 10 miles of Project area.
California macrophylla round-leaved filaree	-- / -- G2 / S2 1B.1	Annual herb. Blooms Mar-May. Cismontane woodland, valley and foothill grassland. Clay soils. Elevation: 15-1,200m (50-3,935ft).	Low	Low potential to occur due to land agricultural use. No occurrences within 10 miles of Project area.
Caulanthus californicus California jewelflower	FE / SE G1 / S1 1B.1	Annual herb. Blooms Feb-May. Chenopod scrub, valley and foothill grassland, pinyon-juniper woodland. Historical from various valley habitats in both the San Joaquin Valley and Carrizo Plain. Elevation: 65-900m (215-2,955ft).	Low	Low potential to occur due to land agricultural use. No occurrences within 10 miles of Project area.
Caulanthus lemmonii Lemmon's jewelflower	--/-- G3 / S3 1B.2	Annual herb. Blooms February through May. Pinyon and juniper woodland, valley and foothill grassland. 75-1,585 m.	Low	Low potential to occur due to land use practices. One occurrence from approximately 9.5 miles away in the hills west of Kettleman City is from an area of natural vegetation.
Cirsium crassicaule slough thistle	-- / -- G2 / S2 1B.1	Annual/perennial herb. Blooms May-Aug. Chenopod scrub, marshes and swamps, riparian scrub. Elevation: 3-100m (10-330ft).	Low	Low potential to occur due to land agricultural use and routine management of canals, ditches, and basins. No occurrences within 10 miles of Project area.

Delphinium recurvatum recurved larkspur	-- / -- G3 / S3 1B.2	Perennial herb. Blooms Mar-Jun. Chenopod scrub, valley and foothill grassland, cismontane woodland. On alkaline soils; often in valley saltbush or valley chenopod scrub. Elevation: 3-685m (10-2,245ft).	Low	Low potential to occur due to land agricultural use. Three occurrences within 10 miles of Project area.
Eremalche kernensis Kern mallow	FE/-- G2Q / S2 1B.1	Annual herb. Blooms January – May. Chenopod scrub, valley and foothill grassland. On dry, open sandy to clayey soils; usually within valley saltbush scrub; often at edge of balds. 65-1,295 m (213-4,250 ft).	Low	No potential to occur due to land use practices, and lack of suitable scrubland or grasslands. One occurrence within approximately 10 miles of the Project area.in natural areas.
Lasthenia glabrata ssp. coulteri Coulter's goldfields	-- / -- G4T2 / S2 1B.1	Annual herb. Blooms Feb-Jun. Coastal salt marshes, playas, valley and foothill grassland, vernal pools. Usually found on alkaline soils in playas, sinks, and grasslands. Elevation: 1-1,400 m (3-4,595 ft).	Low	Low potential to occur due to land agricultural use. No occurrences within 10 miles of Project area.
Monolopia congdonii San Joaquin woollythreads	FE / -- G2 / S2 1B.2	Annual herb. Blooms Feb-May. Chenopod scrub, valley and foothill grassland. Alkaline or loamy plains; sandy soils, often with grasses and within chenopod scrub. Elevation: 60-800 m (195-2,625 ft).	High	Reported from the southwest corner of the Study Area near the California Aqueduct. Elsewhere in the Study Area, low potential to occur due to land agricultural use. Multiple occurrences within 10 miles of Project area.
Nama stenocarpa Mud nama	--/-- G4G5 / S1S2 2B.2	Annual to short-lived perennial herb. Blooms January – July. Marshes and swamps. Lake shores, river banks, intermittently wet areas. 5-500 m (16-1,640 ft).	Moderate	Moderate potential to occur where wetlands are present and management regimes have not recently disturbed these areas. One occurrence approximately 10 miles from the Project area in a flood control ditch.

Tropidocarpum californicum King's gold	-- / -- G1 / S1 1B.1	Annual herb. Blooms Mar. Chenopod scrub. Alkaline, sandy clay soil. Elevation: ~65 m (215 ft).	Low	Low potential to occur based on lack of chenopod scrub habitat, disturbed site condition, and Project area location north of all known occurrences. No occurrences within 10 miles of Project area.

Lost Hills Crownscale

Lost Hills crownscale (*Atriplex coronata* var. *vallicola*) is a CRPR 1B.2 plant species. Lost Hills crownscale can be found in chenopod scrub, valley grassland and foothill grassland. No occurrences are reported within 10 miles of the Project area; however, saltbush scrub at the west edge of the Study Area may be appropriate for this species.

Round-Leaved Filaree

Round-leaved filaree (*California macrophylla*) is a CRPR 1B.1 plant species. Round-leaved filaree can occur in valley and foothill grassland with clay soils, a habitat observed within portions of the Project area. No occurrences are reported within 10 miles of the Project area; however, annual grasslands in the southwestern Study Area may be appropriate for this species.

California Jewelflower

California jewelflower (*Caulanthus californicus*) is a federally endangered and state endangered annual herb in the mustard family (Brassicaceae). It is endemic to California. California jewelflower is found in several plant communities, including annual grassland, chenopod scrub, valley and foothill grasslands, and cismontane juniper woodland and scrub. Primary soil types at known sites are subalkaline, sandy loams. loams, and occasionally, clay loams (CNPS, 2017a). Seed-dispersal agents are not known, but those that have been suggested for *Caulanthus* and related genera include gravity, seed-eating animals, wind, and water. California jewelflower probably forms a persistent seed bank (USFWS, 1998a; 2013a). Its historical range included the Carrizo Plain (San Luis Obispo County), the Cuyama Valley (Santa Barbara and Ventura Counties) and the San Joaquin Valley and western foothills (Fresno, Kern, King and Tulare Counties) south of Fresno. Of 63 total occurrences, 34 are presumed extant, including one population in Kings County. No populations are known within 10 miles of the Study Area. Given the lack of known populations nearby and the high-level disturbance in the Study Area, this species is unlikely to occur onsite under current land use practices.

Lemmon's Jewelflower

Lemmon's jewelflower (*Caulanthus lemmonii*) is a CRPR 1B.2 plant species. Lemmon's jewelflower may exist in pinyon juniper woodland and valley and foothill grasslands. Due to current land use practices, there is no suitable habitat for Lemmon's Jewelflower on the Project area. Seed-dispersal agents are not known. One population is reported within 10 miles of the Study Area, near Avenal (Occurrence 85). Given the distance to known populations and the high-level disturbance in the Study Area, this species is unlikely to occur onsite under current land use practices.

Slough Thistle

Slough thistle (*Cirsium crassicaule*) is a CRPR 1B.1 plant species. Slough thistle can occur in chenopod scrub, marshes and swamps, and riparian scrub. Saltbush scrub and seasonal wetlands found on portions of

the Project area provide potentially suitable habitat; however, these areas are highly disturbed and have limited capacity to support special status plants. No populations are known within 10 miles of the Study Area. Given the lack of known populations nearby and the high level disturbance in the Study Area, this species is unlikely to occur onsite under current land use practices.

Recurved Larkspur

Recurved larkspur (*Delphinium recurvatum*) is a CRPR 1B.2 plant species. Recurved larkspur is usually found in alkaline soils; often in valley saltbush or valley chenopod scrub. Three occurrences are known within 10 miles of the Study Area, including sites near Guernsey and Avenal. Some potentially suitable habitat is present in saltbush scrub. Given the lack of known populations nearby and the high level of disturbance in the Study Area, this species is unlikely to occur onsite under current land use practices.

Kern Mallow

Kern mallow (*Eremalche kernensis*) is federally listed as endangered, and ranked CRPR 1B.1. The original species description reports range limited to the Temblor Valley of western Kern County between Buttonwillow and McKittrick (Lokern area); however, taxonomic studies clarified the species is more widespread, with a historical distribution that includes Kings County (USFWS, 2013b). This species occurs on alkali flats and eroded hillsides of the southern San Joaquin Valley and adjacent areas of California, and ranges from 240 to 5,000 feet in elevation in alkaline soils ranging from sandy loam to clay. At lower elevations up to 2,000 feet, Kern mallow occurs in grassland and saltbush scrub habitat often under and around *Atriplex* (saltbush) species in sites with scattered shrub cover. Kern mallow occasionally invades disturbed sites when seed sources are present on adjacent undisturbed sites (CSU-U, 2017). Seed dispersal agents are unknown but likely include animals and wind. Seeds fall from the fruit as soon as mature and are capable of germinating the following growing season, although some remain ungerminated; viability in the soil seedbank is unknown (Mazer et al., 1993). One occurrence is reported within 10 miles of the Project area, west of the site from a single collection in 1973 near Avenal. Given the lack of known populations nearby and the high level disturbance in the Study Area, this species is unlikely to occur onsite under current land use practices.

Coulter's Goldfields

Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*) is an annual herb that is a CRPR 1B.1 plant species. Coulter's goldfields are usually found on alkaline soils in playas, sinks, marshes, vernal pools, and sometimes grasslands. Annual grasslands and seasonal wetlands with alkaline soils that provide marginally suitable habitat are present within portions of the Project area. Seed dispersal agents are unknown. Given the lack of known populations nearby and the high level disturbance in the Study Area, this species is unlikely to occur onsite under current land use practices.

San Joaquin Woollythreads

San Joaquin woollythreads (*Monolopia congdonii*) is federally listed as endangered, and ranked CRPR 1B.2. This annual herb is in the sunflower family (Asteraceae). San Joaquin woollythreads are known to occur in non-native grassland, valley saltbush scrub, interior coast range saltbush scrub, and Upper Sonoran subshrub scrub. This species occurs in sandy, sandy loam, or silty soils with neutral to subalkaline pH[1] that were deposited in geologic times by flowing water. In the most recent Five-Year Review, the USFWS reports 66 presumed extant occurrences in Fresno, Kings, Kern, San Benito, San Luis Obispo, and Santa Barbara Counties. Key areas supporting populations identified for species recovery include the Carrizo Plain-Elkhorn Plain, Jacalitos Hills, Kettleman Hills, Lost Hills, Panoche Hills, and the San Joaquin Valley floor. Dispersal agents are unknown, but wind, water and animals may aid with seed dispersal (USFWS,

[1] Potential of Hydrogen is a logarithmic scale used to describe the acidity or alkalinity of a solution.

2010b; 1998a). Multiple occurrences are reported from just west of the Study Area, some of which have not been verified in over twenty years. One occurrence overlaps the Study Area adjacent to the California Aqueduct on its east side (Occurrence 86), though the species was not found during update surveys conducted in 2013, a drought year. This species could be present in some Project areas.

Mud Nama

Mud nama (*Nama stenocarpa*) is a CRPR 2B.2 plant species. Mud nama may occur in marshes and swamps, lake shores, river banks, and in areas where wetlands are present. One occurrence is reported within 10 miles of the Study Area in a flood control channel. Suitable habitat for mud nama occurs on the Project area where sites remain wet for long enough duration and where maintenance actions have not recently removed vegetation.

King's Gold

King's gold (*Tropidocarpum californicum*) is a CRPR 1B.1 plant species known only from Kings and Kern Counties. King's gold is usually found on alkaline, sandy clay soils in *Atriplex* scrub habitats. Alkaline soils are present within portions of the Project area; however, all known occurrences are south of the Study Area, and the species is not known to occur within 10 miles of the Study Area. Seed dispersal agents are unknown. Given the lack of known populations nearby and the high level disturbance in the Study Area, this species is unlikely to occur onsite under current land use practices.

Sensitive Plant Communities

The CDFW has compiled a list of sensitive plant or vegetation communities in the CNDDB based on their rarity and threat of development (CDFW, 2010). Sensitive vegetation communities known to occur within 10 miles of the Project area include valley saltbush scrub and valley sink scrub (**Figure 3.5-7**). The disturbed saltbush scrub is similar to the valley saltbush scrub recognized in the CNDDB and in the CDFW Hierarchical List of Terrestrial Natural Communities (CDFW 2010), but is degraded by past disturbances and represents a remnant fragment cutoff by an interstate, the California Aqueduct to the west, and orchards to the east. The Project area has been degraded from its native condition through encroachments, primarily to support agricultural operations, as well as nearby major transportation corridors. These land modifications have reduced the extent and quality of native vegetation communities, including saltbush scrub, and have introduced non-native invasive species. An isolated area of marginal saltbush scrub habitat exists along the western portion of the Kettleman Reservoir next to the California Aqueduct. Wetlands are discussed above. No other sensitive natural communities were identified onsite.

Special Status Wildlife Species

A query of the CDFW (2017) CNDDB, was conducted to obtain comprehensive information regarding state and federally-listed species as well as other special status species considered to have potential to occur within the *Avenal Gap, Calflax, Dudley Ridge, El Rico Ranch, Guernsey, Hacienda Ranch NW, Hanford, Huron, Kettleman City, Kettleman Plain, La Cima, Lemoore, Los Viejo, Pyramid Hills, Stratford, Stratford SE, Vanguard, West Camp,* and *Westhaven* California USGS 7.5-minute topographic quadrangles. The results of the database query were compiled into Table 3.5-4. (Note that for CNDDB mapping purposes, a 10-mile search radius was used). Also, included in the table are special status species that were observed during the reconnaissance survey as well as species that are known to occur regionally.

Twenty-one special status wildlife species were identified by the CNDDB query, were observed during the reconnaissance survey or are otherwise known to occur in the region (**Table 3.5-4** and **Figure 3.5-7**). Four of these special status species listed in **Table 3.5-4** were observed during surveys conducted for the proposed Project: burrowing owl (*Athene cunicularia*), Swainson's hawk (*Buteo swainsoni*), loggerhead shrike (*Lanius ludovicianus*), and white-tailed kite (*Elanus leucurus*) as shown in **Figure 3.5-8** (Rincon

Consultants, 2017a). Below is a discussion of each those special status species that are known to occur or have potential to occur within the Study Area. Potential for occurrence was determined by an assessment of habitat suitability and taking into account past and present observations. The Study Area does not occur within federally-designated critical habitat for federally-listed wildlife species.

Figure 3.5-9: Wildlife Observations

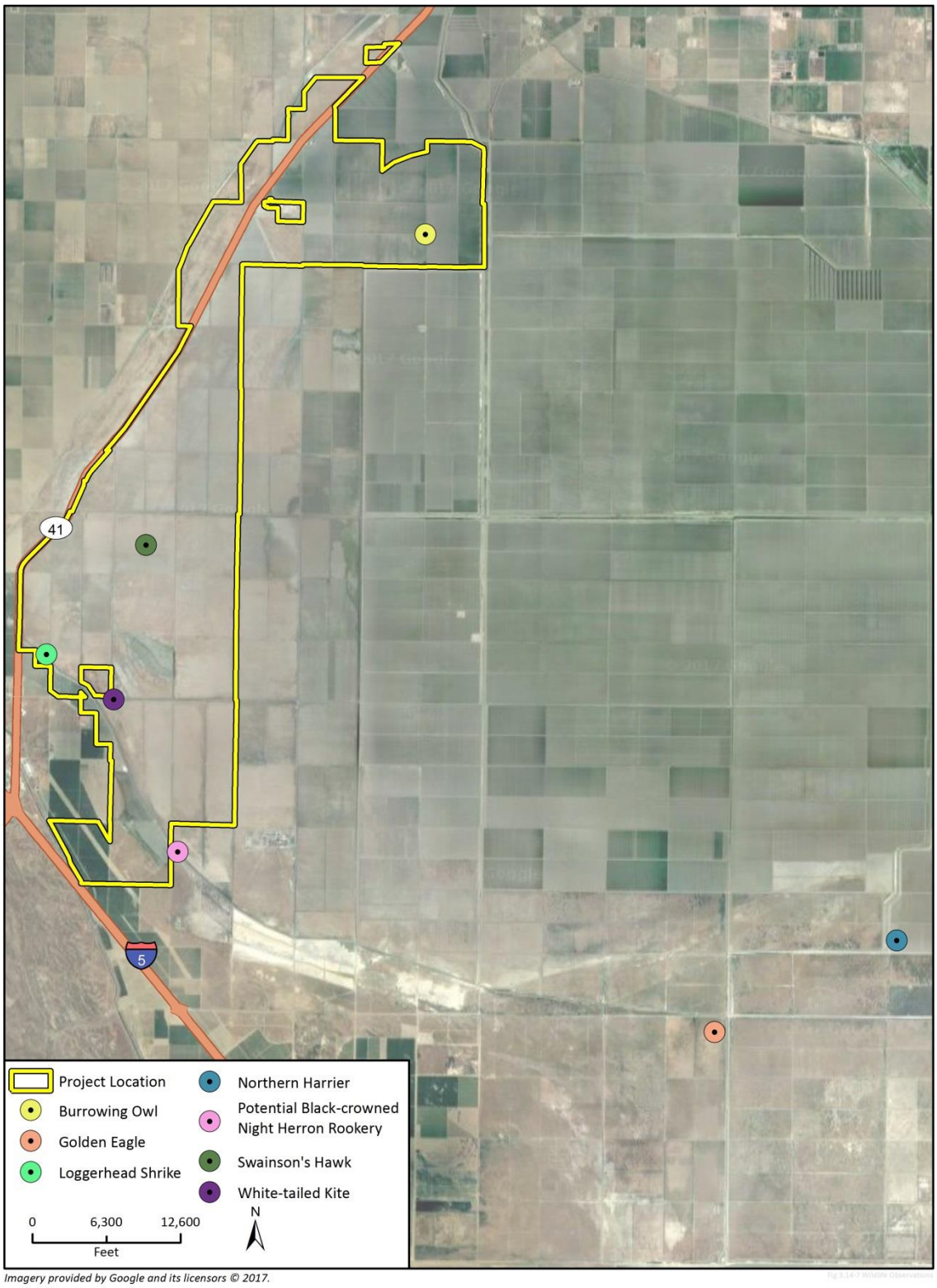


Table 3.5-5 Special Status Wildlife Species Known or with Potential to Occur Within the Project Area

Scientific Name	Status Fed/State ESA CDFW G-Rank/S-Rank	Habitat Requirements	Potential for occurrence	Rationale
Amphibians				
Spea hammondii western spadefoot	-- / -- SSC G3 / S3	Occurs primarily in grassland habitats, but can be found in valley-foothill hardwood woodlands. Vernal pools are essential for breeding and egg-laying.	Moderate	No occurrences within 10 miles of Project area, however suitable habitat may exist on the Project area.
Reptiles				
Emys marmorata western pond turtle	-- / -- SSC G3G4 / S3	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, below 6,000 feet elevation. Need basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.3 mile from water for egg-laying.	High	Two occurrences within 10 miles of Project area, including one occurrence within the South Fork of the Kings River where it enters the Project area at SR 41.
Gambelia sila blunt-nosed leopard lizard	FE / SE FP G1 / S1	Resident of sparsely vegetated alkali and desert scrub habitats, in areas of low topographic relief. Seeks cover in mammal burrows, under shrubs or structures such as fence posts; they do not excavate their own burrows.	Moderate	Multiple occurrences within 10 miles of Project area and marginal suitable habitat potentially exist within the alkali sink areas of the Project area near its west edge.
Masticophis flagellum ruddocki San Joaquin coachwhip	-- / -- SSC G5T2T3 / S2?	Open, dry habitats with little or no tree cover. Found in valley grassland and saltbush scrub in the San Joaquin Valley. Needs mammal burrows for refuge and oviposition sites.	High	Three occurrences within 10 miles of Project area and marginal suitable habitat exist within the Project area.

Birds				
Agelaius tricolor tricolored blackbird	-- / SE SSC G2G3 / S1S2	Highly colonial species, most numerous in San Joaquin Valley and vicinity. Largely endemic to California. Requires open water, protected nesting substrate, and foraging area with insect prey within a few km of the colony.	High	Multiple occurrences within 10 miles of Project area, including CNDDB occurrence #679 at southern portion of the proposed Kettleman Reservoir. Suitable habitat exists within the Project area when sufficient water is present and tall emergent vegetation is present.
Aquila chrysaetos golden eagle	-- / -- FP / WL G5 / S3	Rolling foothills, mountain areas, sage-juniper flats, and desert. Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.	High (foraging)	Observed adjacent to the Project area. Suitable nesting habitat occurs within 10 miles of the Project area; no suitable nest trees in the Study Area.
Athene cunicularia burrowing owl	-- / -- SSC G4 / S2	Open, dry annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	Present	Observed on the Project area.
Buteo swainsoni Swainson's hawk	-- / ST -- G5 / S3	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or lines of trees. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	Present	Observed on the Project area.
Charadrius alexandrinus nivosus western snowy plover	FT / -- SSC G3T3 / S2	Sandy beaches, salt pond levees and shores of large alkali lakes. Needs sandy, gravelly or friable soils for nesting.	Moderate	Three occurrences within 10 miles of Project, with the nearest 2.9 miles southeast of the Project area. Marginal suitable habitat exists on the Project area.

Circus cyaneus Northern Harrier	-- / -- SSC G5 / S3	Mostly found in flat, or hummocky, open areas of tall, dense grasses, moist or dry shrubs, and edges for nesting, cover, and feeding.	Present (foraging)	Observed adjacent to the Project area. Potentially suitable nesting habitat occurs in the Study Area.
Elanus leucurus white-tailed kite	-- / -- FP / WL G5 / S3S4	Forages in undisturbed, open grasslands, meadows, farmlands and emergent wetlands. Soars, glides, and hovers less than 30 meter (100 feet) above ground in search of prey.	Present	Observed on the Project area.
Haliaeetus leucocephalus Bald eagle	-- / SE FP G5 / S3	Ocean shore, lake margins, and rivers for both nesting and wintering. Most nests within 1 mile of water. Nests in large, old-growth, or dominant live tree with open branches, especially ponderosa pine. Roosts communally in winter.	Foraging only	No occurrences within 10 miles of the Project area and no nesting habitat is present on the Project area.
Xanthocephalus yellow-headed blackbird	--/-- SSC G5 / S3	Nests in freshwater emergent wetlands with dense vegetation & deep water. Often along borders of lakes or ponds.	Moderate	The nearest CNDDB occurrence of this species is approximately 2.3 miles northeast of the Study Area. Suitable nesting habitat occurs within the Study Area associated within canals, ditches, or basin/ wetland areas.
Lanius ludovicianus loggerhead shrike	-- / -- SSC G4 / S4	Broken woodlands, savannah, pinyon-juniper, Joshua tree, and riparian woodlands, desert oasis, scrub and washes. Prefers open country for hunting, with perches for scanning, and fairly dense shrubs and brush for nesting.	Present	Observed on the Project areas
Mammals				
Ammospermophilus nelsoni Nelson's antelope squirrel	-- / ST -- G2 / S2	Western San Joaquin Valley from 200-1200 feet elevation. On dry, sparsely vegetated loam soils. Dig burrows or use k-rat burrows. Need widely scattered shrubs, forbs and grasses in broken terrain with gullies and washes.	Moderate	This species occurs within 10 miles of Project area, and an imprecise older record overlaps the Study Area. Suitable habitat occurs on the Project area.

Dipodomys ingens Giant kangaroo rat	FE/ FE -- G1G2 / S1S2	Annual grasslands on the western side of the San Joaquin Valley, marginal habitat in alkali scrub. Need level terrain & sandy loam soils for burrowing.	Moderate	Two occurrences within 10 miles of Project area. Suitable habitat occurs on the Project area.
Dipodomys nitratoides exilis Fresno kangaroo rat	FE / SE -- G3TH / SH	Alkali sink-open grassland habitats in western Fresno County. Species usually found in areas of bare alkaline clay-based soils subject to seasonal inundation, with more friable soil mounds around shrubs and grasses.	None	The Study Area is located outside of the range of the species. This species is not expected to occur.
Dipodomys nitratoides Tipton kangaroo rat	FE / SE -- G3T1T2 / S1S2	Saltbrush scrub and sink scrub communities in the Tulare Basin of the southern San Joaquin Valley. Needs soft friable soils which escape seasonal flooding. Digs burrows in elevated soil mounds at bases of shrubs.	Moderate	This species occurs within 10 miles of Project area. Suitable habitat occurs on the Project area.
Onychomys torridus tularensis Tulare grasshopper mouse	-- / -- SSC G5T1T2 / S1S2	Hot, arid valleys and scrub deserts in the southern San Joaquin Valley. Diet almost exclusively composed of arthropods, therefore needs abundant supply of insects.	Moderate	This species occurs within 10 miles of Project area, with the nearest occurrence approximately 1.8 miles west of the proposed Kettleman Reservoir. Suitable habitat occurs on the Project area.
Taxidea taxus American badger	-- / -- SSC G5 / S3	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs sufficient food, friable soils and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	Moderate	Two occurrences within 10 miles of Project area, with the nearest occurrence approximately 1.7 miles west of the proposed Kettleman Reservoir. Suitable habitat occurs on the Project area. Expected to be common throughout the region.

Vulpes macrotis mutica San Joaquin kit fox	FE / ST -- G4T2 / S2	Annual grasslands or grassy open stages with scattered shrubby vegetation. Need loose-textured sandy soils for burrowing, and suitable prey base.	High	Multiple occurrences within 10 miles of Project area, with the nearest occurrence approximately 0.5 mile west of the proposed Kettleman Reservoir. Suitable habitat occurs on the Project area.

FT = Federally Threatened
FC = Federal Candidate Species
FE = Federally Endangered
FS=Federally Sensitive
SE = State Endangered
ST = State Threatened
SR = State Rare
SS=State Sensitive
G-Rank/S-Rank = Global Rank and State Rank as per NatureServe and CDFW's CNDDB RareFind5
SSC = CDFW Species of Special Concern
FP = Fully Protected
WL = Watch List
km = kilometer

San Joaquin Kit Fox

The San Joaquin kit fox (*Vulpes macrotis mutica*) is a federally endangered and state threatened species that is endemic to California, west of the Sierra Nevada Mountains. This species occurs in the San Joaquin Valley generally from the Sacramento area south to the southern end of the San Joaquin Valley, in the Carrizo Plain and Panoche Valley, and also in northern San Luis Obispo County, north up through the Salinas Valley. Its diet consists of black-tailed jackrabbits, desert cottontails, rodents (especially kangaroo rats [*Dipodomys* spp.] and California ground squirrels), insects, reptiles, some birds, bird eggs, and vegetation. The species is most commonly found in gently sloping to relatively flat terrain vegetated with grasslands and open scrub as well as fallow agricultural lands. It may occur on a limited basis in areas under less intense agricultural production, such as dry-land grain farming and orchards, and is known to occur in urban areas. The nearest CNDDB occurrence of this species is at State Route (SR) 41, approximately 0.5 mile west of the proposed Kettleman Reservoir (CDFW, 2017a) (**Figure 3.5-7**). This species has potential to occur in both the proposed Kettleman Reservoir and active farmland in the vicinity of the proposed conveyance from South Fork Canal. Within the Study Area, the fallow field/pasture, valley saltbush scrub, annual grassland as well as dirt berms are suitable areas for den construction, foraging and dispersal. Areas of active agriculture, including orchards, provide marginally suitable habitat due to frequent disturbance and human activity and would predominantly serve as foraging or movement areas only (USFWS, 1998b).

Blunt-Nosed Leopard Lizard

Blunt-nosed leopard lizard (*Gambelia sila*) is both federally and state listed as endangered. It is also designated as a state fully protected species. This species historically inhabited the majority of the San Joaquin Valley and adjacent plains, extending from Stanislaus County in the north to the Tehachapi Mountains at the southern terminus of the valley (ESRP, 2002). The lizard has been extirpated from the majority of its former range and is now limited to undeveloped habitats in widely scattered populations.

The blunt-nosed leopard lizard typically occurs in arid, sparsely vegetated areas with moderate to gentle slopes such as semiarid grasslands, alkali flats, saltbush scrub and washes. In addition, grasslands that are grazed on a limited basis can offer suitable habitat for this lizard if the livestock reduce the vegetation density and maintain the open habitat preferred by the lizard (USFWS, 1985).

The nearest CNDDB historic occurrence of this species is along the California Aqueduct, approximately 77 feet west of the proposed Aqueduct Intertie turn-in/turn-out structure (CDFW, 2017a) (**Figure 3.5-7**). Because of the Kettleman Reservoir's current and historical active agricultural operation and the repetitive disking of the Project area since the 1950s, suitable habitat does not occur within the proposed Kettleman Reservoir; however, potentially suitable habitat for the lizard does occur southwest of the Kettleman Reservoir, between the California Aqueduct and the Blakeley Canal where the Project's proposed Aqueduct Intertie termination would be located. The Aqueduct Intertie turn-in/turn-out structure would be sited on 0.97 acres of degraded valley saltbush scrub habitat and approximately 6.03 acres of an orchard. Development of the proposed Aqueduct Intertie pipelines from the California Aqueduct turn-in/turn-out structure to the Kettleman Reservoir would require development of up to 19 acres of an orchard, up to 5 acres of ruderal habitat within a PG&E easement, and up to 57 acres of non-native grassland habitat.

The area of valley saltbush scrub habitat where the proposed Aqueduct Intertie turn-in/turn-out structure would be sited is associated with the previously-mentioned nearest CNDDB occurrence. In addition to the valley saltbush scrub habitat, the ruderal habitat within the PG&E easement and the annual grassland habitat within the southwestern portion of the proposed Project area could provide a limited amount of suitable habitat for this species. Although recently-fallow fields within the proposed Kettleman Reservoir have some characteristics of suitable habitat where active grazing is reducing vegetation density to create an open habitat, the potential to support occurrence of this species is currently limited by the low availability of cover (small mammal burrows) due to past active agricultural activities. Prior to the recent drought, these areas were actively farmed. The Blakeley Canal is effectively a barrier to movement of blunt-nosed leopard lizard into the eastern portions of the Study Area from potentially extant populations west and south of the Project area, and only a few crossings exist separated by several miles. Therefore, this species was determined to only have the possibility of occurring on the Project area in the 0.97 acre of degraded valley saltbush scrub habitat, 4.82 acres of ruderal habitat within a PG&E easement, and 57.33 acres of nonnative grassland habitat west of the Blakeley Canal.

Giant Kangaroo Rat

The giant kangaroo rat (*Dipodomys ingens*) is a federally endangered and state endangered species endemic to California. The species was once widely distributed across continuous habitat in the San Joaquin Valley, Carrizo Plain, and Cuyama Valley (Linzey and NatureServe, 2008; USFWS, 2010a). Currently, the species is recognized as being fragmented into six isolated geographic regions located in the Panoche region, Kettleman Hills, San Juan Creek Valley, western Kern County, Carrizo Plain, and Cuyama Valley. The Kettleman Hills population is the closest giant kangaroo rat unit to the Project area, and is located in the foothills west of I-5, approximately 7 miles southwest of the Project area.

The habitat of giant kangaroo rats consists of gently sloping and level piedmont plains and (formerly) areas supporting saltbush and perennial grasses; habitat now is dominated by introduced annuals, with many shrubs in some areas. The species occupies areas of sparse vegetative cover and well-drained soils with slopes generally less than 9% (Williams and Kilburn, 1991) and sometimes up to 22% (USFWS, 1998a), often in areas that are heavily grazed by cattle and sheep (Williams and Kilburn, 1991). The species prefers semi-arid slopes at the head of draws in barren, shrubless areas, with loose, easily diggable, sandy loam soils, and is found in underground burrows when inactive. It is absent from areas continuously in dry-land cultivation and from irrigated fields but may recolonize fallow dry-land grain fields if there are colonies on uncultivated land nearby (Williams and Kilburn, 1991). The following habitats are listed in order of decreasing favorability: 1) annual grassland association in areas with less than five to six inches annual rain, and level to gently sloping ground, 2) alkali desert scrub association in areas with less than five to six inches annual rain, sandy loam soils, and level to gently sloping ground, 3) friable soils of sand, loam, clay loam or gravelly in areas with the above characteristics, and 4) slopes of 10 to15 degrees with the above characteristics and located near colonies in more favorable habitats.

There are two CNDDB occurrences of this species within 10 miles of the Study Area, approximately seven miles south of the proposed Kettleman Reservoir (CDFW, 2017a) (**Figure 3.5-7**). The Study Area contains suitable habitat for this species, specifically the annual grassland and valley saltbush scrub habitat areas mapped in the portion of the Study Area containing the proposed Kettleman Reservoir. Areas mapped as fallowed field/pasture within the Study Area could also provide suitable habitat for this species considering proximity to annual grassland habitat in the southern portion of the Study Area.

Tipton Kangaroo Rat

The Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*) is a federally endangered and state endangered species. Threats to extant populations are primarily from continuing conversion of native habitats to cultivated agriculture, urbanization and other land developments. Current populations are found primarily in the Tulare Basin of the southern San Joaquin Valley (CDFG, 2009). The Tipton kangaroo rat is one of three subspecies of the nocturnal San Joaquin kangaroo rat (*D. nitratoides*), the other two species being the short-nosed kangaroo rat (*D. nitratoides brevinasus*) and the Fresno kangaroo rat (*D. nitratoides exilis*). Suitable habitat includes valley sink scrub and herbaceous habitats with scattered shrubs. Kangaroo rats use nearly level terrain with sandy loam soils for excavation of burrows.

A small portion of the western edge of the proposed Kettleman Reservoir is located within CNDDB occurrence #90 for this species (CDFW, 2017a) (**Figure 3.5-7**). The occurrence is a historical museum record and indicates the exact location is unknown. Locality information only refers to the Kettleman Hills. Like the giant kangaroo rat, the Study Area contains suitable habitat for this species specifically the annual grassland and valley saltbush scrub habitat areas mapped in the portion of the Study Area containing the proposed Kettleman Reservoir. Areas mapped as fallowed field within the Study Area could also provide suitable habitat for this species considering proximity to annual grassland habitat in the southern portion of the Study Area.

Nelson's Antelope Squirrel

Nelson's antelope squirrel (*Ammospermophilus nelsoni*) is state listed as threatened. Nelson's antelope squirrels live in relatively arid annual grassland, shrubland, and alkali sink habitat communities within the San Joaquin Valley and adjacent foothills. They are most numerous in areas with a sparse-to-moderate cover of shrubs such as saltbushes. The species may construct its own burrow or may occupy existing kangaroo rat burrows. The majority of the Study Area is located within CNDDB occurrence #311 for this species (CDFW, 2017a) (**Figure 3.5-7**). The locality information for the museum specimen associated with this occurrence is west side of Tulare Lake lakebed, east of Kettleman City. Valley saltbush scrub habitat mapped in the southern portion of the proposed Kettleman Reservoir provides suitable habitat for this species. In addition, annual grassland and fallowed field/pasture could provide suitable habitat for this species if a sufficient number of kangaroo rat or similar sized burrows are present as refuge from predation.

Swainson's Hawk

Swainson's hawk is a state threatened species. The historical breeding range of the Swainson's hawk in California included the Great Basin, Sacramento Basin San Joaquin Basin, the coast from Marin County to San Diego County, and scattered sites in the Mojave and Colorado Deserts (England et al., 1997). The species continues to breed across its entire historical range, but in significantly lower numbers than historically recorded. In the San Joaquin Valley, much of the native habitat has been converted to agricultural and urban uses, thereby limiting nesting and foraging opportunities for Swainson's hawk. This species is often found nesting in trees associated with scattered rural residences, particularly in relation to grasslands or dry-land grain fields. Throughout its range the species nests almost exclusively in trees, typically on the edges of woodlands adjacent to grass or shrubland habitat (England et al., 1997). The nearest CNDDB occurrence of this species is approximately 9.5 mile west of the Study Area (CDFW,

2017a) (**Figure 3.5-7**). One Swainson's hawk was observed foraging at the proposed Kettleman Reservoir location during reconnaissance surveys for the proposed Project (**Figure 3.5-8**). The Swainson's hawk was not observed nesting or exhibiting nesting behaviors that would indicate a nest was on-site. There is a low potential for this species to nest within the Study Area due to limitations in the availability of suitably large nest trees. The highest potential for Swainson's hawk nesting would be in the riparian vegetation just upstream of where the South Fork of the Kings River enters the Study Area and enters the South Fork Canal. The entire Study Area can also provide suitable foraging habitat for this species.

Tricolored Blackbird

The tricolored blackbird (*Agelaius tricolor*) is currently a state SSC. The species was given emergency listing status under the CESA in December 2014. This listing provided temporary (six-month) protection but was allowed to expire in June 2015. The species is a candidate for endangered status under the CESA. Tricolored blackbirds are found primarily in the San Joaquin Valley and in central and southern coastal areas of California. The species nesting colonies are typically located near freshwater in emergent vegetation, grain fields, or fallow fields. The species forages in open habitats such as grassland, agricultural fields, and pastures. The constructed basin in the southern portion of the proposed Kettleman Reservoir is the location of CNDDB occurrence #679 for this species (CDFW, 2017a) (**Figure 3.5-7**). This CNDDB occurrence indicates the location was a nesting location in 1995 and supported a large colony of tricolored black birds (approximately 7,000 individuals). The occurrence data indicates that no tricolored blackbirds were observed during additional visits to the basin during the nesting season in 1999 and 2014. Due to the anthropogenic influence on the hydrology of the constructed basin associated with the occurrence, the location's suitability for nesting for this species likely varies from year to year. The basin likely provides suitable nesting habitat for this species during years where there is high and consistent inputs of water and therefore higher prevalence of cattails that can be used as nest sites. The species could also nest in the vicinity of the basin if there is sufficient water as well as dense, tall herbaceous vegetation in adjacent areas that can be used for nesting. In addition, if sufficient water and suitably dense emergent vegetation such as cattails or surrounding upland vegetation occurs in any of the other basins, canals or ditches within the Study Area, they could also provide suitable nesting habitat for this species.

Yellow-headed Blackbird

Yellow-headed blackbird (*Xanthocephalus xanthocephalus*) is a state SSC. Similar to the tricolored blackbird, the yellow-headed blackbird breeds in shallow areas of marshes, ponds, and rivers. Nests are located in cattails, bulrushes, or reeds. The nearest CNDDB occurrence of this species is approximately 2.3 miles northeast of the Study Area (CDFW, 2017a) (**Figure 3.5-7**). The CNDDB occurrence indicates that nesting was observed. Considering the similarity of nesting habitat requirements to the tricolored blackbird, the canals, ditches, and basins/wetlands provide suitable habitat (including nesting) for this species if sufficient water and emergent vegetation are present.

Western Snowy Plover

The Pacific coastal population of western snowy plover (*Charadrius alexandrinus nivosus*) is listed as federally threatened and CDFW designates both the coastal and interior populations as a state SSC. The western snowy plover normally nests on coastal beaches above the high tide line, in sand pits, sparsely vegetated dunes, and within estuaries; although, they also occur inland in areas of salt ponds, levees, and shores of large alkali lakes. The species prefers sandy, gravelly or friable soils in which to construct a nest scrape. The nearest CNDDB occurrence of this species is approximately 2.9 miles southeast of the Study Area (CDFW, 2017a) (**Figure 3.5-7**). The occurrence consists of observations of nesting attempts in upland areas adjacent to an agricultural drainwater evaporation pond. Aquatic habitats in the form of basins/wetlands, ditches and canals occur within Study Area (as mapped in **Figure 3.5-4**). Suitable sandy

or gravelly soils for creation of a nest scrape in open habitats are present on-site. Upland areas in the vicinity of these aquatic areas would have the highest potential to support western snowy plover nesting.

White-tailed Kite

White-tailed kite is a state fully protected species. White-tailed kites may forage in undisturbed, open grasslands, meadows, farmlands, and emergent wetlands. This species typically nests in trees as small as 10 feet tall to upwards of 160 feet tall. Nest trees can be open-country trees growing in isolation, or at the edge of or within a forest. No white-tailed kite occurrences have been documented by the CNDDB within 10 miles of the Study Area, however an individual was observed foraging in the proposed Kettleman Reservoir near the constructed basin/wetland during the reconnaissance-level survey in May 2016. No indication of white-tailed kite nesting was observed within the Study Area during the reconnaissance survey, but the Study Area does support potentially suitable nest trees. Potentially suitable nest trees are located in association with existing developed areas, as well as the riparian areas where the South Fork of the Kings River enters the Study Area in the north. In addition, the entire Study Area provides foraging habitat for this species.

Golden Eagle

Golden eagle (*Aquila chrysaetos*) is a state fully protected species. No golden eagle occurrences have been documented by the CNDDB within 10 miles of the Study Area, however the species is known to occur regionally. Golden eagles occur in a variety of habitats within rolling foothills, mountains, sage-juniper flats, and desert. Nesting habitat consists of rocky cliffs or large trees. The Study Area provides suitable foraging habitat; however, no rocky cliffs or trees that are large enough to support golden eagle nesting occur within the Study Area.

Western Spadefoot

Western spadefoot (*Spea hammondii*) is a state SSC. No western spadefoot occurrences have been documented by the CNDDB within 10 miles of the Study Area, however, this species is known to occur regionally. The western spadefoot is almost completely terrestrial, entering water only to breed. Breeding pools that are suitable for breeding are those which do not contain bullfrogs, fish, or crayfish and that pond for at least thirty (30) days for successful completion of larval development (Morey and Reznick, 2004). Outside the breeding season, the western spadefoot spends the majority of the time underground by constructing burrows typically in open areas with sandy or gravelly soils in a variety of habitats in the vicinity of a suitable breeding pond.

Ponded or slow moving water within any of the ditches within the Study Area likely provide suitable breeding habitat for this species. In addition, any of the constructed basins/wetlands within the Study Area could provide suitable breeding habitat if sufficient water is present. The larger perennial canals within the Study Area likely preclude western spadefoot breeding due the presence of predators such as fish and crayfish. Potentially suitable upland habitat for movement can be found throughout the Study Area. In addition, any of the upland habitats within the Study Area containing suitable soils for constructing burrows could also be utilized as non-breeding aestivation habitat, especially those areas in close proximity to potentially suitable breeding habitat.

Northern Western Pond Turtle

Northern western pond turtle (*Actinemys* [=*Emys*] *marmorata*) is a state SSC. Northern western pond turtles can be found in multiple freshwater habitats including ponds, lakes, rivers, streams, creeks, marshes, and ditches. Within aquatic habitat, this species requires downed logs, rocks, mats of vegetation, or exposed banks for basking. This species lays its eggs in nests that are dug along the banks of streams or other uplands in sandy, friable soils. Upland movements can be quite extensive and individuals have been recorded

nesting or overwintering hundreds of meters from aquatic habitats. The typical nesting season is usually from April through August; however, variation exists depending upon geographic location. The Study Area contains one CNDDB occurrence for this species (CDFW, 2017a) (**Figure 3.5-7**). The CNDDB occurrence is located within the South Fork of the Kings River where it enters the Study Area at SR 41. Any of the ditches or canals within the Study Area could provide suitable habitat for this species. In addition, the constructed basins/wetlands could provide suitable habitat if water of sufficient depth persisted for an extended period of time. The Study Area also contains suitable upland habitat for this species, especially near aquatic habitat that can be utilized for upland movements. Nesting habitat within the Study Area is limited due to the openness of the vegetation communities and lack of nest cover such as duff material. Nesting could be possible in the understory of the riparian vegetation associated with the South Fork of the Kings River at the northern most portion of the Study Area.

San Joaquin Coachwhip

San Joaquin coachwhip (*Coluber* [=*Masticophis*] *flagellum ruddocki*) is a state SSC. This species occurs in open, dry, treeless habitats such as grasslands and saltbush scrub. This species is diurnal and will take refuge in rodent burrows, under shaded vegetation, and under surface objects. The nearest CNDDB occurrence of this species is along the California Aqueduct, approximately 1.2 miles north of the southern end of the proposed Kettleman Reservoir, where the Study Area is nearest to the California Aqueduct (CDFW, 2017a) (**Figure 3.5-7**). The majority of the Study Area consists of suitable habitat for this species. Specifically, the valley saltbush scrub, annual grassland, fallowed field and pastures within both the proposed Kettleman Reservoir and the vicinity of the proposed conveyance from South Fork are suitable habitat.

Tulare Grasshopper Mouse

Tulare grasshopper mouse (*Onychomys torridus tularensis*) is a state SSC. The species occurs in hot, arid grasslands and shrublands in the southern San Joaquin Valley. Its diet is almost exclusively composed of arthropods; therefore, one of the requirements of suitable habitat is that a sufficient arthropod prey base be present. The nearest CNDDB occurrence of this species is within the Kettleman Hills, approximately 1.8 miles west of the proposed Kettleman Reservoir (CDFW, 2017a) (**Figure 3.5-7**). Potentially suitable vegetation communities, not taking into account prey base, occur within Study Area. Specifically, the valley saltbush scrub, annual grassland, fallowed field and pastures within both the proposed Kettleman Reservoir and the vicinity of the proposed conveyance from South Fork Canal are suitable habitat.

American Badger

American badger (*Taxidea taxus*) is a state SSC. This species utilizes a wide variety of scrub, forest and grassland habitats with friable soils, and is expected to be common throughout the region. The nearest CNDDB occurrence of this species is within the Kettleman Hills, approximately 1.7 miles west of the proposed Kettleman Reservoir (CDFW, 2017a) (**Figure 3.5-7**). All upland areas within the Study Area can be utilized by this species for movement and foraging. Annual grassland, fallowed field/agriculture and salt bush scrub as well as dirt berms within the Study Area are suitable areas for den construction.

Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*) was removed from the federal endangered species list in 2008 but remains listed as both endangered and fully protected by the State of California. Ideal habitat for bald eagles is composed of remote, forested landscape with old-growth or mature trees and easy access to an extensive and diverse prey base. Bald eagles forage in fresh and salt water where fish are abundant and diverse. They build nests in tall, sturdy trees at sites that are in relatively close proximity to aquatic foraging areas and isolated from human activities. The Project area is absent of nesting and foraging habitat for this species.

Burrowing Owl

The burrowing owl is a state SSC. Burrowing owls prefer annual and perennial grasslands, typically with sparse or nonexistent tree or shrub canopies. In California, the species is found in close association with California ground squirrel burrows (*Otospermophilus beecheyi*), which provide individuals with year-round shelter and seasonal nesting habitat. Burrowing owls also use human-made structures such as culverts, debris piles, or openings beneath pavement as shelter and nesting habitat (CDFG, 1995). Three burrowing owl observations were made during field surveys in December 2016. Two of the observations were located within the vicinity of the proposed conveyance from South Fork Canal and the third in the central portion of the proposed Kettleman Reservoir. No nesting activity was observed; however, the Study Area contains suitable nesting and foraging habitat consisting of annual grassland, fallowed field/agriculture and salt bush scrub. California ground squirrels were observed within the Study Area during reconnaissance surveys indicating that potentially suitable burrows that can be used for nesting are present. California ground squirrel burrows constructed in dirt berms provide especially ideal locations for burrowing owl occupation.

Loggerhead Shrike

The loggerhead shrike is a state SSC. This species prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches. This species frequents open habitats with sparse shrub, tree and herbaceous cover containing suitable perches (including fence lines). The loggerhead shrike feeds mostly on large insects, but also feeds on small birds, mammals, amphibians, reptiles, fish, carrion, and various other invertebrates. Loggerhead shrike individuals were observed on the Project area during the reconnaissance-level surveys in May and December 2016. No nesting activity was observed in association with the observation. This species can use the valley saltbush scrub, annual grassland, and fallowed field/pasture as well as ruderal/disturbed areas for foraging. Nesting habitat could occur within any portion of the Study Area containing trees or shrubs.

Northern Harrier

Northern harrier (*Circus cyaneus*) is a state SSC. No northern harrier occurrences have been documented by the CNDDB within 10 miles of the Study Area, however, they are known to occur regionally. The northern harrier nests on the ground and usually in a dense clump of vegetation such as willows, grasses, sedges, reeds, bulrushes, and cattails. Northern harriers forage in a variety of open habitats including grassland, pasturelands, croplands, open floodplains and marshes. Suitable foraging habitat can be found throughout the Study Area. Suitable nesting habitat occurs within a large portion of the Study Area consisting of any of the herbaceous habitat types such as annual grassland, fallowed field/pasture, and ruderal areas. Areas within these habitat types where the vegetation is tall and dense would be provide ideal nesting locations.

Nesting Birds

The majority of the Study Area provides suitable habitat that can be utilized for nesting by bird species that would be afforded protection under the federal Migratory Bird Treaty Act and California Fish and Game Code. Any habitats found within the Study Area containing trees or shrubs are ideal areas for nesting. These habitats or land cover types include orchard, valley saltbush scrub, as well as individual trees within the fallowed field/pasture. Also, as discussed above, emergent vegetation or vegetation found adjacent to canals, ditches or basins can provide suitable nesting habitat for species such as the tricolored blackbird. Open habitats within the Study Area, such as annual grasslands and the fallowed field/pasture, could also provide suitable nesting habitat for ground nesting birds. In addition, the CNDDB contains an occurrence (#24) of a black-crowned night heron rookery located within the Blakeley Canal in the northwestern portion of the Study Area. During reconnaissance surveys, a large amount of black-crown night heron activity was

observed adjacent to the southeast corner of the Blakeley Reservoir (**Figure 3.5-8**) indicating the potential presence of a second rookery site.

Avian Botulism

Avian botulism is a paralytic disease caused by ingestion of a toxin produced by the bacteria *Clostridium botulinu*. Mortality to birds resulting from avian botulism has been observed occasionally in the San Joaquin Valley where large numbers of waterbirds congregate within areas where shallow, warm waters occur (DWR, 1999). Avian botulism outbreaks typically occur between late spring and early fall when optimal conditions fostering growth of the bacterium are ideal. Optimal environmental conditions tend to include a combination of shallow water, water temperatures ranging between 30° to 37° Celsius, and the presence of an energy source such as decaying organic matter or vertebrate and invertebrate carcasses (USGS, 1999). These environmental factors can result in lowering the dissolved oxygen content in the waterbody creating anaerobic conditions that in combination with the warm water and nutrient source, allow the bacterium to become active and produce toxin (USGS, 1999). Birds are most commonly affected by type C toxin and, to a lesser extent, type E toxin. Toxin ingestion in birds is either through ingesting the toxin directly, or by eating invertebrates (e.g. chironomids, fly larvae) that contain the toxin (USGS, 2016). A cycle of avian botulism develops when fly larvae feed on bird carcasses containing the toxin. Waterfowl that consume toxin-laden maggots develop botulism (USGS, 2016). Avian botulism has the potential to occur on the Project area during operation of the Kettleman Reservoir.

Wildlife Movement Corridors

Wildlife movement corridors, or habitat linkages, are generally defined as connections between habitat patches that allow for physical and genetic exchange between otherwise isolated animal populations. Such linkages may serve a local purpose, such as providing a linkage between foraging and denning areas, or they may be regional in nature. Some habitat linkages may serve as migration corridors, wherein animals periodically move away from an area and then subsequently return. Others may be important as dispersal corridors for young animals. A group of habitat linkages in an area can form a wildlife corridor network.

Habitats within a linkage are not necessarily the same as those being linked. Rather, the linkage needs only contain sufficient cover and forage to allow temporary inhabitation by ground-dwelling species during periods of movement among areas of suitable habitat. Typically, habitat linkages are contiguous strips of natural areas, though dense plantings of landscape vegetation can be used by certain disturbance-tolerant species. Depending on the species, a linkage may require specific minimum physical characteristics (such as rock outcroppings, vernal pools, specific vegetation cover, etc.) to function as an effective wildlife corridor, and allow those species to traverse the linkage. For highly mobile or aerial species, habitat linkages may be discontinuous patches of suitable resources spaced sufficiently close together to permit travel along a route in a relatively short period of time.

Corridors usually connect one large habitat area with another, and while there is no pre-defined size limit for such areas, they most often are on the scale of mountain ranges, valleys, rivers and creeks, or clearly delimited ecological situations (e.g., vernal pools). The Missing Linkages: Restoring Connectivity to California Landscape (Penrod, 2001) report documenting proceedings of the 2000 conference on this topic refers to such corridors as “landscape linkages.” These are specifically defined in that report as:

> *…large, regional connections between habitat blocks (“core areas”) meant to facilitate animal movement and other essential flows between different sections of a landscape (taken from Soulé and Terborgh 1999). These linkages are not necessarily constricted, but are essential to maintain connectivity function in the ecoregion.*

The Project would impact the hydrologic regime of the San Joaquin River through diversion of floodwater approximately every three out of ten years. Under existing conditions during flood events, flood water is

typically conveyed within the lower Kings River to the James Bypass and Fresno Slough where it is then discharged into the San Joaquin River. Depending on the size of the flood event, implementation of the Project would divert a portion of the floodwater that historically flowed out of the Kings River service area and ended up in the San Joaquin River via the James Bypass. The potential change in longfin smelt (*Spirinchus thaleichthys*) and juvenile Chinook salmon (*Oncorhynchus tshawytscha*) survival as a function of reducing river flow in response to the estimated reduction in James Bypass discharge into the San Joaquin River was analyzed in the Project's *Fishery Resources Analysis* (Appendix J). Results of the study indicated that a reduction in river outflow through the Sacramento-San Joaquin River Delta is expected to only contribute to an insignificant incremental reduction in longfin smelt and Chinook salmon abundance during those years when flood water is diverted to the Project. In addition, the escapement of adult Chinook salmon into their spawning grounds on the San Joaquin River during years when water would be diverted to the project was considered an insignificant incremental reduction in escapement.

Other than occasional floodwater flow from the Kings River to the San Joaquin River, the Project area is not located within any other landscape linkages identified by the above reference. Regionally, the Project area is not located within an Essential Connectivity Area (ECA) as mapped in the report, California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California (Spencer et al., 2010). ECAs represent principle connections between Natural Landscape Blocks. ECAs are regions in which land conservation and management actions should be prioritized to maintain and enhance ecological connectivity. ECAs are mapped based on coarse ecological condition indicators, rather than the needs of particular species and thus serve the majority of species in each region.

3.5.2 Regulatory Setting

Federal Policies and Regulations

United States Fish and Wildlife Service

The USFWS implements the Migratory Bird Treaty Act (16 United States Code [USC] Section 703-711) and the Bald and Golden Eagle Protection Act (16 USC Section 668). The USFWS and NMFS share responsibility for implementing FESA (16 USC Section 153 *et seq.)*. The USFWS generally implements FESA for terrestrial and freshwater species, while the NMFS implements FESA for marine and anadromous species. Projects that would result in "take" of any federally listed threatened or endangered species are required to obtain permits from the USFWS or NMFS through either Section 7 (interagency consultation with a federal nexus) or Section 10 (Habitat Conservation Plan) of FESA, depending on the involvement by the federal government in permitting and/or funding of the project. The permitting process is used to determine if a project would jeopardize the continued existence of a listed species and what measures would be required to avoid jeopardizing the species. "Take" under federal definition means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Proposed or candidate species are not subject to FESA's take prohibitions; however, the USFWS and the NMFS advise project applicants that they could be elevated to listed status at any time.

United States Army Corps of Engineers

Under Section 404 of the Clean Water Act, USACE has authority to regulate activities that result in discharge of dredged or fill material into wetlands or other "waters of the United States." Perennial and intermittent creeks are considered waters of the United States if they are hydrologically connected to other jurisdictional waters. The USACE also implements the federal policy embodied in Executive Order 11990, which is intended to result in no net loss of wetlands. In achieving the goals of the Clean Water Act, the USACE seeks to avoid adverse impacts and offset unavoidable adverse impacts on existing aquatic resources. Any discharge into wetlands or other "waters of the United States" that are hydrologically connected and/or demonstrate a significant nexus to jurisdictional waters would require a permit from the

USACE prior to the start of work. Typically, when a project involves impacts to waters of the United States, the goal of no net loss of wetlands is met through compensatory mitigation involving creation or enhancement of similar habitats.

State Policies and Regulations

California Department of Fish and Wildlife (CDFW)

The CDFW derives its authority from the Fish and Game Code of California. The CESA (Fish and Game Code Section 2050 *et. seq.)* prohibits take of state-listed threatened and endangered species. Take under CESA is restricted to direct mortality of a listed species and does not prohibit indirect harm by way of habitat modification. Projects that would result in "take" of any state-listed threatened or endangered species are required to obtain an incidental take permit (ITP) pursuant to Fish and Game Code Section 2081. The issuance of an ITP is dependent upon the following: 1) the authorized take is incidental to an otherwise lawful activity; 2) the impacts of the authorized take are minimized and fully mitigated; 3) the measures required to minimize and fully mitigate the impacts of the authorized take are roughly proportional in extent to the impact of the taking on the species, maintain the applicant's objectives to the greatest extent possible, and are capable of successful implementation; 4) adequate funding is provided to implement the required minimization and mitigation measures and to monitor compliance with and the effectiveness of the measures; and 5) issuance of the permit would not jeopardize the continued existence of a State-listed species.

CDFW also prohibit take for species designated as fully protected under Fish and Game Code Sections 3511, 4700, 5050 and 5515.

California Fish and Game Code Sections 3503, 3503.5, and 3511 describe unlawful take, possession, or destruction of birds, nests, and eggs. Fully protected birds (Section 3511) may not be taken or possessed except under specific permit. Section 3503.5 of the Code protects all birds-of-prey and their eggs and nests against take, possession, or destruction of nests or eggs. SSC is a category used by CDFW for those species which are considered to be indicators of regional habitat changes or are considered to be potential future protected species. SSCs do not have any special legal status except that which may be afforded by the Fish and Game Code as noted above. The SSC category is intended by CDFW for use as a management tool to provide these species special consideration when decisions are made concerning the development of natural lands. The CDFW also has authority to administer the Native Plant Protection Act (NPPA) (Fish and Game Code Section 1900 *et seq.*). The NPPA requires CDFW to establish criteria for determining if a species, subspecies, or variety of native plant is endangered or rare. Under Section 1913(c) of the NPPA, the owner of land where a rare or endangered native plant is growing is required to notify the CDFW at least 10 days in advance of changing the land use to allow for salvage of the plant(s).

Prior to substantially diverting or obstructing the natural flow or substantially changing, the bed, channel, or bank, of any perennial and intermittent streams, notification must be provided to CDFW in accordance with Section 1600 *et seq.* of the Fish and Game Code (Lake and Streambed Alteration Agreements).

Regional Water Quality Control Board

The State Water Resources Control Board (SWRCB) and each of nine local Regional Water Quality Control Boards have jurisdiction over "waters of the State" pursuant to the Porter-Cologne Water Quality Control Act and are defined as any surface water or groundwater, including saline waters, within the boundaries of the State. The SWRCB has issued general Waste Discharge Requirements (WDRs) regarding discharges to "isolated" waters of the State (Water Quality Order No. 2004-0004-DWQ, *Statewide General Waste Discharge Requirements for Dredged or Fill Discharges to Waters Deemed by the U.S. Army Corps of Engineers to be Outside of Federal Jurisdiction*). The local Regional Water Quality Control Boards enforce actions under this general order for isolated waters not subject to federal jurisdiction, and are also

responsible for the issuance of water quality certifications pursuant to Section 401 of the Clean Water Act for waters subject to federal jurisdiction. The Tulare Lake Storage and Floodwater Protection Project is within the jurisdiction of the Central Valley Regional Water Quality Control Board (RWQCB).

Central Valley Flood Protection Board

The Central Valley Flood Protection Board (CVFPB) oversees activities that would potentially affect the flood control system in the San Joaquin Valley (also called the Central Valley). A CVFPB Permit is required for such projects, including the placement, construction, reconstruction, removal, or abandonment of:

- any landscaping, culvert, bridge, conduit, fence, projection, fill, embankment, building, structure, obstruction, encroachment or works of any kind,
- the planting, excavation, or removal of vegetation, and any repair or maintenance that involves cutting into the levee, wholly or in part, within any area for which there is an Adopted Plan of Flood Control as defined by California Code of Regulations (CCR) Title 23, Division 1

Permits may be required by the CVFPB for existing structures that predate permitting or where it is necessary to establish the conditions normally imposed by permitting. The circumstances include those where responsibility for the encroachment has not been clearly established or ownership and/or the uses have changed.

In general, if the proposed work is located within the State Plan of Flood Control, within 300 feet of a Designated Floodway that has been adopted by the CVFPB, or within 30 feet from the banks of a CVFPB Regulated Stream per CCR, Title 23, Section 112, Table 8.1, a permit would be required. Kings River at Empire Weir No. 2 at the north end of the Study Area is shown on the Best Available Maps of CVFPB Jurisdiction (CVFPB, 2017); therefore, a permit from CVFPB may be required.

CVFPB requires that each permit application is in compliance with CEQA in accordance with CCR, Title 23, Section 191, incorporation of California Environmental Quality Act Guidelines. In addition to a CEQA review, permit applications are also provided to the USACE to ensure compliance with the National Environmental Policy Act.

Local Policies and Regulations

2035 Kings County General Plan

The *2035 Kings County General Plan* (2010) is the County's overarching planning document that provides a blueprint of how the County intends to protect its resources, identifies where future growth may occur, and describes how projects can be developed. Implementation of the General Plan is carried out consistent with the *Kings County Development Code* (Kings County, 2016), which describes specifically what types of land uses are allowed in the county. The County's Zone Maps show where each land use may be located.

The General Plan's Resource Conservation (RC) Element contains the following policies that support RC Goal D1 which requires preservation of land that contains important natural plant and animal habitats and RC Goal E1 that balances the protection of the County's diverse plant and animal communities with the County's economic needs. Note that the General Plan references California Department of Fish and Game as the plan was last updated prior to that agency's name change to California Department of Fish and Wildlife in 2012. References to "California Department of Fish and Game", "California Department of Fish and Wildlife", "CDFG", and "CDFW" in this report all refer to CDFW.

Natural Plant and Animal Habitats

RC Policy D1.1.1:

Evaluate all discretionary land use applications in accordance with the screening procedures contained in the Biological Resources Survey located in Appendix B of the Kings County General Plan. If the results of the project screening indicate the potential for important biological resources to exist on the site, a biological evaluation (consistent with Appendix B) shall be performed by a qualified biologist. If the evaluation indicates that the project could have a significant adverse impact, mitigation shall be required or the project will be redesigned to avoid such impacts. Mitigation shall be provided consistent with CEQA and applicable state and federal guidelines, as appropriate. Mitigation may include habitat improvement or protection, acquisition of other habitat, or payment to an appropriate agency to purchase, improve, or protect such habitat.

RC Policy D1.1.2:

Require project applicants to consult with the California Department of Fish and Game and the United States Fish and Wildlife Service and to obtain appropriate authority for such take pursuant to Endangered Species Act requirements if new development or other actions are likely to result in incidental take of any threatened or endangered species.

RC Policy D2.1.1:

Follow state and federal guidelines for the protection of natural wetlands. Require developers to obtain authorization from the appropriate local, state, or federal agency prior to commencement of any wetland fill activities.

RC Policy D2.1.2:

Use the CEQA process to assess wetland resources, and require mitigation measures for development which could adversely impact a designated wetland.

RC Policy D2.1.3:

Exempt prior converted wetlands from consideration as wetlands under the County planning process, except as required by state and federal regulations.

RC Policy D3.1.6:

Evaluate California Department of Fish and Game-approved conservation plans and wildlife corridor studies prepared by government or private non-profit biological resource entities that analyze Kings County's wildlife and riparian habitat, and where feasible, accommodate implementation of wildlife corridor plans.

Threatened and Endangered Species:

RC Policy E1.1.1:

Complete the inquiry process outlined in Appendix B in the initial project review for development permits to determine whether the project is likely to have a significant adverse impact on any threatened or endangered species habitat locations, and to assure appropriate consideration of habitat preservation by development. Maintain current copies of California Department of Fish and Game and United States Fish and Wildlife Service maps showing locations of known threatened and endangered species habitat. If shown to be necessary, require the developer to consult with the California Department of Fish and Game, the United States Fish and Wildlife Service, and the United States Army Corps of Engineers as to potential impacts, appropriate mitigation measures, and required permits.

RC Policy E1.1.2:

Require, as a primary objective in the review of development projects, the preservation of healthy native oaks and other healthy native trees.

RC Policy E1.1.3:

Maintain, to the maximum extent practicable, the natural plant communities utilized as habitat by threatened and endangered species (see Appendix B for a listing and map of these plant communities).

3.5.3 Impact Analysis

Methodology for Analysis

The impact analysis considers the potential for the proposed Project to impact biological resources occurring within the proposed leveed impoundment on approximately 16,700 gross acres within the dry lakebed (Project area). Of the approximately 16,700 gross acres, approximately 12,000 acres would be developed into a single surface reservoir (Kettleman Reservoir) with multiple interior storage cells using levees six to eight feet in height, resulting in a total storage capacity of approximately 15,000 to 30,000 acre-feet[2].

Data used for this analysis included site surveys, aerial photographs, topographic maps, resource databases, accepted scientific texts to identify species and habitats, and technical studies completed for the Project area and available in Appendices B and C, as previously described in the introduction to this section.

Thresholds of Significance - Evaluation Criteria

For the purposes of this analysis, impacts to biological resources would be significant if the proposed Project would result in any of the following:

- A substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.
- A 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.
- A substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to actions associated with the proposed Project are identified below along with a supporting rationale as to why further consideration is unnecessary and a no impact determination is appropriate.

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

[2] An acre-foot equals 325,851 gallons.

proposed Project is located within the boundaries of the *PG&E San Joaquin Valley Operations & Maintenance Habitat Conservation Plan* (HCP); however, the applicant is not bound to the requirements of this HCP as they are not a permittee. The Project is not located within the boundaries of any other adopted HCP, adopted Natural Community Conservation Plan or other approved conservation agreement within the County (Threshold 6). Therefore, this issue is not discussed further in this section.

Impacts and Mitigation Measures

Impact BIO-1 Implementation of the proposed Project could have a substantial adverse effect, either directly or through habitat modifications, on 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.

This section provides a summary of the Project's overall mitigation strategy. In addition to the overall strategy, species-specific mitigation requirements are explained in detail in the Project's proposed mitigation measures.

Because biological impacts associated with the Project are determined by potential impacts related to the conversion of suitable habitat, not impacts related to the direct construction of facilities, this discussion separates potential impacts on biological resources from the Project by indirect and direct impacts on special status species and their suitable habitat during the construction phase and operations and maintenance phase, rather than by facility type.

As documented in Section 3.5.1, the Project area contains low quality habitat for most special status species due to historic and existing agricultural operations. Because protocol-level surveys have not been completed for all of the special status species potentially occurring on the Project area, some level of impacts to special status species is assumed. Project design features that would avoid or reduce the level of impacts during Project construction and operation include using existing canals where possible for conveyance. The locations of these canals, along large portions of the Project area periphery, limits access for terrestrial wildlife to colonize the site in addition to reducing impacts to habitat.

Depending on the special status species as described below, either protocol-level surveys will be conducted to determine the presence or absence of a particular species, with Project mitigations or design modifications implemented to reduce impacts depending on the results of the survey, or the presence of a particular species will be assumed. If protocol-level survey results for a particular species are negative and the species is confirmed absent from the Project area, no compensatory mitigation will be provided for that species. If protocol-level surveys are not conducted for a particular species and the species is assumed present, or if protocol-level surveys confirm the presence of a particular species and the Project's avoidance and minimization measures outlined in the Project description and mitigation measures cannot reduce the impact to less than significant, compensatory mitigation would be provided as described in Mitigation Measure BIO-1 for that species. Compensatory mitigation for impacts to federal and/or state listed wildlife species habitat, for those species that are confirmed present on the Project area, shall be provided at a ratio of not less than 1:1 (area mitigated to area impacted) for high to moderate quality suitable habitat and 1:1 (area mitigated to area impacted) for low quality or marginally suitable habitat that would otherwise only be utilized for foraging and/or dispersal. Compensatory mitigation would either be in the form of purchasing mitigation bank credits from a CDFW- and/or USFWS-approved mitigation/conservation bank, and/or Semitropic would utilize suitable lands from their real estate portfolio or purchase property(ies) to accommodate the conservation easement, prepare a long-term management plan, and establish a conservation easement that would be managed for the impacted species in perpetuity. When suitable habitat for multiple species exists on a mitigation bank site or conservation easement (e.g., California annual

grassland habitat supporting San Joaquin kit fox and Swainson's hawk), the compensatory mitigation would collectively provide the compensatory mitigation for each of those impacted species.

Protocol-level surveys would be conducted during the appropriate season and in accordance with accepted methods prior to the issuance of a final building permit, and preconstruction surveys would be conducted during the appropriate time frame as described in the following mitigation measures prior to initial ground disturbing activities associated with Project construction.

Due to the nature of the Project (flooding the Kettleman Reservoir) and the fact that Semitropic would receive short notice from applicable water agencies that water is available for use by the Project, special status species surveys prior to inundation of the Kettleman Reservoir during the operational phase of the Project would not be conducted because the limited prior notice and large size of the site make such surveys infeasible. Thus, some level of operations phase impacts are assumed, and habitat for terrestrial species within the reservoir area is considered permanently lost. Mitigation ratios shall be based on this assumption for those species for which some low level of occupancy is assumed. An Incidental Take Permit (ITP), which would be issued by CDFW (CESA/California Fish and Game Code Sections 2081(b) and 2081(c)) and a Biological Opinion (FESA Section 7), may be required to appropriately mitigate impact on special status species. In addition, and if required, an ITP would be obtained from the USFWS covering the listed species having the potential to occupy the Project area and thereby be affected by the Project, and the associated avoidance and minimization measures and compensatory mitigation required by those permits would be implemented.

Special Status Plant Species

No special status plants were documented during biological resources surveys completed in 2016, although a protocol-level botanical survey was not completed. The majority of the Project footprint consists of managed agricultural lands that are regularly plowed and are not suitable for special status plants. These areas are managed for crop production, and other vegetation is regularly managed through herbicide use and mechanical removal. Irrigation canals and distribution ditches are regularly maintained, with vegetation periodically cleared from these features to maintain channel capacity. Due to the regular disturbance of these features, it is unlikely that special status plants would occur in these features, and the majority of the proposed Project is unlikely to affect special status plants.

However, some annual grassland and saltbush scrub are present near the southwest corner of the Project area where the proposed intertie would connect to the California Aqueduct. These vegetation communities support a large number of non-native plants but do have some potential to support special status plants known to occur close to the Study Area. A reported occurrence of San Joaquin woollythreads east of the California Aqueduct overlaps the Project area near the proposed intertie. The CNDDB indicates that all portions of this occurrence may have been extirpated through conversion to cropland, and documents that the species was not seen in 2013, although the survey was done in a drought year and is inconclusive. Some potentially suitable habitat remains in the vicinity of the proposed intertie along the east side of the California Aqueduct, and if San Joaquin woollythreads are present, the intertie portion of the Project could result in loss of individuals.

Additionally, some fields have been fallow for a number of years, and have been colonized by non-native annual grasses and herbs. These fields are currently used for pasture. Fields that have been fallow for more than four years that are within one mile of natural habitats have some potential to have recruited special status plants known to occur regionally for which wind dispersal of seed is suspected, including San Joaquin woollythreads. It is not expected that rare plants would have recruited further than this distance into fallow fields in a five-year window due to limitations on seed dispersal. The acreage of long-fallow fields is expected to vary annually with crop production cycles and irrigation water availability.

Finally, although many portions of the banks of the Kings River at Empire Weir No. 2 and South Fork Canal banks are managed with little or no vegetation, some native vegetation remains. Where native vegetation persists, there is some potential for special status plants to occur.

The CDFW standards state that species with a CRPR of 1A, 1B, 2A, and 2B may meet definitions of rare or endangered under CEQA Sections 15380 (b) and (d) (CDFW, 2017c). By the CNPS standards, the plants with CRPR of 1A, 1B, 2A and 2B meet the definitions of Sections 2062 and 2067 (CESA) of the California Fish and Game Code, and are eligible for state listing (CNPS, 2017b).

Impacts to any individuals of federally- and/or state-listed plant species would be significant without compensatory mitigation. Mitigation is required for all impacts to listed plants within the Project area. Additionally, CRPR 1B plant species meet CEQA Section 15380 criteria as rare, and impacts would be potentially significant without compensatory mitigation sufficient to prevent impacts that could cause the regional population of any of these species to drop below self-sustaining levels, threaten to eliminate any plant community of which the species was a key part, or substantially reduce the number of occurrences or individuals or restrict the range of that species.

Direct Impacts to Special Status Plant Species

Construction

All Facilities

If special status plants are present, project activities in grassland habitat and immediately adjacent long-term fallowed fields, such as grading, excavation, construction of interties for new canals, and construction of levees, could directly and adversely affect these plants through destruction of individuals and occupied habitat. Other types of ground disturbance, such as construction access, staging, trampling, or soil compaction by equipment and vehicles, could also result in destruction of individuals, but these types of impacts would not be expected to result in permanent loss of occupied habitat.

Most ground-disturbing impacts resulting from implementation of the Project would be considered permanent impacts on special status plants because of their specialized microhabitat conditions. However, temporary construction access activities that (1) do not involve grading (e.g., personnel or equipment access leading to vegetation trampling, or temporary non-hazardous materials laydown), (2) occur in known, occupied, special status plant habitat but (3) outside the growth or blooming period for that species, such that there is (4) no expected change in drainage patterns, aspect, or soil compaction requiring restoration actions, and no movement or loss of existing topsoil, are not expected to permanently affect the special status plant populations present on the site or lead to the decline or extirpation of these populations. Therefore, such access-related impacts may be considered temporary. However, because bloom and fruit-set for all special status plant species identified on-site is collectively expected to span several months, avoiding these life stages for all special status plant species is likely not feasible, and individuals and populations would be expected to be impacted by the Project, should they be present in the work area.

Operations and Maintenance

All Facilities

Any populations of special status plants that were present in the permanent Project footprint would be permanently removed by construction activities. During operations, habitat conditions in water storage areas would also be periodically altered in years when sufficient floodwater is available for capture and storage. In years during which large amounts of water are available, soils would be inundated or saturated for long periods of time and would not be suitable for upland special status plants in those years. In other

years, it is expected that annual grasses will recruit and these areas would be used as pasture. Note that the seed bank is already present for recruitment of annual grasses. Past patterns suggest three out of 10 years result in sufficient surplus water to convey water southward, and depending on capacity, in some years the storage area would be used to hold water until capacity is available in the California Aqueduct and/or at Semitropic. Due to the anticipated frequency of flooding (three out of every 10 years on average), it is not expected that special status plants would recruit into the storage facility. If any special status plants are found outside the permanent footprint but within access areas or temporary impact locations, such as in areas adjacent to the Aqueduct Intertie, future maintenance activities could result in impacts through disturbance of habitat and loss of individuals.

Indirect Impacts to Special Status Plant Species

Construction, Operations, and Maintenance

All Facilities

Indirect impacts to special status plant species could include the further spread of non-native weedy species and shifts in microhabitat conditions on-site over time. Non-native invasive plant species are ubiquitous in the region, and were observed along margins of fields, margins of roads, and in fallow fields. Most species were associated with the grassland habitat and ruderal areas, and included species that are ranked by the California Invasive Plant Council (Cal-IPC, 2017) as having a moderate to high ecological impact on native habitats, such as Russian thistle, red brome, and bindweed. Tamarisk is also prevalent along irrigation ditches and basins that have not been maintained recently. Despite the persistence of these species across the Project area, ground disturbance activities could result in greater spread and density of many of these species. Dust from construction could also affect offsite populations of special status plants by coating leaves and reducing efficiency of photosynthesis.

Special Status Animal Species

As mentioned above and presented in Table 3.5-4, there are 19 special status wildlife species known to occur or with potential to occur within the Study Area and thereby have potential to be affected during Project implementation. Ten of these species are given high levels of protection by the federal government through listing under FESA and/or by the state government through listing under CESA or designation as fully protected. The remaining species are SSC that are afforded consideration and protections through CEQA and/or through local ordinances. An analysis of the potential impacts of the proposed Project to special status wildlife species with potential to occur or which are known to occur is presented below.

San Joaquin Kit Fox

As discussed above, the Project area contains suitable habitat for San Joaquin kit fox, and the species is known to occur in the region. As such, the proposed Project has the potential to impact this species. Below is a discussion of the potential direct and indirect impacts to this species from implementation of the proposed Project. For the purpose of this analysis, San Joaquin kit fox habitat consists of those habitats discussed in Section 3.5.1.7.

Direct Impacts to the San Joaquin Kit Fox

Construction

All Facilities

Direct impacts to San Joaquin kit fox include mortality, den destruction, injury, displacement, and harassment, along with permanent and temporary conversion of suitable habitat. During construction, destruction of San Joaquin kit fox dens, if present, could occur during clearing and grubbing, grading, trenching or other earthwork-like activities. Dens could also be collapsed by Project vehicles or equipment

driving over them. In addition, injury or mortality could occur as a result of collisions with vehicles or construction equipment, entrapment in trenches and excavations, or exposure to spilled or leaked industrial chemicals, fuels, and lubricants.

Activities associated with the construction of the proposed facilities listed in Section 2.4 would result in a loss or permanent modification of San Joaquin kit fox habitat. Permanent above-ground facilities discussed in Section 2.4, such the new electrical substation, pumping plants and maintenance yard, would incur a permanent conversion of habitat resulting in a loss of approximately 3,180 acres. Construction of the proposed reservoir and conveyance channels in and of themselves would temporarily impact and modify existing habitat; however, operation of these facilities when water is diverted would result in a loss of habitat for the period of inundation only. The maximum potential loss from inundation is presented and discussed below in the *Operation and Maintenance* section.

Operations and Maintenance

All Facilities

Direct impacts to the San Joaquin kit fox from maintenance activities would be similar to those of construction and would include mortality, den destruction, injury, displacement, and harassment, along with temporary disturbances to suitable habitat. These impacts could occur through clearing and grubbing, grading, trenching or other earthwork-like maintenance activities. Dens could also be collapsed by Project vehicles or equipment driving over them, if present. In addition, injury or mortality could occur as a result of collisions with vehicles or construction equipment, entrapment in trenches and excavations, or exposure to spilled or leaked industrial chemicals, herbicides, fuels, and lubricants. If rodenticides are used as part of the proposed Project's rodent control program, mortality could occur if San Joaquin kit foxes ingest small mammals that contain these poisons.

Operation of the proposed Project through inundation would displace any San Joaquin kit foxes within the inundated areas. San Joaquin kit foxes could be killed as a direct result of inundation. In addition, if inundation were to begin during the pupping season and an active natal den were present, flooding has the potential to cause pup mortality.

Operation of the proposed Project would result in permanent impacts to up to 13,129.85 acres of San Joaquin kit fox habitat providing potential foraging, dispersal and denning habitat. Flooding of the Project area, specifically the proposed reservoir and new conveyance systems, would eliminate denning and foraging habitat while the area is flooded and would prevent movement and foraging across the site. Although significant changes to the grassland vegetation would occur within the Project area during flooding, San Joaquin kit fox may continue to use the site for denning, foraging, and dispersal when these areas do not contain water. When areas are flooded for an extended period of time, they would be degraded as habitat for San Joaquin kit fox due to changes in vegetation structure and composition as well as loss of prey base. The degraded condition would remain unless there was sufficient time between inundations in which successional processes, as well as recolonization of prey species, could occur.

Indirect Impacts to the San Joaquin Kit Fox

Construction

All Facilities

Indirect impacts to San Joaquin kit fox from construction activities could occur through changes in behavior due to increased human activity and noise that could be detrimental to individuals if the behavioral changes are to such an extent that they would not be able to effectively forage or avoid predation thereby affecting survival and reproductive success. In addition, increased human activity could attract predators, such as coyotes, through leaving of trash (especially food trash) or unearthing prey species during earthwork.

Operations and Maintenance

All Facilities

Indirect impacts to the San Joaquin kit fox from maintenance activities would be similar to those discussed above and would include potentially detrimental changes in behavior that could be due to increased human activity and noise as well as increasing the prevalence of predators.

Because of the large size and scale of the proposed Project, operation through inundation has potential to displace San Joaquin kit foxes within the proposed areas of inundation. This displacement can potentially have indirect consequences to the dynamics of the local population. Displaced individuals would be forced to move to other areas within the population potentially causing disruption or overlapping of territorial boundaries, which decreases fitness and reproduction as a result of increasing competition. However, because of the small number of individuals and the small local population that would be affected relative to the entire range-wide population and available habitat, this indirect impact would be less that significant and would not contribute to further decline of the species to extinction or extirpation.

Blunt-nosed Leopard Lizard

As discussed above, the Project area contains suitable habitat for the blunt-nosed leopard lizard in the western portion of the Project area near the proposed aqueduct intertie and pumping station, and the species is known to occur in the region and in close proximity to the Project area. As such, the proposed Project has the potential to impact this species. Below is a discussion of the potential direct and indirect impacts to this species from implementation of the proposed Project. For the purpose of this analysis, blunt-nosed leopard lizard habitat consists of those habitats discussed in Section 3.5.1.7.

Direct Impacts to the Blunt-nosed Leopard Lizard

Construction

All Facilities

If present, direct impacts to the blunt-nosed leopard lizard include mortality, injury, displacement, and harassment, along with permanent and temporary conversion of suitable habitat. During construction, injury and mortality could occur during clearing and grubbing, grading, trenching or other earthwork-like activities. In addition, injury or mortality could occur as a result of collisions with vehicles or construction equipment, entrapment in trenches and excavations, or exposure to spilled or leaked industrial chemicals, fuels, and lubricants.

Activities associated with the construction of the new proposed facilities listed in Section 2.4 would result in a loss or permanent modification of blunt-nosed leopard lizard habitat. Permanent above-ground facilities discussed in Section 2.4, such as the Aqueduct Intertie turn-in/turn-out structure, would incur a permanent conversion of valley saltbush scrub habitat resulting in a loss of approximately 0.97 acre. Construction of the Aqueduct Intertie facilities would also result in temporary impacts to suitable habitat consisting of 4.82 acres of ruderal habitat within a PG&E easement, and 57.33 acres of nonnative grassland habitat west of the Blakeley Canal.

Operations and Maintenance

All Facilities

Direct impacts to the blunt-nosed leopard lizard from maintenance activities would be similar to those of construction and would include mortality, injury, displacement, and harassment, along with temporary disturbances to suitable habitat. These impacts could occur through clearing and grubbing, grading, mowing, trenching or other earthwork-like activities. In addition, injury or mortality could occur as a result

of drowning when the cell is filled with water, collisions with vehicles or construction equipment, entrapment in trenches and excavations, or exposure to spilled or leaked industrial chemicals, herbicides, fuels, and lubricants.

As proposed, the Project would not result in temporary or permanent impacts of blunt-nosed leopard lizard habitat during ground-disturbing operations activities beyond the acreage's described in the Construction Section above.

Indirect Impacts to the Blunt-nosed Leopard Lizard

Construction

All Facilities

Indirect impacts to blunt-nosed leopard lizard from construction activities could occur through changes in behavior due to increased human activity and noise that could be detrimental to individuals if the behavioral changes are to such an extent that they would not be able to effectively forage or avoid predation thereby affecting survival and reproductive success. In addition, increased human activity could attract predators, such as ravens, through leaving of trash (especially food trash).

Operations and Maintenance

All Facilities

Indirect impacts to the blunt-nosed leopard lizard from maintenance activities would be similar to those discussed above and would include potentially detrimental changes in behavior that could be due to increased human activity and noise as well as increasing the prevalence of predators. In the first years following construction, temporarily disturbed areas may be susceptible to weeds. Early succession favors colonization by rapid growing and typically weedy species. As such, the potential for invasive species to occur at least initially is high. Presence of high densities of herbaceous vegetation lowers suitability and, in extreme cases, can preclude occupation by the blunt-nosed leopard lizard. However, based on the Project description, management activities such as mowing and grazing would be used to control weeds, which would reduce cover height and density. As previously noted, mowing could result in direct impacts to individuals.

Special Status Small Mammals

As discussed above, the Project area contains suitable habitat for the giant kangaroo rat, Tipton kangaroo rat, and Nelson's antelope squirrel. In addition, the CNDDB has a recorded occurrence of the Tipton kangaroo rat and a recorded occurrence of the Nelson's antelope squirrel overlapping the Project area. The Project area also contains suitable habitat for the Tulare grasshopper mouse. As such, the proposed Project has the potential to impact these species. Below is a discussion of the potential direct and indirect impact to these species from implementation of the proposed project. For the purpose of this analysis, giant kangaroo rat, Tipton kangaroo rat, Nelson's antelope squirrel, and Tulare grasshopper mouse habitats consist of those habitats discussed in Section 3.5.1.

Direct Impacts to Special Status Small Mammals

Construction

All Facilities

As discussed above, the Project area contains suitable habitat for special status small mammals. Specifically, the CNDDB has a recorded occurrence of the Tipton kangaroo rat overlapping the Project area. As such, the proposed Project has the potential to impact special status small mammals. Below is a discussion of the potential direct and indirect impact to these species from implementation of the proposed

project. For the purpose of this analysis, giant kangaroo rat habitat consists of those habitats discussed in Section 3.5.1.7.

Direct impacts to the giant kangaroo rat and Tipton kangaroo rat include mortality, injury, displacement (through destruction of precincts), and direct impacts to the Nelson's antelope squirrel include mortality, injury, displacement (through destruction of burrows). If present, direct impacts to the Tulare grasshopper mouse include mortality, injury, and displacement (through loss of cover). If present, direct impacts to these could also include harassment as well as well as permanent and temporary conversion of suitable habitat. During construction, injury and mortality could occur during clearing and grubbing, grading, trenching or other earthwork-like activities. In addition, injury or mortality could occur as a result of collisions with vehicles or construction equipment, entrapment in trenches and excavations, or exposure to spilled or leaked industrial chemicals, fuels, and lubricants.

Activities associated with the construction of the new proposed facilities listed in Section 2.4 would result in a loss or permanent modification of giant kangaroo rat, Tipton kangaroo rat, Nelson's antelope squirrel, and Tulare grasshopper mouse habitat. Permanent above-ground facilities discussed in Section 2.4, such as the new electrical substation, pumping plants and maintenance yard, would incur a permanent conversion of habitat resulting in a loss of approximately 3,180 acres of potential giant kangaroo rat, Tipton kangaroo rat, Nelson's antelope squirrel, and Tulare grasshopper mouse habitat. Construction of the proposed reservoir and conveyance channels in and of themselves would temporarily impact and modify existing habitat; however, operation of these facilities when water is diverted would result in a loss of habitat for the period of inundation. The maximum potential loss from inundation is presented and discussed below in the *Operation and Maintenance* section.

Operations and Maintenance

All Facilities

Direct impacts to the giant kangaroo rat, Tipton kangaroo rat, Nelson's antelope squirrel, and Tulare grasshopper mouse from maintenance activities would be similar to those of construction and would include mortality, injury, displacement, and harassment, along with temporary disturbances to suitable habitat. These impacts could occur through clearing and grubbing, grading, mowing, trenching or other earthwork-like activities. In addition, injury or mortality could occur as a result of collisions with vehicles or construction equipment, entrapment in trenches and excavations, or exposure to spilled or leaked industrial chemicals, herbicides, fuels, and lubricants.

Operation of the proposed Project through inundation could cause giant kangaroo rat, Tipton kangaroo rat, Nelson's antelope squirrel, and Tulare grasshopper mouse mortality, if individuals are present within the area of inundation, through flooding of occupied burrows, or of individuals on the surface that cannot escape rising water levels.

Operation of the proposed Project would result in permanent impacts up to 13,130.32 acres of giant kangaroo rat, Tipton kangaroo rat, Nelson's antelope squirrel, and Tulare grasshopper mouse habitat. Flooding of the Project area, specifically the proposed reservoir and new conveyance systems, would remove habitat for this species while the area is flooded. Although significant changes to kangaroo rat habitat, Nelson's antelope squirrel habitat, and Tulare grasshopper mouse habitat would occur within the Project area during flooding, the giant kangaroo rat, Tipton kangaroo rat, Nelson's antelope squirrel, and Tulare grasshopper mouse habitat may reoccupy these areas when these areas do not contain water if sufficient food supply is present. When areas are flooded for extended periods of time, they would be degraded as habitat containing grass seeds which are an essential food source would initially be absent. The degradation would remain unless there was sufficient time between inundations in which successional processes can take effect to create an adequate food supply.

Habitat changes due to inter-annual variations in precipitation have been shown to result in wide population fluctuations to the giant kangaroo rat. The Endangered Species Recovery Program has biannually tracked population trends of the species on the Carrizo Plain since 1987. Their studies have shown that extended drought followed by heavy rainfall resulting in flooding during the spring of 1991 caused the highest population decline when the census observed less than one individual per acre (USFWS, 2010a). The following year, populations had increased to 49 to 57 per acre (USFWS, 2010a). Similarly, following an unusually wet year in 1998, populations of giant kangaroo rat significantly declined on ungrazed land but remained high on grazed land (USFWS, 2010a). Populations on the ungrazed land took three years to recover to the pre-wet year level. The data indicates that the species can recover quickly following flood events on grazed land.

Indirect Impacts to Special Status Small Mammals

Construction

All Facilities

Indirect impacts to the giant kangaroo rat, Tipton kangaroo rat, Nelson's antelope squirrel, and Tulare grasshopper mouse from construction activities could occur through changes in behavior due to increased human activity and noise that could be detrimental to individuals if the behavioral changes are to such an extent that the animals would not be able to effectively forage or avoid predation, thereby affecting survival and reproductive success. In addition, increased human activity could attract predators, such as ravens, through leaving of trash, especially food trash.

Operations and Maintenance

All Facilities

Indirect impacts to the giant kangaroo rat, Tipton kangaroo rat, Nelson's antelope squirrel and Tulare grasshopper mouse from maintenance activities would be similar to those discussed above and would include potentially detrimental changes in behavior that could be due to increased human activity and noise as well as increasing the prevalence of predators.

Raptors

Annual grasslands as well as active and fallow farmland in the Study Area provide suitable foraging habitat for Swainson's hawk, golden eagle, white-tailed kite, northern harrier, burrowing owl, and other raptors, including CDFW Watch Lists species such as ferruginous hawk. The majority of the Project area lacks suitably sized trees to serve as nesting habitat for Swainson's hawk or white-tailed kite; however, trees along the South Fork of the Kings River near Empire Weir No. 2 and on adjacent offsite ranch compounds provide some potential nesting habitat. In addition, Northern harriers and white tailed kites were observed foraging on the Project area during surveys. Although no harrier nests are known at the site, Northern harriers could nest on the ground in a dense clump of vegetation such as willows, grasses, sedges, reeds, bulrushes, or cattails. Golden eagles may forage up to 10 miles from their territory center in dry landscapes, and forage shorter distances in higher quality, undisturbed, habitat. No suitable nest habitats for golden eagle are present on or near the Project area.

Burrowing owls were documented at three locations during surveys and are expected to be present year-round, potentially including a mix of year-round residents, migrating transients, and winter residents. The Study Area contains suitable nesting and foraging habitat. Agricultural fields, fallow fields, and annual grasslands provide appropriate foraging habitat. Ground squirrel burrows on ditch and levee banks are appropriate nest sites. Since burrowing owls rely on subterranean burrows throughout the year for shelter and nesting, they are highly susceptible to ground disturbing activities.

Below is a discussion of the potential direct and indirect impacts to these species from implementation of the proposed Project.

Direct Impacts to Raptors

Construction

All Facilities

During construction of levees, approximately 12,000 acres of fallowed fields and basin areas would be disturbed. Grading to construct storage cells is expected to remove vegetation from the storage cells and would likely displace or kill small mammals that serve as potential prey for raptors. Construction of the conveyance canals and the pumping plant and Aqueduct Intertie would also remove some potential foraging habitat. This could potentially result in reduced reproductive output and success, increased competition between territories, or abandonment of territories or nests if available foraging habitat in the region proved limiting. Chemicals, fuels, or lubricants spilled on the ground could result in fouling or poisoning of raptors and their common prey species.

Additionally, ground disturbance to construct storage cells and excavate conveyance canals would likely collapse small mammal burrows, potentially entrapping burrowing owls. Among raptors, burrowing owls are particularly susceptible to ground disturbance. Direct impacts to burrowing owls include mortality, injury, destruction of burrows and loss of suitable foraging and nesting habitat. Direct impacts would also include disturbances to adjacent occupied burrows such that normal foraging, sheltering, or nesting behaviors are altered, potentially resulting in abandonment of nests. During construction, burrowing owls could be disturbed by Project activities to the point of abandoning their burrows, or possibly even abandoning eggs or young. Burrowing owls in burrows, as well as their eggs and young, could also be killed or injured if hit or crushed by construction equipment (e.g., graders, scrapers, bulldozers, and trucks), or entombed in burrows by soil compaction.

Vehicle collisions are a known risk for burrowing owls and represent the primary cause of burrowing owl death related to human actions (Poulin et al., 2012). Construction traffic is likely to affect burrowing owls. Impacts on burrowing owls could include injury or mortality if individuals are hit by moving vehicles. Vehicle strikes could also affect the other raptors, however, given the relatively low speeds at which construction equipment operate, and differences in their behaviors compared with burrowing owls, have a lower likelihood of occurring for the other species listed.

Other construction-related disturbances could result, including activities and noise associated with earth moving, grading, vegetation removal, and installation of Project infrastructure. Should a Swainson's hawk, white-tailed kite, or other raptor nest in the riparian corridor upstream of the Empire Weir No. 2, Project activities associated with weir improvements and canal deepening completed during the breeding season (typically February 1 through September 15) could result in nest abandonment or failure by disrupting the nest.

Construction-related disturbances may also alter foraging behavior of special status raptors. Direct impacts to Swainson's hawk, white tailed kite, golden eagle, northern harrier, burrowing owl, and other raptors could include mortality or injury of individuals, as well as disruption of foraging and nesting behaviors and loss of foraging and nesting habitat, leading to reduced productivity and nestling survival. These impacts would primarily occur during construction of the proposed Project.

Operations and Maintenance

All Facilities

During operations, the storage cells are expected to dry periodically and would likely recruit annual upland vegetation. Small mammals may recolonize the storage cells and are expected to persist in levee banks during periods in which the storage cells are flooded. Thus, during operations, the storage cells are anticipated to provide foraging habitat in at least some years.

Ground squirrels are expected to re-colonize the reservoir area, creating new potentially suitable burrows for burrowing owls. While burrows on levees could remain above water levels, during the next inundation cycle some owls could drown if water levels change dramatically, inundating occupied burrows. Mortality and injury due to vehicle strikes could occur throughout the operational phase of the Project, though given the relatively low speeds at which vehicles operate along levee roads, vehicle strikes have a lower likelihood of occurring than on paved roads.

Maintenance at the Empire Weir No. 2 could also generate noise and increased activity, and if a Swainson's hawk, white-tailed kite, or other raptor nests in the riparian corridor upstream, these activities could result in nest abandonment or failure by disrupting the nest.

Indirect Impacts to Raptors

Construction

All Facilities

Indirect impacts from construction activities could occur from noise and increased activities if a nest is present in close proximity to construction. Construction related noise can disrupt the behavior of nesting adults and therefore can indirectly lead to the failure of the nest. In addition, increased human activity could attract predators, such as coyotes and ravens, through leaving of trash (especially food trash). Predators such as coyotes and ravens can cause a nest to fail by preying upon eggs or young.

Operations and Maintenance

All Facilities

Indirect impacts from operations and maintenance would be similar to those discussed above and would include potentially detrimental changes in behavior leading to nest failure that could be due to increased human activity and noise, as well as increasing the prevalence of predators. Periodically lower availability of foraging habitat due to inundation cycles could also affect foraging success. Long-term declines in population viability and carrying capacity resulting from permanent foraging habitat loss and possible disturbance to Swainson's hawk, white tailed kite, and golden eagle would be considered significant. However, given the abundance of foraging habitat in the region, particularly west of the Project area, limited suitable nesting habitat on the Project area, and lack of known nests in the immediate vicinity, population-level impacts are considered unlikely.

Because burrowing owls are present throughout the Project area and potentially occur as both wintering and breeding residents, the loss of habitat and exposure to predation during displacement from established home range may result in indirect impacts that include a potential long-term decline in reproductive success and population viability.

Riparian, Marsh, and Shoreline Birds

As discussed above, the Project area contains suitable habitat for the tricolored blackbird, yellow-headed blackbird, black-crowned night heron, and western snowy plover. The CNDDB has a recorded occurrence of a nesting tricolored blackbird colony within the Project area within the constructed basin. Black-crowned

night heron nest in rookeries, and as previously noted, CNDDB reports a rookery from the Blakeley Canal in the northwest portion of the Study Area, while a second potential rookery was identified in the Biological Resources Assessment in a stand of tamarisk near Blakeley Reservoir. Additionally, yellow-headed blackbirds are known to nest regionally, with a known nest site within 2.5 miles of the Project area in emergent wetland vegetation. Where cattails, bulrushes, and reeds are present on the Project area, yellow-headed blackbirds could breed. Western snowy plover is known to nest in the region adjacent to agricultural drainwater ponds, canals, alkali lakes, and levees. During the operational phase of the Project, waterbirds are anticipated to be attracted to the Kettleman Reservoir when full of water. As such, the proposed Project has the potential to impact these species. Below is a discussion of the potential direct and indirect impacts to these species from implementation of the proposed Project. For the purpose of this analysis, tricolored blackbird, yellow-headed blackbird, black-crowned night heron, and western snowy plover habitats consist of those habitats discussed in Section 3.5.1.

Direct Impacts to Riparian, Marsh, and Shoreline Birds

Construction

All Facilities

Operation of the Project also could affect nesting birds. During maintenance activities, riparian shrubs and the constructed basin would be disturbed during excavation to construct conveyances and to build levees to create the storage reservoir cells. If present and nesting during construction, direct impacts to the tricolored blackbird, yellow-headed blackbird, black-crowned night heron, and western snowy plover could include nest destruction or nest failure, as well as permanent and temporary conversions of suitable nesting habitat. Activities associated with the construction of the new proposed facilities listed in Section 2.4 would result in a loss of nesting vegetation as well as permanent or temporary impacts of approximately 1,025.67 acres of tricolored blackbird nesting habitat, 1,025.67 acres of yellow-headed blackbird nesting habitat, and up to two heron rookeries for activities associated with construction of the new reservoir and pumping station as well as improvements that would occur within existing canals and ditches.

Work during the breeding season (typically February 1 through September 15) could result in the destruction or abandonment of nests, eggs, or young. Active nests could be removed, trampled, or crushed by construction and use of access roads during construction. In addition, the noise, vibration, and movement of construction equipment and personnel in close proximity to the active nests of these species could cause adults to abandon eggs or young.

Disturbance caused by construction activities could also result in the loss of foraging habitat, and the disruption of normal foraging and nesting behavior leading to reduced reproductive success and possibly nest abandonment. Most of these impacts would occur during the construction phase.

Operations and Maintenance

All Facilities

Direct impacts to the tricolored blackbird, yellow-headed blackbird, black-crowned night heron, and western snowy plover from maintenance activities would be similar to those of construction and could include nest destruction or nest failure. These impacts could occur through vegetation maintenance within the various canals, ditches or the reservoir.

During operations, the storage cells are expected to hold water periodically, and in some years, a net increase in shoreline and associated emergent vegetation around basin habitat is anticipated. In addition, new habitat for waterbirds would be created when the Kettleman Reservoir is full of water. In those years, the Project would result in a net increase in potentially suitable nesting and/or forage habitat. Operation of the proposed Project will likely incur a benefit to the tricolored blackbird, yellow-headed blackbird, western

snowy plover, and black-crowned night heron as inundation could increase the amount of nesting habitat within the site compared to what is currently available. The Project would also provide new forage and nesting habitat for waterbirds. However, the frequency with which basins would be inundated can only be estimated (generally three years out of each decade), and in intervening years, suitable nesting habitat may not be present due to recruitment of annual upland vegetation. This is similar to existing conditions in which constructed basins and ditches are inundated in only some years.

During operations when the Kettleman Reservoir is full, the opportunity for avian botulism to occur within the Project area could increase because of the presence of shallow water, water temperatures ranging between 30° to 37° Celsius during the late spring through early fall, and the presence of decaying organic matter within the reservoir.

Indirect Impacts to Riparian, Marsh, and Shoreline Birds

Construction

All Facilities

Indirect impacts from construction activities could occur from noise and increased activities if a nest is present in close proximity to construction. Construction related noise can disrupt the behavior of nesting adults and therefore can indirectly lead to the failure of the nest. In addition, increased human activity could attract predators, such as coyotes and ravens, through leaving of trash (especially food trash). Predators, such as coyotes and ravens, can cause a nest to fail by predating upon eggs or young.

Operations and Maintenance

All Facilities

Indirect impacts to the tricolored blackbird, yellow-headed blackbird, black-crowned night heron, and western snowy plover from operations and maintenance activities would be similar to those discussed above and would include potentially detrimental changes in behavior leading to nest failure that could be due to increased human activity and noise as well as increasing the prevalence of predators.

Operation of the proposed Project would not likely incur long-term detrimental effects to the tricolored blackbird, yellow-headed blackbird, and black-crowned night heron. Considering the amount of foraging habitat and other potential nesting sites in the region, as well as the increase in potential nesting habitat that would likely result during inundation of the proposed reservoirs, seasonal vegetation maintenance that could affect suitable nesting habitat the proposed Project would not be expected to cause a long-term decline in the species.

Because the Project area currently has limited potential nest habitat for western snowy plover, no known nesting individuals, and the operations phase would have increased potential nest habitat in at least some years, the Project is not expected to result in long term decline in population viability and carrying capacity.

Western Spadefoot

As discussed above, the Project area contains suitable habitat (both breeding and upland habitat) for the western spadefoot. As such, the proposed Project has the potential to impact this species. Below is a discussion of the potential direct and indirect impact to this species from implementation of the proposed Project. For the purpose of this analysis, western spadefoot habitat consists of those habitats discussed in Section 3.5.1.7.

Direct Impacts to Western Spadefoot

Construction

All Facilities

If present, direct impacts to the western spadefoot include mortality, injury as well as permanent and temporary conversions of suitable habitat. During construction, injury and mortality could occur during clearing and grubbing, grading, trenching or other earthwork-like activities. In addition, injury or mortality could occur as a result of collisions with vehicles or construction equipment, entrapment in trenches and excavations, or exposure to spilled or leaked industrial chemicals, fuels, and lubricants.

Construction of the proposed reservoir and conveyance channels in and of themselves would temporarily impact and modify existing habitat; however, operation of these facilities, when water is diverted, would result in a loss of upland habitat and an increase in potential breeding habitat for the period of inundation if areas are flooded for extended periods of time. The maximum potential loss of upland habitat from inundation is presented and discussed below in the *Operation and Maintenance* section.

Operations and Maintenance

All Facilities

Direct impacts to the western spadefoot from maintenance activities would be similar to those of construction, including unearthing individuals during grading and other earth moving maintenance activities. In addition, if maintenance activities, such as vegetation maintenance within the various canals, ditches or the reservoir, as well as deepening within these features occurs within the breeding season, larval western spadefoot could be injured or killed by equipment.

Operation of the proposed Project by inundation of proposed conveyance channels and reservoirs would concurrently decrease the amount of suitable upland habitat and increase the amount of potentially suitable breeding habitat of approximately 15,128 acres.

Indirect Impacts to the Western Spadefoot

Construction, Operations, and Maintenance

All Facilities

Construction and operations and maintenance of the proposed Project would not indirectly impact the Western Spadefoot.

Northern Western Pond Turtle

As discussed above, the Project area contains suitable habitat (nesting, aquatic and upland habitat) for the northern western pond turtle. As such, the proposed Project has the potential to impact this species. Below is a discussion of the potential direct and indirect impact to this species from implementation of the proposed Project. For the purpose of this analysis, northern western pond turtle habitat consists of those habitats discussed in Section 3.5.1.7.

Direct Impacts to the Northern Western Pond Turtle

Construction

All Facilities

If present, direct impacts to the northern western pond turtle include mortality, injury, nest destruction as well as permanent and temporary conversions of suitable habitat. During construction, injury and mortality could occur during clearing and grubbing, grading, trenching or other earthwork-like activities in the vicinity of aquatic habitat. In addition, injury or mortality could occur as a result of collisions with vehicles or construction equipment, entrapment in trenches and excavations, or exposure to spilled or leaked industrial chemicals, fuels, and lubricants.

Construction of the proposed reservoir and conveyance channels in and of themselves would temporarily impact and modify existing habitat; however, operation of these facilities would result in a loss of upland habitat and an increase in potential breeding habitat for the period of inundation if areas are flooded for extended periods of time. The maximum potential loss of upland habitat from inundation is presented and discussed below in the *Operation and Maintenance* section, below.

Operations and Maintenance

All Facilities

Direct impacts to the northern western pond turtle from maintenance activities would be similar to those of construction including mortality or injury during grading and other earth moving maintenance activities. In addition, injury or mortality or nest destruction can occur from vegetation maintenance within or adjacent to the various canals, ditches or the reservoir, as well as deepening within these features.

Operation of the proposed Project by inundation of proposed conveyance channels and reservoirs would concurrently decrease the amount of suitable upland habitat and increase the amount of potentially suitable breeding habitat of approximately 8,720 acres.

Indirect Impacts to the Northern Western Pond Turtle

Construction, Operations, and Maintenance

All Facilities

Construction and operations and maintenance of the proposed Project would not indirectly impact the Northern Western Pond Turtle.

San Joaquin Coachwhip

As discussed above, the Project area contains suitable habitat for the San Joaquin coachwhip. As such, the proposed Project has the potential to impact this species. Below is a discussion of the potential direct and indirect impact to this species from implementation of the proposed Project. For the purpose of this analysis, San Joaquin coachwhip habitat consists of those habitats discussed in Section 3.5.1.7.

Direct Impacts to the San Joaquin Coachwhip

Construction

All Facilities

If present, direct impacts to the San Joaquin coachwhip include mortality, injury, displacement (through destruction of burrows), as well as permanent and temporary conversion of suitable habitat. During construction, injury and mortality could occur during clearing and grubbing, grading, trenching or other earthwork-like activities. In addition, injury or mortality could occur as a result of collisions with vehicles or construction equipment, entrapment in trenches and excavations, or exposure to spilled or leaked industrial chemicals, fuels, and lubricants.

Activities associated with the construction of the new proposed facilities listed in Section 2.4 would result in a loss or permanent modification of San Joaquin coachwhip habitat. Permanent above-ground facilities discussed in Section 2.4, such as the new electrical substation, pumping plants and maintenance yard, would incur a permanent conversion of habitat resulting in a loss of approximately 3,180 acres. Construction of the proposed reservoir and conveyance channels in and of themselves would temporarily impact and modify existing habitat; however, operation of these facilities when water is diverted would result in a loss of habitat for the period of inundation. The maximum potential loss from inundation is presented and discussed below in the *Operation and Maintenance* section, below.

Operations and Maintenance

All Facilities

Direct impacts to the San Joaquin coachwhip from maintenance activities would be similar to those of construction and would include mortality, injury, displacement, and harassment, along with temporary disturbances to suitable habitat. These impacts could occur through clearing and grubbing, grading, mowing, trenching or other earthwork-like activities. In addition, injury or mortality could occur as a result of collisions with vehicles or construction equipment, entrapment in trenches and excavations, or exposure to spilled or leaked industrial chemicals, herbicides, fuels, and lubricants.

Operation of the proposed Project through inundation could cause San Joaquin coachwhip mortality, if present within the area of inundation, through flooding of occupied burrows or of individuals on the surface that cannot escape rising water levels.

Operation of the proposed Project would result in permanent impacts to up to 13,131 acres of San Joaquin coachwhip habitat. Flooding of the Project area, specifically the proposed reservoir and new conveyance systems, would remove habitat for this species while the area is flooded. Although significant changes to San Joaquin coachwhip habitat would occur within the Project area during flooding, this species may reoccupy these areas when they do not contain water.

Indirect Impacts to the San Joaquin Coachwhip

Construction, Operations, and Maintenance

All Facilities

Construction and operations and maintenance of the proposed Project would not indirectly impact the San Joaquin Coachwhip.

American Badger

As discussed above, the Project area contains suitable habitat for the American badger. As such, the proposed Project has the potential to impact this species. Below is a discussion of the potential direct and indirect impacts to this species from implementation of the proposed Project. For the purpose of this analysis, American badger habitat consists of those habitats discussed in Section 3.5.1.7.

Direct Impacts to the American Badger

Construction

All Facilities

Direct impacts to American badger include mortality, den destruction, injury, displacement, and harassment, along with permanent and temporary conversion of suitable habitat. During construction, destruction of American badger dens (including natal dens), if present, could occur during clearing and grubbing, grading, trenching or other earthwork-like activities. Dens could also be collapsed by Project vehicles or equipment driving over them. In addition, injury or mortality could occur as a result of collisions with vehicles or construction equipment, entrapment in trenches and excavations, or exposure to spilled or leaked industrial chemicals, fuels, and lubricants.

Activities associated with the construction of the new proposed facilities listed in Section 2.4 would result in a loss or permanent modification of American badger habitat. Permanent above-ground facilities discussed in Section 2.4, such the new electrical substation, pumping plants and maintenance yard, would incur a permanent conversion of habitat resulting in a loss of approximately 3,180 acres. Construction of the proposed reservoir and conveyance channels in and of themselves would temporarily impact and modify existing habitat; however, operation of these facilities when water is diverted would result in a loss of

habitat for the period of inundation. The maximum potential loss from inundation is presented and discussed below in the *Operation and Maintenance* section, below.

Operations and Maintenance

All Facilities

Direct impacts to the American badger from maintenance activities would be similar to those of construction and would include mortality, den destruction, injury, displacement, and harassment, along with temporary disturbances to suitable habitat. These impacts could occur through clearing and grubbing, grading, trenching or other earthwork-like activities. Dens could also be collapsed by Project vehicles or equipment driving over them, if present. In addition, injury or mortality could occur as a result of collisions with vehicles or construction equipment, entrapment in trenches and excavations, or exposure to spilled or leaked industrial chemicals, herbicides, fuels, and lubricants. If rodenticides are used as part of the Project's rodent control program, mortality could occur if American badgers ingest small mammals contain these poisons.

Operation of the proposed Project through inundation would displace any American badger within the proposed areas of inundation. American badgers could be killed as a direct result of inundation. In addition, if inundation were to begin during the breeding season and an active natal den were present, flooding has the potential to cause pup mortality.

Operation of the proposed Project would result in permanent impacts to up to 13,131 acres of American badger habitat providing potential foraging, dispersal and denning habitat. Flooding of the Project area, specifically the proposed reservoir and new conveyance systems, would eliminate denning and foraging habitat while the area is flooded and would prevent movement and foraging across the site. Although significant changes to the grassland vegetation would occur within the Project area during flooding, American badgers may continue to use the site for denning, foraging, and dispersal when these areas do not contain water. When areas are flooded for extended period of time, they would be degraded as habitat for American badger due to changes in vegetation structure and composition as well as loss of prey base. The degradation would remain unless there was sufficient time between inundations in which successional processes as well as recolonization of prey species could occur.

Indirect Impacts to the American Badger

Construction, Operations, and Maintenance

All Facilities

Construction and operations and maintenance of the proposed Project would not indirectly impact the American Badger.

Loggerhead Shrike and other nesting birds

Grasslands, fallowed fields and pasture, riparian areas, and portions of the canals, ditches, and basins that have recruited emergent vegetation, willows, or tamarisk provide potentially suitable foraging and/or nesting habitat for a variety of native birds. In addition to the previously discussed avian wildlife, suitable foraging and/or breeding habitat for other special status raptors and bird species is present, including suitable habitat for loggerhead shrike. Many other common native bird species that are protected under state and federal law during nesting could also occur and nest on-site. Despite regular disturbances on the Project area, suitable habitat for nesting is abundant, and there is a moderate to high likelihood of birds nesting within the Project area.

Loggerhead shrikes were observed foraging and perching on the Project area during surveys. This species can use the valley saltbush scrub, annual grassland, and fallowed field/pasture, as well as

ruderal/disturbed areas, for foraging. Nesting habitat could occur within any portion of the Study Area containing trees or shrubs, including stands of tamarisk that have recruited to some drains, ditches and basins.

Direct Impacts to the Loggerhead Shrike and other nesting birds

Construction

All Facilities

Direct impacts could include the mortality or injury of special status bird species and other native birds, the loss of foraging habitat, and the disruption of normal foraging and nesting behavior leading to reduced reproductive success and possibly nest abandonment. Most of these impacts would occur during the construction phase.

If any migratory bird (common species, raptors, or other special status birds) nests in areas where direct construction disturbance would occur, work during the breeding season (typically February 1 through September 15) could result in the destruction or abandonment of nests, eggs, or young. Active nests could be removed, trampled, or crushed by construction and use of access roads during construction; in addition, the noise, vibration, and movement of construction equipment and personnel in close proximity to the active nests of these species could cause adults to abandon eggs or young. Loss of foraging habitat could also negatively affect nesting raptors and other bird species.

Operations and Maintenance

All Facilities

Operation of the Project also could affect nesting birds. During maintenance activities, birds would be subject to impacts, including mortality from vehicle strikes, disturbance from vegetation management activities, potential disruption of nest sites, noise from facility operations, and human disturbance. Sudden increases in water levels could flood nests in the event of late winter or early spring inundation events.

Indirect Impacts to the Loggerhead Shrike and other nesting birds

Construction, Operations, and Maintenance

All Facilities

Indirect impacts to raptors and other special status bird species, such as long-term declines in reproductive success and risks to local population viability for regionally bird populations, could occur if foraging habitat and breeding behavior were sufficiently disrupted over the life of the Project. However, based on the extent of foraging habitat in the region and lack of breeding habitat on and immediately adjacent to the Project area, population-level impacts are unlikely. The Project could also indirectly affect smaller raptors and other special status bird species through increased availability of perches for, and a resulting increase in predation activity of, larger raptors.

Kings River and San Joaquin River Fisheries

As previously noted, the proposed Project would divert up to 2,200 cfs of surface water into the South Fork of the Kings River during flood flow events that would otherwise be diverted to the James Bypass. Approximately 30 percent of this flow would be lost, up to approximately 1,540 cfs reduction in flood flows in the San Joaquin River at the Vernalis flow gage although the amount would in reality be less with evaporation. This would potentially reduce flows to the San Joaquin River in three out of 10 years, potentially impacting fisheries downstream of Army Weir and in the San Joaquin River.

Direct Impacts to the Kings River and San Joaquin River Fisheries

Construction, Operations, and Maintenance

All Facilities

Construction and operations and maintenance of the proposed Project would not indirectly impact species identified as a candidate, sensitive, or special status species or their habitat.

Indirect Impacts to the Kings River and San Joaquin River Fisheries

Construction

All Facilities

Indirect impacts from construction activities from the proposed Project would not directly impact species identified as a candidate, sensitive, or special status species or their habitat as project construction would take place over 10 miles from the proposed diversion location (Army Weir) and as project construction that would most likely impact surface flows would occur when surface flow rates were the lowest.

Operations and Maintenance

All Facilities

Indirect impacts associated with operation of the proposed Project would be associated with reduced diversions from the Kings River to James Bypass at Army Weir. Impacts would typically fall into one of five categories: effects on resident fish inhabiting the Kings River, effects on juvenile Chinook salmon survival, effects to adult Chinook salmon escapement, effects to habitat in the river and Delta, and impacts to X2 salinity zone.

Effects to Resident Fish Inhabiting the Kings River

Resident fish inhabiting the Kings River are frequently displaced downstream into the lower river by high flood flow events (ECORP, 2007). The proposed Project would reduce water diversions on average three out of every 10 years. Assuming that losses would be proportional to the change in flow rates, that warm water fish would continue to inhabit upstream areas with a sustained surface water supply, would continue to reproduce and disperse downstream when flow conditions permit, and that many of these species are not harvested in the local recreational fishery, the proposed Project would incrementally increase losses of resident fish but the magnitude and frequency of losses would be less than significant.

Effects on Juvenile Chinook Salmon Survival

Previous studies of juvenile salmon survival in the San Joaquin River clearly show that the presence of the Head of Old River Barrier (HORB), used to keep juvenile salmon from migrating into Old River, greatly increases the likelihood of survival. The survival studies conducted on the San Joaquin River have shown an inconsistent relationship between river flow and survival. The relatively high variability in the relationship between salmon survival and San Joaquin River flow, especially when the HORB is not installed, suggests that the predicted small change in survival is well within the observed variability in survival rates and would not be detectable in the river. The incremental affect in flood flows discharged into the San Joaquin River during the juvenile Chinook salmon migration period was concluded to be less than significant.

Effects to Adult Chinook Salmon Escapement

The correlation between the springtime flow measured at the United State Geological Survey (USGS) Vernalis gage and returning adult Chinook escapement 2.5 years later show a positive trend and predict that a reduction in San Joaquin River flow will contribute to a reduction in the number of adult salmon returning

into the San Joaquin River tributaries to spawn. Chinook salmon primarily migrate downstream in April and May as smolt-sized juveniles. Assuming a full Project diversion in April and May, the predicted change in adult salmon escapement, as calculated by the regression for river flow conditions during the juvenile outmigration period in 4 out of 20 years, under the proposed Project operations totaled 8,553 adult salmon assuming a 30% channel loss. The actual adult salmon escapement to the San Joaquin River basin varies substantially among years.

The estimated reduction in adult escapement as a result in the reduction in James Bypass discharges to the San Juaquin River was conservatively estimated to be 3.7% under the proposed Project operations assuming a 30% channel loss. Based on estimated reductions in discharges to the San Joaquin River and predicted reductions in adult escapement in 4 out of 20 years, and the naturally high annual variation in salmon abundance in the San Joaquin River watershed, the incremental change in estimated escapement is considered to be less than significant, but would contribute to cumulative effects on Central Valley Chinook salmon population dynamics.

Effects to Habitat in the River and Delta

Changes in water depth as a function of river flow were used as an indicator of potential changes in habitat conditions and availability for juvenile salmon and other resident and migratory fish species. As flow increased through the San Joaquin River, the stage height, and associated useable habitat increase as well. The reduction in river stage height (a reflection of water depth in the river) associated with a reduction in James Bypass flood water discharges from the proposed Project operations was estimated to reduce water elevation by approximately 1 foot or less. Much of the San Joaquin River channel has been incised or constrained by levees. Under these conditions the predicted change in river stage would not be expected to result in biologically meaningful reductions in the quantity or quality (e.g., wetted channel width) of habitat for fish within the river. Based on the channel configuration and the frequency of reductions in flood flows, the impact of the flow reduction on habitat in the mainstem San Joaquin River was considered to be less than significant.

Impacts to X2 Salinity Zone and Longfin Smelt

Habitat conditions for fish and other aquatic resources inhabiting the Delta and estuarine regions of the system have frequently been linked to the location of the low salinity zone. One indicator of the low salinity zone is the location, in kilometers upstream from the Golden Gate Bridge, where bottom salinity is 2 psu (referred to as X2 location). The location of the low salinity zone in the estuary is a function of the tides moving saltwater upstream from the ocean and bays and the magnitude of freshwater moving downstream from the Sacramento, San Joaquin, and other Central Valley rivers (referred to as Delta outflow). The relationship between Delta outflow and X2 location was used to assess the potential magnitude in changes of X2 location with and without the proposed diversions of flood flows under the water storage project. The analysis focused on X2 location during the biologically sensitive spring months of February-May.

The steady-state equation for the location of X2, as a function of Delta outflow, was used in the analysis to estimate the change in X2 location as a function of reduced San Joaquin River flow contributing to Delta outflow. For purposes of this analysis, it was assumed that SWP and CVP exports would not change, and therefore a reduction in San Joaquin River flow was estimated to result in a directly proportional reduction in Delta outflow and an upstream movement of X2 location. A base Delta outflow of 20,000 cfs was assumed in the analysis. The change in X2 location was then calculated as the incremental change in estimated X2 location between baseflow conditions and with upstream diversions during February-May reducing James Bypass discharges.

For purposes of this analysis, a change in predicted X2 location of less than 0.5 km was assumed to be within the natural environmental variation in estuarine salinity and habitat. The predicted change in X2

location, a reflection of the low salinity zone habitat for estuarine fish and other organisms, was estimated to move upstream in 5 out of 20 years an average of 0.12 km over the 20-year period included in the analysis under proposed Project operations assuming 30% channel losses. The magnitude of upstream movement of X2 location varied substantially among years, however, no changes in X2 location occurred in 15 out of 20 years included in the hydrologic model. The magnitude of these changes would not be detectable in the field given the natural variation in X2 location based on variation in tidal conditions. The magnitude of upstream movement of X2 in this assessment is expected to contribute to cumulative changes in estuarine habitat, but individually have no detectable effect on habitat quality or availability in the estuarine low salinity zone or on the aquatic species that inhabit the low salinity zone. The Sacramento River flows are the dominant factor in determining the location of X2 while changes in San Joaquin River flows, typically because of the smaller magnitude of flow, has a smaller effect. The impact of the flood water flow reduction is incrementally less than significant but would contribute to cumulative effects on low salinity habitat conditions in the estuary.

Longfin smelt, a species listed as threatened under the California Endangered Species Act (CESA), spawn and rear in the Bay-Delta estuary. Longfin smelt abundance has been shown to be strongly correlated with Delta outflow and the X2 location (location of the 2 psu salinity in km upstream from the Golden Gate Bridge). Hydrologic modeling predicted that a reduction in James Bypass discharges to the San Joaquin River during the February-May period would have occurred in 5 out of 20 years included in the analysis. Under these conditions the estimated fall mid water trawl abundance index would have been reduced an average of 1.0% over the 20 years included in the analysis assuming proposed Project operations and 30% channel losses. Given the variability in the flow-abundance relationship, typically high Delta outflow during the winter-spring period when longfin smelt are spawning and larvae are rearing in the estuary, and the low frequency that diversions between February and May occur, it is expected that the proposed Project would contribute to the cumulative effects of factors affecting habitat conditions for longfin smelt in the Bay-Delta estuary, but that the incremental effect of proposed floodwater diversions on longfin smelt population abundance would individually be less than significant.

Significance Determination before Mitigation

No special status plants are currently known to occur in the project footprint; however, a previously reported occurrence of San Joaquin woollythreads is near the proposed Aqueduct Intertie at the southwest corner of the Project area. Because of the low number of extant occurrences of regionally-occurring special status plants in Kings County, direct impacts to special status plant species, should they occur, resulting from implementation of the Project would be *significant but mitigatable (Class II)*. Indirect impacts due to invasion by non-native invasive plant species and changes to the habitat conditions on the Project area would be considered permanent, and would be *significant but mitigatable (Class II)*.

Due to their regional and statewide rarity, the loss of habitat, as well as the loss of individuals as a result of construction and operation activities, would constitute a significant impact on San Joaquin kit fox, blunt-nosed leopard lizard, Nelson's antelope squirrel, western snowy plover, and Swainson's hawk; impacts would be *significant but mitigatable (Class II)*.

Due to their regional and statewide rarity, the loss of habitat, as well as potential cyclical losses of additional individuals of giant and Tipton's kangaroo rats due to recolonization following inundation events, impacts would be considered *significant but mitigatable (Class II)*.

The potential loss of individual American badger, western spadefoot, white tailed kite, San Joaquin coachwhip, burrowing owl, Tulare grasshopper mouse, and reduction in habitat, could substantially reduce the number and the viability of regional populations of these species. This impact would be *significant but mitigatable (Class II)*.

The potential loss of individual tricolored blackbird, yellow-headed blackbird, and northern western pond turtle, could significantly reduce the number and the viability of local populations of these species. This impact would be *significant but mitigatable (Class II)*.

The potential impact of avian botulism on bird species would be *significant but mitigatable (Class II)*.

Project impacts to other nesting bird species would be *significant but mitigatable (Class II)*.

Mitigation Measures

A number of special status species that may be impacted are listed by USFWS and/or CDFW. To obtain take coverage, Semitropic would need to consult with USFWS and CDFW regarding potential impacts to San Joaquin kit fox, giant kangaroo rat, Tipton kangaroo rat, Nelson's antelope squirrel, Swainson's hawk, tricolored blackbird and western snowy plover. Permits obtained through consultation may include compensatory mitigation, avoidance and minimization measures in addition to those outlined below. Where such permits require compensatory mitigation and proposed sites meet the requirements below, such mitigation can be fulfilled in conjunction with requirements for compensatory mitigation below.

Mitigation Measure BIO-1: Nested Compensatory Mitigation

Semitropic shall either purchase credits from a CDFW- and/or USFWS-approved mitigation bank or purchase or use its existing property(ies), develop a long-term management plan, and provide conservation easements or funds for acquisition of conservation easements as compensatory mitigation to offset impacts to listed or special status plants and wildlife (if compensatory mitigation is not fully accomplished at USFWS- and/or CDFW-approved mitigation banks). The compensatory mitigation shall incorporate the conditions specified in authorizations and/or permits that could be issued by the CDFW and/or USFWS for this Project, if any, but shall meet the minimum standards specified in this measure.

Compensatory mitigation for impacts to federal or state listed wildlife species habitat, that are either assumed present or confirmed present on the Project area through protocol-level surveys, shall be provided at a ratio of not less than 1:1 (area mitigated: area impacted) for suitable and marginal habitat. Compensatory mitigation for impacts to occupied SSC habitat shall be provided at a ratio of not less than 1:1 (area mitigated: area impacted). Because the Project would remove the terrestrial habitat during inundation, the Project is treating all suitable and marginal habitat that has been identified within the reservoir as being permanently impacted and has taken the permanent impact into account while determining the mitigation acreage. Compensatory mitigation for multiple species may be combined to mitigate for impacts to multiple species simultaneously (i.e. nested compensatory mitigation). The compensatory mitigation site must provide equal or greater habitat value than the impacted area removed within the Project area.

Compensatory mitigation areas shall have a restrictive covenant prohibiting future development/disturbance and shall be managed in perpetuity to encourage persistence and enhancement of the preserved target species. Compensatory mitigation lands cannot be located on land that is currently held publicly for resource protection. The compensatory mitigation areas shall be managed by a conservation lands management entity or other qualified easement holder.

Semitropic shall either provide conservation easements or provide funds for the acquisition of such easements to a qualified easement holder as defined below. The CDFW and organizations approved by CDFW that meet the criteria below may be considered qualified easement holders for those species for which the CDFW has regulatory authority. To qualify as a "qualified easement holder," a private land trust must, at a minimum, have:

1. Substantial experience managing conservation easements that are created to meet mitigation requirements for impacts to special status species;
2. Adopted the Land Trust Alliance's Standards and Practices; and
3. A stewardship endowment fund to pay for its perpetual stewardship obligations.

Other specific conditions for qualified easement holders may be outlined in incidental take permits that could be issued by CDFW and USFWS for this Project.

Semitropic shall determine whether a proposed easement holder meets these requirements and shall also be responsible for donating to the conservation easement holder fees sufficient to cover administrative costs incurred in the creation of the conservation easement (appraisal, documenting baseline conditions, etc.) and funds in the form of a non-wasting endowment to cover the cost of monitoring and enforcing the terms of the conservation easement in perpetuity. The amount of these administrative and stewardship fees shall be determined by the conservation easement holder in consultation with Semitropic.

The primary purpose of the conservation easement(s) shall be conservation of impacted species and habitats, but the conservation easement(s) shall also allow livestock grazing when and where it is deemed beneficial for the habitat needs of impacted species. Conservation easement(s) shall be held in perpetuity by a qualified easement holder (as defined above), be subject to the management requirements outlined in the Habitat Mitigation and Monitoring Plan [HMMP] (see measure BIO 1-2), and be subject to a legally binding agreement that shall: (1) be recorded with the County Recorder(s); and (2) contain a succession clause for a qualified easement holder if the original holder is dissolved.

Land Acquisition Requirements. The following factors shall be considered in assessing the quality of potential mitigation habitat: (1) current land use, (2) location (e.g., habitat corridor, part of a large block of existing habitat, adjacency to source populations, proximity to potential sources of disturbance), (3) vegetation composition and structure, (4) slope, (5) soil composition and drainage, and (6) level of occupancy or use by all relevant species. To meet the requirement that the mitigation habitat is of value equal to or greater than the habitat impacted on the Project area, the mitigation habitat must be either "suitable habitat" or "enhanced habitat":

Suitable Habitat. To meet the requirements for suitable habitat that provides equal or greater habitat value for special status animal species than the impacted habitat, the habitat must:

1. Provide habitat for special status animal species, such that special status animal species populations can regenerate naturally when disturbances are removed;
2. Not be characterized by (or adjacent to areas characterized by) high densities of invasive species, such as yellow star-thistle or species that might jeopardize habitat recovery and restoration;
3. Not contain hazardous wastes that cannot be removed to the extent that the site could not provide suitable habitat; and
4. Not be located on land that is currently publicly held for resource protection.

Enhanced Habitat. If suitable habitat is unavailable, or in lieu of acquiring already suitable special status animal species habitat, Semitropic may enhance potential habitat that:

1. Is within an area with potential to contribute to habitat connectivity and build linkages between known special status species populations;
2. Consists of actively farmed land or other land containing degraded habitat that would support enhancement;

3. Supports suitable soils, slope, and drainage patterns consistent with special status animal species requirements;
4. Cannot be located on land that is currently held publicly for resource protection; and
5. Does not contain hazardous wastes or structures that cannot be removed to the extent that the site could not provide suitable habitat.

Enhanced Habitat Standards. For enhanced habitat conditions to equal or exceed habitat conditions on the Project area, the enhanced habitat shall meet the following habitat criteria. After five years, these sites must consist of annual grasslands, other grassland vegetation, suitable aquatic habitat, suitable foraging habitat (e.g. habitat is within 10 miles of known nesting golden eagles) or other habitat characteristics (e.g. suitable burrows for burrowing owls, small mammal burrows in upland habitat, for blunt-nosed leopard lizards, etc.) that are consistent with the known ecology of the special status animal species to which compensatory mitigation is being applied. Alternatively, Semitropic shall purchase the requisite number of credits at an approved mitigation bank for the affected species.

Mitigation Timing: Semitropic shall calculate the total acreages required to meet all compensatory mitigation obligations prior to the issuance of building permits. Semitropic shall then identify and approve the location of mitigation lands, the holder of conservation easements, and the restrictions contained in the easement(s) created for the permanent protection of these lands. Documentation of recorded easement(s) shall be approved by Semitropic prior to the first of the Project's final inspections or within 18 months after issuance of building permits, whichever comes first. Verification of having met habitat mitigation requirements shall be reviewed and approved prior to final inspection.

Monitoring: Semitropic shall review documentation of compensatory mitigation land acquisition and associated restrictive covenant for consistency with conditions outlined in the measure. These lands may be identified through independent consultation with CDFW and/or USFWS.

Mitigation Measure BIO-2: Habitat Mitigation and Monitoring Plan

To ensure the success of compensatory mitigation sites required for compensation of permanent impacts to vegetative communities and listed or special status plants and wildlife (if compensatory mitigation is not fully accomplished at USFWS- and/or CDFW-approved mitigation bank(s)), Semitropic shall retain a qualified biologist to prepare a Habitat Mitigation and Monitoring Plan. The HMMP shall be prepared and approved by Semitropic within 12 months after the issuance of project permits. The HMMP shall include, at a minimum, the following information:

1. A summary of habitat and species impacts and the proposed mitigation for each element;
2. A description of the location and boundaries of the mitigation site(s) and description of existing site conditions;
3. A description of any measures to be undertaken to enhance (e.g., through focused management) the mitigation site for special status species;
4. Identification of an adequate funding mechanism for long-term management and identification of a conservation lands management entity to manage the conservation easement lands;
5. A description of management and maintenance measures intended to maintain and enhance habitat for the target species (e.g., weed control, fencing maintenance);
6. In areas subject to grazing management, compilation of a dedicated, site-specific managed grazing plan, prepared by a Certified Rangeland Manager, for grassland habitats within the mitigation site(s) employing Residual Dry Matter (RDM) monitoring and a description of the adaptive management scheme for this plan;

7. A description of habitat and species monitoring measures on the mitigation site, including specific, objective performance criteria, monitoring methods, data analysis, reporting requirements, monitoring schedule, etc. Monitoring shall document compliance with each element requiring habitat compensation or management;
8. A contingency plan for mitigation elements that do not meet performance or final success criteria within described periods. The plan shall include specific triggers for remediation if performance criteria are not met and a description of the process by which remediation of problems with the mitigation site (e.g., presence of noxious weeds) shall occur. This contingency plan shall identify associated follow-up monitoring needs beyond the initial three years post-construction if remedial actions are required;
9. A requirement that Semitropic shall be responsible for monitoring, as specified in the HMMP, for at least three years post-construction or until success of the compensatory lands (especially enhanced habitats) as described in the HMMP can be shown. During this period, regular reporting shall be provided to Semitropic;
10. Reporting shall include:
    a. an annual monitoring report to be submitted to Semitropic; and
    b. for any species listed under the FESA or CESA, demonstration that the compensatory mitigation and management (1) would fully mitigate for any take of a CESA-listed species as defined by CESA, (2) minimize and mitigate any take of an FESA-listed species to the maximum extent practicable as defined by FESA, and (3) ensure that impacts from the Project are not likely to jeopardize the listed species continued existence as defined by FESA.

Mitigation Timing: The HMMP and/or proof of mitigation bank credit purchase shall be completed by Semitropic, and be approved by Semitropic Board prior to the first of the Project's final inspections, or within 12 months after issuance of building permits, whichever comes first.

Monitoring: Semitropic shall ensure that all components of the HMMP are fully implemented.

Mitigation Measure BIO-3: Preconstruction Special Status Rare Plant Surveys

Prior to initial ground disturbance, all temporary and permanent disturbance areas that contain potentially suitable habitat for special status plants (i.e. annual grassland, saltbush scrub, and areas fallow for the preceding five years) shall be surveyed for special status plant species. The surveys shall be conducted in accordance with accepted protocols established by the USFWS, CDFW, and CNPS. The surveys shall be floristic in nature and shall be timed to coincide with the bloom period for the target species. All special status plant species observed shall be fully described and mapped on a site-specific aerial image. All special status plant species observation information shall be submitted to the CNDDB.

If there is a lapse in time of greater than two years between the completed protocol surveys and the initiation of ground disturbance, all applicable temporary and permanent disturbance areas shall be resurveyed to confirm the populations of special status plant species previously documented on-site and to provide updated and current information on rare plant occurrences necessary to the HMMP (see below). The largest extent of special status plant species documented shall be used to determine the mitigation requirements, regardless of which year the survey was conducted.

Mitigation Timing: Semitropic shall conduct seasonally-timed preconstruction special status plant surveys within the suitable habitat areas prior to construction of the Project.

Monitoring: Semitropic shall ensure that the surveys are completed within appropriate survey windows prior to start of construction and prior to obtaining building permits.

Mitigation Measure BIO-4: Special Status Plant Species Avoidance and Minimization
Federally- and state-listed plant species were not identified during 2016 site survey; however, protocol surveys were not completed. If listed plants are identified during future survey efforts within the Project area, as conducted under BIO-3, avoidance shall be required to the maximum extent feasible. Semitropic shall, in consultation with a qualified plant ecologist, design, construct, and operate the Project to minimize impacts to all populations of California jewelflower (CRPR list 1B.1) and San Joaquin woollythreads (CRPR list 1B.2) within the Project impact area or within 50 feet of the Project impact area. If impacts cannot be fully avoided, Semitropic shall either purchase credits at an appropriate mitigation bank approved for the affected species or develop a Special Status Plant salvage and restoration plan in cooperation with USFWS and/or CDFW.

Impacts to all other CRPR 1B special status plant species shall be avoided or minimized to the greatest extent feasible. Where flexibility exists in placement of levees and construction of interties, these features shall be sited to avoid direct impacts to special status plants. Laydowns and access routes shall avoid special status plants. All known special status plant populations present within the limits of disturbance, or within 100 feet of the limits of disturbance, shall be clearly depicted on Project plan sets. Prior to ground disturbance or vegetation removal in areas where special status plant populations are to be avoided, the limits of work shall be visibly delineated with highly visible orange construction fencing or flagging. Visible delineation markers shall be required where special status plants to be avoided occur within 50 feet of general Project construction access areas, or within 100 feet of grading. The avoidance buffers shall be designated Environmentally Sensitive Areas (ESAs) and shall also be shown on Project plan sets. No equipment, vehicles, or personnel are permitted within ESAs without clear permission from a qualified biologist. All ESA fencing shall be maintained intact and in good condition throughout the duration of construction.

Mitigation Timing: Project area plans shall be amended by Semitropic to show ESAs prior to start of construction. ESA fencing shall be installed by Semitropic prior to initiation of all other construction activities, including ground disturbance and staging.

Monitoring: Semitropic shall ensure that the Project area plans show ESAs and that ESA fencing is properly installed. Semitropic shall ensure that ESA fencing is maintained throughout the duration of construction.

Mitigation Measure BIO-5: Compensatory Mitigation for Special Status Plant Species
Where direct impacts to special status plants cannot be avoided through redesign of Project elements, to compensate for significant impacts on special status plant species, offsite habitat occupied by the affected species shall be preserved and managed in perpetuity at a minimum 1:1 mitigation ratio (at least one plant preserved for each plant affected, and also at least one occupied acre preserved for each occupied acre affected). Alternately, the Project may purchase compensatory mitigation bank credits from a mitigation bank benefitting the special status plant species impacted by the Project at a mitigation ratio of 1:1. Mitigation banks or areas proposed for preservation and serving as compensatory mitigation for special status plant impacts must contain verified extant populations of the special status plant species, of similar size and quality, and equal or greater density to the populations that would be impacted by the Project, and should be consistent with the USFWS *Recovery Plan for Upland Species of the San Joaquin Valley* (USFWS, 1998a), if feasible.

Preservation of offsite local populations would ensure that, although the Project could impact some individuals of CRPR 1B, the Project would not result in extirpation of these species from the region, and conserved populations would benefit long-term survival of these species statewide.

Locations of suitable mitigation sites must be identified within the same watershed as the Project, and a technical report must be submitted demonstrating that the same species, approximate number of

individuals, and same acreage of suitable habitat as would be impacted would be preserved. Suitable sites must have similar associate species, soils, and lack extensive populations of noxious weeds. Because populations of annual plants can fluctuate from year to year and are difficult to census over large areas, estimated population of the target species at mitigation sites may vary by up to 10 percent from impacted population estimates, provided calculations are based on population estimates conducted following 2009 CDFW-approved botanical survey protocol. The technical report must identify a species-by-species accounting of individuals and acreage impacted; locations, acreages, and individuals at each proposed mitigation site; botanical survey dates, personnel, mapping and population estimation techniques used to demonstrate site suitability as mitigation for special status plant impacts.

Compensatory mitigation areas shall be located as close to the Project area as feasible, but must also be protected from Project-related ground disturbance by a species- and impact-specific buffer developed by a qualified plant ecologist familiar with the Project actions and with the habitats and plant species present on the Project area. Compensatory mitigation areas for special status plants can be combined with mitigation for multiple species as outlined in measure BIO-1 for nested mitigation. Compensatory mitigation for special status plants shall be consistent with the conditions outlined in measure BIO-1, and be managed and monitored under the HMMP as outlined in measure BIO-2 if compensatory mitigation is not fully accomplished at USFWS- and/or CDFW-approved mitigation bank(s).

If sufficient acreage of suitable quality as previously discussed cannot be protected to conserve CRPR 1B species at a minimum 1:11 ratio for individuals and acreage impacted, the deficit between available suitable mitigation sites and required mitigation numbers and acreage shall be made up through active restoration. A special status plant mitigation restoration plan would be prepared, if needed, to identify suitable locations, methods, and success criteria for special status plant mitigation through direct seeding and restoration of suitable unoccupied habitat. The plan must, at a minimum, require replacement through collection of seed and topsoil from impact sites, a monitoring and management component that outlines weed management and monitoring techniques, and success criteria that require successful establishment of the target species over the acreage and numbers of impacted plants within five years.

If compensatory mitigation for special status plants would involve restoration, then seed shall be collected from impact areas. Sites used for restoration can be located on suitable habitat as outlined in measure BIO-1 for nested mitigation, and be managed and monitored under the HMMP as outlined in measure BIO-2. Alternatively, the Project proponent shall purchase credits to satisfy compensatory mitigation requirements at a rate of one acre credit for each acre of impact. Credits must be obtained from an agency-approved mitigation bank. Credits may be used in whole or in part to satisfy mitigation requirements for special status plants.

Mitigation Timing: A technical report as described above that identifies the total number of plants and acreage impacted and required for mitigation, sites identified for mitigation through conservation, and the special status plant restoration plan, if applicable, and/or proof of agreement for the purchase of mitigation bank credits, must be completed by Semitropic prior to start of construction and before obtaining building permits, or prior to the start of construction for each phase of the Project, should the Project be phased. Semitropic shall complete and approve the restoration plan (if applicable), the location of mitigation lands, the holder of conservation easements, and the restrictions contained in the easement(s) created for the permanent protection of these lands, unless mitigation bank credits are used in full (in which case the other elements are not required). All other timing shall be consistent with measure BIO-1.

Mitigation Measure BIO-6: Invasive Species Management Plan
Before the construction permit is issued, Semitropic shall prepare an Invasive Species Management Plan (IMP) to be administered during construction and operation of the Project. The comprehensive plan shall be intended to prevent the introduction and control the spread of non-native invasive species associated with the disturbance resulting from the Project. The IMP shall be an adaptive management tool; vegetation management strategies and weed control efficacy shall be evaluated over time. Modifications to the strategies used or to the techniques used to accomplish each strategy shall be implemented based on results, experience, and the latest research.

The IMP shall describe Best Management Practices (BMPs) to avoid the unintentional introduction of invasive species to and from the Project area, describe monitoring measures to ensure that any invasions are detected before they become substantial, and describe species-specific control measures that shall be implemented if invasions occur. The IMP shall address the entire Project area and shall describe the process by which the IMP shall be implemented (e.g., the entity responsible for implementing it, funding mechanisms, and reporting procedures). The IMP shall include, but is not limited to, the following:

1. A plan for preventing introduction of new invasive species during construction, including a detailed plan for the washing of all ground-disturbing equipment before it is transported to the site or is used at another site, for washing equipment within the site if it has worked in infested areas before being used elsewhere on the site, and requirements that erosion control measures must be weed free.
2. A description of vegetation control methods and how these methods would be implemented to avoid conflicts with wildlife (e.g. timing restrictions, etc.).
3. A description of annual monitoring stipulated for weeds within the Project area and measures for controlling weeds, both prior to ground disturbance and annually during operation of the project.
4. A plan for the use and application of herbicides, which may be prescribed only by a licensed Pest Control Advisor and applied only by a licensed applicator. Specific prohibitions on herbicide use and application (e.g., no application of herbicides when winds are in excess of 10 miles per hour [mph] or within 50 feet of wetlands), including restrictions on herbicides that may be used when surface water is present, shall be included.
5. A plan to control spread of tamarisk, with consideration for wildlife requirements (e.g. timing restrictions and approved removal methods).
6. Any seed mixes and container stock planted to restore temporary disturbance areas shall consist of native species only.

Mitigation Timing: The IMP shall be completed and approved by Semitropic prior to start of construction.

Monitoring: Semitropic shall ensure that all components of the IMP are fully implemented by Semitropic.

Mitigation Measure BIO-7: Preconstruction Surveys for San Joaquin Kit Fox
No more than 30 days before the start of construction activities, Semitropic shall retain a qualified biologist to conduct preconstruction surveys. The Project area, plus a 500-foot buffer (where Semitropic has access), shall be surveyed, and all known and potential San Joaquin kit fox dens (i.e., suitably sized dens occurring within suitable habitat) shall be mapped. If present, active San Joaquin kit fox dens shall be flagged, and ground-disturbing activities during the construction phase shall be avoided as described in measure BIO-8, unless take authorizations from the USFWS and CDFW have been secured.

Timing: The name, qualifications, scope, and contact information for the surveying biologist(s) must be submitted to Semitropic in advance of the surveys. A report of the results of the San Joaquin kit fox survey shall be submitted to Semitropic for review and approval prior to initiation of ground-disturbing activities.

Monitoring: During the construction phase of the Project, Semitropic shall review and approve the reports and maintain a map of all known or potential dens located within the Project.

Mitigation Measure BIO-8: San Joaquin Kit Fox Den Avoidance and Minimization Measures during Construction

When a suitable subterranean hole (den or burrow) is discovered within the Project area, a qualified biologist would determine if the hole is occupied by a kit fox. Den entrances at least 4 inches in diameter, but not greater than 20 inches, qualify as suitable for kit fox use. The biologist would check to see if the den continues to extend underground at a 6-inch diameter. If the opening narrows quickly to 2-3 inches, then the hole would be considered unusable by kit foxes (it is likely being used by a California ground squirrel and would require extensive modification to be usable by a kit fox). If the den(s) can be immediately identified as recently used by kit fox (based on qualifying signs such as kit fox tracks, scat, and a fresh soil apron extending 4-6 feet from the den entrance), then no further investigation would be conducted and the hole would be considered an occupied den.

Dens with proper dimensions but no obvious sign of occupation would require further investigation. A remote motion-sensing camera would be deployed for at least 3 days to document whether the hole is being used by kit fox. If, after 3 days, no kit foxes are detected and the hole has remained unchanged (no new tracks or excavations are observed), the den would be deemed unoccupied. The den would be considered occupied if a kit fox is photographed using the den frequently or if recent signs of occupation are found.

Per the USFWS Standard Recommendations (2011), the following definitions will apply:

1. "Known den" - Any existing natural den or manmade structure that is used or has been used at any time in the past by a San Joaquin kit fox. Evidence of use may include historical records, past or current radio telemetry or spotlighting data, kit fox sign such as tracks, scat, and/or prey remains, or other reasonable proof that a given den is being or has been used by a kit fox.
2. "Potential Den" - Any subterranean hole within the species' range that has entrances of appropriate dimensions for which available evidence is insufficient to conclude that it is being used or has been used by a kit fox. Potential dens shall include the following: (1) any suitable sized subterranean hole; or (2) any den or burrow of another species (e.g., coyote, badger, red fox, or ground squirrel) that otherwise has appropriate characteristics for kit fox use.
3. "Natal or Pupping Den" - Any den used by kit foxes to whelp and/or rear their pups. Natal/pupping dens may be larger with more numerous entrances than dens occupied exclusively by adults. These dens typically have more kit fox tracks, scat, and prey remains in the vicinity of the den, and may have a broader apron of matted dirt and/or vegetation at one or more entrances. A natal den, defined as a den in which kit fox pups are actually whelped but not necessarily reared, is a more restrictive version of the pupping den.
4. "Atypical Den" - Any manmade structure which has been or is being occupied by a San Joaquin kit fox. Atypical dens may include pipes, culverts, and diggings beneath concrete slabs and buildings.

Buffers shall be established around occupied dens within the Project area under the following conditions for the construction phase of the Project:

1. Occupied dens detected during preconstruction surveys or during construction monitoring would be fenced or flagged at the appropriate buffer distance (described below), to prevent access to the occupied den by construction equipment or non-biologist personnel.
2. Upon completion of construction activities in proximity to a den, all fencing/flagging would be removed to avoid attracting subsequent attention to the dens.
3. All onsite flagging and buffer delineations would be well maintained for the duration of activity in proximity to the den or until the den is determined to be unoccupied, whichever comes first.
4. The following radii would be the San Joaquin kit fox buffer distances in effect within the Project area during Project construction:
    a. Occupied den – 100 feet
    b. Occupied natal/pupping den – 500 feet
    c. Occupied atypical den – 50 feet
5. Within the buffers, only essential vehicle and foot traffic would be permitted. Otherwise, all construction, vehicle operation, material storage, and any other type of surface-disturbing activity would be prohibited within the buffers.
6. All reductions to established restrictive buffer areas (i.e. changes in total area by reducing the radii of the buffer or modifying the circular shape of the buffer) or allowance of additional activities within the restrictive buffers based on specific circumstances (i.e. vegetation, topography, acclimation to existing conditions, or frequency, intensity, or duration of anthropogenic activities) must be authorized by an agency-approved kit fox biologist. Agency approval of the kit biologist must be provided in writing by the agencies after review of the biologist's resume. All authorized reductions to restrictive buffer areas must be reported in writing to the USFWS and CDFW within 24 hours of implementing the change.

Mitigation Timing: Semitropic shall ensure that either no occupied San Joaquin kit fox dens were recorded on the Project area at the time of construction or that appropriate avoidance measures have been implemented to ensure avoidance of occupied or active breeding dens prior to construction. Semitropic would ensure that an Incidental Take Permit covering this species has been issued by CDFW (CESA/California Fish and Game Code Sections 2081(b) and 2081(c)) and a Biological Opinion (FESA Section 7) or Habitat Conservation Plan has been issued by the USFWS.

Monitoring: Semitropic shall ensure that compliance with all San Joaquin kit fox impact avoidance and minimization measures is met.

Mitigation Measure BIO-9: Listed Kangaroo Rat Transect Surveys, Trapping, and Relocation

The Project area is inside the range of the giant kangaroo rat and Tipton kangaroo rat and potentially suitable habitat occurs within the Project area. Transect surveys within suitable habitat shall be conducted prior to acceptance of final design to detect any potential sign of kangaroo rat activity in the Project area (such as tail drags, prints, scat, hay stacks, or precincts). If kangaroo rat signs are detected, focused surveys for the giant kangaroo rat and Tipton kangaroo rat, consisting of a trapping study, shall be conducted per the *Survey Protocol for Determining Presence of San Joaquin Kangaroo Rats* (USFWS, 2013c) to verify presence of the species. If the presence of either special status species is confirmed, individuals shall be relocated prior to project implementation. Prior to performing the relocation effort, Semitropic shall submit a Special Status Small Mammal Mortality Reduction and Relocation Plan (Relocation Plan) to CDFW prior to performing the relocation effort. Relocation activities shall not proceed until the Relocation Plan has been approved in writing by CDFW's regional representative. The Relocation Plan shall include, but not be limited to, trapping methodology; timing,

release location(s); release methods (i.e., soft release, hard release, or some other method); and identification of a wildlife rehabilitation center or veterinary facility for injured animals. If surveys confirm the presence of giant kangaroo rat and/or Tipton kangaroo rat, Semitropic would include the species in the Incidental Take Permit and a Biological Opinion or Habitat Conservation Plan permit.

Mitigation Timing: Semitropic shall retain a qualified biologist to conduct surveys for giant kangaroo rat and Tipton kangaroo rat to determine presence prior to acceptance of final design. If surveys confirm presence of the species, individuals identified in areas of the Project area where ground disturbance would occur shall be relocated in accordance to the Relocation Plan within three months prior to initial ground disturbance. If presence of the species on the Project area is confirmed, Semitropic would ensure that an Incidental Take Permit covering this species has been issued by CDFW (CESA/California Fish and Game Code Sections 2081(b) and 2081(c)) and a Biological Opinion (FESA Section 7) or Habitat Conservation Plan has been issued by the USFWS. During operations, Semitropic would ensure appropriate measures are implemented in accordance with the Biological Opinion (BO) or Habitat Conservation Plan issued by the USFWS and/or the ITP issued by CDFW.

Monitoring: Semitropic shall review and approve the reports associated with the transect survey, trapping study, and relocation efforts.

Mitigation Measure BIO-10: Nelson's Antelope Squirrel Preconstruction Surveys

Preconstruction surveys for Nelson's antelope squirrel shall be conducted where suitable habitat is present by a qualified biologist not more than 48 hours prior to the start of construction activities, maintenance activities or flooding of reservoirs. The survey area should include the proposed disturbance area plus a 100-foot buffer. If Nelson's antelope squirrel is discovered, Semitropic shall trap and relocate all individuals within the proposed disturbed area plus a 100-foot buffer in accordance with the Projects Relocation Plan described in BIO-9. If surveys confirm the presence of Nelson's antelope squirrel, Semitropic would include the species in the Incidental Take Permit.

Mitigation Timing: Semitropic shall retain a qualified biologist to conduct preconstruction surveys prior to construction, maintenance and flooding of reservoirs. Relocation of any observed individuals must be performed within three months prior to construction, maintenance and flooding of reservoirs. If presence of the species on the Project area is confirmed, Semitropic would ensure that an Incidental Take Permit covering this species has been issued by CDFW (CESA/California Fish and Game Code Sections 2081(b) and 2081(c)). During operations, Semitropic would ensure appropriate measures are implemented in accordance with the ITP issued by CDFW.

Monitoring: Semitropic shall review and approve the reports associated with the preconstruction survey and ensure and verify that avoidance is achieved and individuals are relocated in accordance with the Relocation Plan.

Mitigation Measure BIO-11 - Blunt-nosed Leopard Lizard Protocol Surveys

Prior to acceptance of final design of the Project, protocol-level surveys for the blunt-nosed leopard lizard shall be conducted where disturbance areas are located within suitable habitat. The survey shall consist of transect surveys following the *Approved Survey Methodology for the Blunt-Nosed Leopard Lizard* (CDFW 2004) or the current protocol established by the USFWS and CDFW at the time surveys are conducted. Due to the species' fully protected status, if blunt-nosed leopard lizards are detected, an avoidance and/or a conservation plan will be developed in coordination with the CDFW to avoid take which would partly require redesigning the Project in order to fully avoid occupied habitat.

Plan Requirements and Timing. A qualified biologist(s) shall submit the results of the protocol surveys to Semitropic prior to acceptance of final design.

Monitoring. Semitropic shall ensure that documentation is received prior to acceptance of final design plans and shall oversee implementation of avoidance plans.

Mitigation Measure BIO-12: Preconstruction Surveys for Burrowing Owl

No more than 30 days before the start of initial ground disturbing activities, a qualified biologist(s) shall conduct focused, preconstruction, take-avoidance surveys for burrowing owls within all areas proposed for ground disturbance that contain suitable owl habitat (CDFG, 2012). Preconstruction surveys shall be consistent with CDFW-recommended methods described in the *Staff Report on Burrowing Owl Mitigation* (CDFG, 2012; Appendix B), and be conducted on foot such that 100% of the survey area is visible, and shall cover the entire limits of disturbances plus a 500-foot buffer. If the Project is developed in phases, the preconstruction surveys shall be timed to coincide with the start of each phase, rather than the entire site being surveyed at one time. All observations of burrowing owl and sign of burrowing owl (including suitable burrows, pellets, whitewash) shall be mapped on a site-specific aerial image. A report of the survey finds shall be submitted to Semitropic prior to initiation of construction activities.

If suitable burrows for burrowing owls are identified during preconstruction surveys, mitigation measure BIO-13 shall be implemented.

Mitigation Timing: Semitropic would contract for preconstruction burrowing owl surveys to be conducted prior to construction of the Project and shall document surveys have been completed prior to the start of initial ground-disturbing activities.

Monitoring: Semitropic shall document compliance with all burrowing owl impact avoidance and minimization measures.

Mitigation Measure BIO-13: Burrowing Owl Avoidance and Minimization Measures

If no suitable burrows are found, a final take avoidance survey must be completed within 48 hours prior to initiation of ground disturbing activities. If suitable burrows for burrowing owls are found during preconstruction surveys on the Project area; burrowing owl occupancy shall be determined through up to three additional focused surveys on potential burrows during the morning and/or evening survey windows as defined in the *Staff Report on Burrowing Owl Mitigation* (CDFG, 2012; Appendix B). If the burrows are determined to be unoccupied, they shall be hand excavated by a qualified biologist.

If the presence of burrowing owls is confirmed, the following avoidance measures shall be implemented.

1. Occupied burrows shall not be disturbed during the nesting season (February 1 through August 31) unless a qualified biologist verifies, through noninvasive methods, that either (1) the burrow is not being used for breeding, (2) a previously active nest has failed and the burrow is no longer active, or (3) all juveniles from the occupied burrow are foraging independently and capable of independent survival and the burrow is no longer an active nest burrow. Owls present after February 1st shall be assumed to be nesting unless evidence indicates otherwise. Nest-protection buffers described below shall remain in effect until August 31st or, based upon monitoring evidence, until the nest has failed or all juvenile owls are foraging independently as determined by a qualified biologist.
2. Site-specific, no-disturbance buffer zones shall be established and maintained between Project activities and occupied burrows using the distances recommended in the CDFW guidelines (CDFG, 2012; Appendix B):

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

The appropriateness of using reduced buffer distances or burrow-specific buffer distances shall be established on a case-by-case basis by a qualified biologist in consultation with CDFW, and shall depend on existing conditions (e.g., vegetation/topographic screening and current disturbance regimes). If necessary, buffer distances shall be carefully reassessed and relaxed or modified based on future development plans (e.g., increased or intensified construction activities) by a qualified biologist who may consult with CDFW. The buffer zones shall be clearly delineated by highly visible orange construction fencing, which shall be maintained in good condition through construction of Project or until construction activities are no longer occurring in the vicinity of the burrow.

3. During the nonbreeding season (generally September 1 through January 31), a qualified biologist may passively relocate burrowing owls found within construction areas. Prior to passively relocating burrowing owls, a Burrowing Owl Exclusion Plan shall be prepared by a qualified biologist in accordance with Appendix E of the *Staff Report on Burrowing Owl Mitigation* (CDFG, 2012). The Burrowing Owl Exclusion Plan shall be submitted for review and approval to the CDFW and District prior to implementation.

   The biologist shall accomplish such relocations using one-way burrow doors installed and left in place for at least two nights; owls exiting their burrows will not be able to re-enter. Then, immediately before the start of construction activities, the biologists shall remove all doors and excavate the burrows to ensure that no animals are present in the burrow. The excavated burrows shall then be backfilled. To prevent evicted owls from occupying other burrows in the impact area, the biologist shall, before eviction occurs, (1) install one-way doors and backfill all potentially suitable burrows within the impact area, and (2) install one-way doors in all suitable burrows located within approximately 50 feet of the active burrow, then remove them once the displaced owls have settled elsewhere. When temporary or permanent burrow-exclusion methods are implemented, the following steps shall be taken:

   a) Prior to excavation, a qualified biologist shall verify that evicted owls have access to multiple, unoccupied, alternative burrows, located nearby (within 250 feet) and outside of the projected disturbance zone. If no suitable alternative natural burrows are available for the owls, then, for each owl that is evicted, at least two artificial burrows shall be installed in suitable nearby habitat areas. Installation of any required artificial burrows preferably shall occur at least two to three weeks before the relevant evictions occur, to give the owls time to become familiar with the new burrow locations before being evicted. The artificial burrow design and installation shall be as described in the Example Components for Burrowing Owl Artificial Burrow and Exclusion Plans per Appendix E of the *Staff Report on Burrowing Owl Mitigation* (CDFG, 2012).

   b) Passive relocation of burrowing owls shall be limited in areas adjacent to Project activities that have a sustained or low-level disturbance regime; this approach shall allow burrowing owls that are tolerant of Project activities to occupy quality, suitable nesting and refuge burrows. The use of passive relocation techniques in a given area shall be determined by a qualified

biologist who may consult with CDFW, and shall depend on existing and future conditions (e.g., time of year, vegetation/topographic screening, and disturbance regimes).

Mitigation Timing: Within 30 days prior to initial ground disturbance, Semitropic's biologist shall confirm that either no occupied burrowing owl burrows were recorded on the Project area, or that appropriate avoidance measures have been implemented to ensure avoidance of active breeding burrows.

Monitoring: Semitropic shall ensure the project is in compliance with burrowing owl avoidance and minimization measures.

Mitigation Measure BIO-14 - Compensatory Habitat Mitigation for Burrowing Owl

To mitigate for the loss of burrowing owl habitat from the construction of all new facilities, Semitropic shall provide compensatory mitigation acreage, adjusted to reflect the final Project footprint in consultation with CDFW, but at a minimum of 1:1 ratio (preserved habitat:affected habitat). The compensatory mitigation may be in the form of a mitigation bank or establishment of a conservation easement and must provide equal or greater habitat value than the Project area.

Compensatory mitigation areas for burrowing owl can be combined with mitigation for multiple species as outlined in measure BIO-1 for nested mitigation. Compensatory mitigation for burrowing owl shall be consistent with the conditions outlined in measure BIO-1, and managed and monitored under the HMMP as outlined in measure BIO-2.

Mitigation Timing: Identification of the total acreage for mitigation of burrowing owl must be calculated prior to start of construction, including grading. All other timing shall be consistent with measure BIO-1.

Monitoring: Semitropic shall ensure the compensatory mitigation has been completed and the conservation easement recorded in accordance with the requirements of BIO-1.

Mitigation Measure BIO-15 - American Badger Avoidance and Minimization Measures

A minimum of two weeks prior to initiation of ground disturbing activities during construction, a survey for badger burrows shall be conducted within the disturbance footprint by a qualified biologist (a biologist familiar with, including identification of, the wildlife species in the region). Dens found within the survey area shall be mapped and monitored using a tracking medium, remote camera system, and/or spotlighting at night for a minimum of three days to assess the presence of badgers. Inactive dens shall be collapsed by hand with a shovel to prevent badgers from re-using them during construction. Active dens located within the survey area shall be avoided during the breeding season (March 1 through June 30). A minimum buffer of 50 feet around the active den within the Project area shall be demarcated by construction fencing. The fencing shall be installed one foot above ground to permit movement of badgers in and out of the buffer zone. Once the biologist has determined that active dens are no longer in use, the den shall be collapsed by shovel. Prior to grading activities occurring outside of the breeding season, badgers may be discouraged from using currently active dens by partially blocking the entrance of the den with sticks, debris, and soil for three (3) to five (5) days. Access to the den would be incrementally blocked to a greater degree over this period. This would cause the badger to abandon the den site and move elsewhere. After badgers have stopped using active dens within the Project area, the dens would be collapsed by hand with a shovel.

Mitigation Timing. The name, qualifications, scope, and contact information for the surveying biologist must be submitted to Semitropic in advance of the surveys. A report of the results of the badger survey shall be submitted to Semitropic for review and approval prior to initiation of ground-disturbing activities.

Monitoring. Semitropic would review and approve the reports. A qualified biologist shall be present during the initial ground-disturbing activity

Mitigation Measure BIO-16 - Western Spadefoot, Northern Western Pond Turtle, San Joaquin coachwhip and Tulare Grasshopper Mouse Preconstruction Survey

Not more than two weeks prior to initiation of ground disturbing activities, a qualified biologist shall conduct a preconstruction survey for western spadefoot, northern western pond turtle, San Joaquin coachwhip and Tulare grasshopper mouse. The survey area should include the Project area and all proposed ingress/egress routes, plus a 100-foot buffer.

If these species are found and individuals are likely to be killed or injured by construction activities, a qualified biologist shall be allowed sufficient time to capture and relocate the animals from the Project area before construction activities begin. The qualified biologist shall relocate individuals the shortest distance possible to a location that contains suitable habitat not likely to be affected by activities associated with the proposed Project. The biologist(s) should maintain sufficiently detailed records of any individual observed, captured, relocated, etc., including size, coloration, any distinguishing features and photographs (preferably digital) to assist him or her in determining whether translocated animals are returning to the Project area.

To ensure that diseases are not conveyed between work sites by the qualified biologist, the fieldwork code of practice developed by the Declining Amphibian Populations Task Force should be followed at all times.

Timing. The name, qualifications, scope, and contact information for the surveying biologist must be submitted to Semitropic in advance of the surveys. Proposed relocation areas shall be identified and approved by Semitropic prior to beginning the work. A report of the results of the capture and relocation efforts shall be submitted to Semitropic for review prior to initiation of ground-disturbing activities.

Monitoring. Semitropic shall review the reports for compliance and shall inspect the site during construction to ensure compliance.

Mitigation Measure BIO-17 - Species of Special Concern Avoidance and Minimization

If possible, schedule construction activities within suitable habitat outside of the typical nesting season for northern western pond turtle (April-August; Stebbins, 2003). If work is conducted within the nesting period and a northern western pond turtle egg clutch is discovered during preconstruction surveys, the location shall be surrounded with high visibility fencing under the guidance of a qualified biologist. The nest shall be avoided by construction activities until a qualified biologist determines that the clutch has hatched. The CDFW shall also be contacted to provide additional guidance in the event that a northern western pond turtle nest is discovered to determine an appropriate relocation site. If, during construction, a northern western pond turtle nest is discovered, construction shall cease immediately upon the discovery and the qualified biologist shall be notified. The same procedure described above shall then be applied. To prevent impacts during the operation phase on northern western pond turtle nests, during the years when the Kettleman Reservoir is filled, inundation of the reservoir shall occur prior to April 1, the typical start of the nesting season.

A qualified biologist shall be present during all initial ground disturbing activities (including vegetation removal) associated with construction of the Project, to recover SSC (western spadefoot, northern western pond turtle, San Joaquin coachwhip, and Tulare grasshopper mouse) that may be unearthed by construction activities. Individuals that are unearthed during excavation, if in good health, shall be immediately relocated to a designated relocation area to be determined by a qualified biologist in coordination with CDFW. Individuals shall be relocated the shortest distance possible to a location that contains suitable habitat not likely to be affected by activities associated with the proposed Project. The biologist(s) should maintain sufficiently detailed records of any individual observed, captured,

relocated, etc., including size, coloration, any distinguishing features and photographs (preferably digital) to assist him or her in determining whether translocated animals are returning to the Project area. If injured, the animals shall be turned over to a CDFW-approved specialist until they are in a condition suitable for release into the designated release area, or deposited at an approved vertebrate museum.

Mitigation Timing. Preconstruction surveys shall be conducted within 30 days prior to initial ground disturbance associated with construction and the protective measures identified in BIO-17 shall be implemented.

Monitoring. Semitropic shall maintain a qualified biologist to monitor compliance with the above avoidance and minimization measures.

Mitigation Measure BIO-18 - Preconstruction Surveys for Raptors and Other Special Status Bird Species.

Not more than 30 days prior to initiation of construction activities (including mobilization, staging and ESA fence installation) during the breeding season (February 1 to August 31), a qualified biologist shall conduct preconstruction surveys for nesting raptors. Not more than 14 days prior to initiation of construction activities (including mobilization, staging and ESA fence installation) during the breeding season (February 1 to August 31), a qualified biologist shall conduct preconstruction surveys for nesting MBTA/state-regulated birds. The survey for the presence of nesting raptors, including Swainson's hawk, white tailed kite, and northern harrier, shall cover all areas within the disturbance footprint plus a 1-mile buffer where access can be secured. The survey area for all other nesting bird species shall include the disturbance footprint plus a 300-foot buffer. The surveys shall be repeated during the breeding season for each subsequent year of construction to ensure that ongoing construction activities avoid impacts to nesting birds. If construction is phased, surveys shall be phased appropriately.

If active nests (nests with eggs or chicks) are located, the qualified biologist shall establish an appropriate avoidance buffer ranging from 50 to 300 feet based on the species biology and the current and anticipated disturbance levels occurring in vicinity of the nest, and 0.5 mile for fully protected and state-listed raptors (such as white-tailed kite and Swainson's hawk). The objective of the buffer shall be to reduce disturbance of nesting birds. All buffers shall be marked using high-visibility flagging or fencing, and, unless approved by the qualified biologist, no construction activities shall be allowed within the buffers until the young have fledged from the nest or the nest fails.

Mitigation Timing: Semitropic shall engage a qualified biologist to complete the survey(s) and document that either no raptors or other special status birds were recorded on the Project area, or that appropriate avoidance measures have been implemented to ensure avoidance of impacts to raptors and other special status birds prior to the start of construction activity. If the preconstruction surveys for raptors or other special status birds identify any state listed or state fully protected species, a preconstruction survey report would also be provided to CDFW prior to the start of construction.

Monitoring: Semitropic shall ensure compliance with raptor and special status bird avoidance and minimization measures.

Mitigation Measure BIO-19 – Avian Botulism Impact Avoidance and Minimization

The following avoidance and minimization measure shall be implemented during the operational phases of the Project to protect waterbird species from impacts due to Project implementation.

Prevent the Accumulation of Energy Source. To reduce organic inputs that result in an energy source for *Clostridium botulinum*, eliminate factors that introduce large amounts of decaying matter. When the Kettleman Reservoir is inundated with water during the late spring and early fall, remove organic

matter from the flooded reservoir, including floating algal mats, decaying vegetation, and dead avian species or other animals.

Prevent Gradual Rise in Water Depth**.** If possible, use canals and channels to deliver water in a focused manner throughout the reservoir rather than allowing the reservoir to fill gradually.

Take Action Immediately During Outbreaks. Immediately after an outbreak is observed, dispose of vertebrate carcasses through burial or burning to remove substrates for toxin production. If an outbreak occurs, document environmental conditions, including the water temperature, depth, dissolved oxygen level, and pH level; itemize the quantities of energy sources including vegetative biomass, primary plant species, and the number of carcasses by species; and record dates of the outbreak. If recurrent outbreaks occur in particular areas, modify the habitat to reduce bird use in the area and/or modify Project operations.

Mitigation Timing: Semitropic shall conduct and document that the Kettleman Reservoir is inspected every two weeks (at minimum) during inundation events to ensure the reservoir is free of accumulated energy sources.

Monitoring: Semitropic shall ensure that all avian botulism impact avoidance and minimization requirements are implemented.

Mitigation Measure BIO-20 - Special Status Bird Species Impact Avoidance and Minimization
The following avoidance and minimization measure shall be implemented during the construction and operation phases to protect special status bird species from impacts due to Project implementation.

Cap Vertical Pipes and Piles**.** To prevent cavity-dwelling and -nesting birds from entering open vertical pipes and piles, all open vertical pipes and piles shall be capped or otherwise modified to prevent use by birds. Caps or other modifications shall be put in place before or immediately after pipe or pile installation. All caps or other exclusionary modifications shall be maintained for the duration of construction and operation. A qualified biologist shall periodically monitor the site to ensure that all pipes or piles are appropriately capped.

Avoid Nesting Season for Maintenance. To the extent feasible, nesting season shall be avoided for vegetation maintenance activities. If nesting season cannot be fully avoided, surveys shall be completed prior to ground- or vegetation-disturbing maintenance activities, and appropriate nest avoidance buffers shall be established as identified previously in measure BIO-19.

Mitigation Timing: Semitropic shall document that avian impact avoidance and minimization features have been incorporated into the Project design prior to construction, and shall implement operations phase avoidance measures prior to each maintenance activity that disturbs the ground or requires vegetation removal.

Monitoring: Semitropic shall ensure that all avian impact avoidance and minimization design features are implemented.

Mitigation Measure BIO-21 - Special Status Animal Species General Avoidance Measures and Best Management Practices.
The following general avoidance measures and BMPs shall be implemented during the construction phase and operation phase involving ground disturbance to avoid and minimize impacts to special status animal species.

1. Prior to ground disturbance, all permanent and temporary disturbance areas shall be clearly delineated by stakes, flags, or another clearly identifiable system.

2. To minimize disturbance of areas outside the Project area, all construction and operation vehicle traffic shall be restricted to established roads, construction areas, and other designated areas. These areas shall be included in preconstruction surveys and, to the extent possible, shall be established in locations disturbed by previous activities to prevent further impacts.
3. Construction and operation and maintenance vehicles shall observe a 20 miles-per-hour (mph) speed limit during daylight hours within Project areas, except on county roads and state and federal highways.
4. All construction pipes, culverts, or similar structures greater than four inches in diameter, or greater than 1.5 inches in diameter, stored or stacked on the Project area for one or more overnight periods, shall be either securely capped before storage or thoroughly inspected for wildlife before the pipe is subsequently moved, buried, capped, or otherwise used.
5. If encountered, wildlife within the Project area shall be allowed to escape unimpeded, removed by a qualified biologist and placed in a designated safe area away from construction activities, or left in place when required by regulations, policies, permits, and/or conditions of approval. If wildlife removal by a qualified biologist is required, the qualified biologist shall be approved or permitted by CDFW and USFWS, as and if required by law, prior to removing such species.
6. To prevent entrapment of special status wildlife, all excavations (e.g., steep-walled holes, or trenches) more than 12 inches deep shall be covered with plywood or similar materials when not in use or fitted with at least one escape ramp constructed of earth dirt fill, wooden planks, or another material that wildlife could ascend. All excavations more than 12 inches deep shall be inspected daily for entrapped wildlife before construction activities begin and once immediately before being covered with plywood. Before excavations are filled, they shall be thoroughly inspected for entrapped wildlife. Any wildlife discovered shall be allowed to escape unimpeded before field activities resume or shall be removed from excavated areas by a qualified biologist and released at a safe nearby location.
7. Avoidance and minimization of impacts on sensitive biological resources within active construction areas shall be aided through identification of ESAs with flagging or fencing.
8. Dust suppression shall occur during construction activities, when necessary, to meet air quality standards and protect biological resources.
9. Disturbance of riparian areas along South Fork of the Kings River and South Fork Canal shall be avoided to the extent practicable.
10. No vehicles or equipment shall be refueled or undergo maintenance within 50 feet of a waterway. Spill kits shall be maintained on the site in sufficient quantity to accommodate at least three complete vehicle tank failures of 50 gallons each. Any vehicles driven or operated within or adjacent to waterways shall be checked and maintained daily to prevent leaks of materials.
11. All general trash, food-related trash items (wrappers, cans, bottles, food scraps, cigarettes, etc.), microtrash (nails, bits of metal and plastic, small construction debris, etc.), and other human-generated debris scheduled to be removed shall be stored in animal-proof containers and removed from the site on a regular basis (weekly during construction, and at least monthly during operations). No deliberate feeding of wildlife or domestic animals shall be allowed.
12. New light sources shall be minimized, and lighting shall be designed (e.g., using shielding and/or downcast lights) to limit the lighted area to the minimum necessary.

13. Use of chemicals, fuels, lubricants, or biocides shall be in compliance with all local, state, and federal regulations. All uses of such compounds shall observe label and other restrictions mandated by the U.S. Environmental Protection Agency, California Department of Food and Agriculture, and other state and federal legislation. Use of first- and second-generation rodenticides shall not be permitted except for the limited use of zinc phosphide, or a rodenticide approved by Semitropic, and only after other means of pest control (e.g. rodent traps) have proven to be ineffective.
14. To prevent harassment and mortality of listed, special status, and common wildlife species and destruction of their habitats, no domesticated pet animals shall be permitted on the Project area. Livestock and trained working animals used specifically for livestock management or species surveys (e.g., horses, livestock working dogs, scent tracking dogs) are allowed.
15. No firearms shall be allowed on the Project area, unless otherwise approved for security personnel.

Mitigation Timing: Semitropic shall ensure these practices are followed during construction and during ground disturbing operations activities.

Monitoring: Semitropic shall ensure compliance with special status animal species general avoidance measures and construction BMPs.

Mitigation Measure BIO-22 - Worker Environmental Awareness Program.
Semitropic shall retain qualified biologists to prepare a Worker Environmental Awareness Program (WEAP) that shall be presented to all construction personnel and employees before they are allowed to work on the Project area during construction. This presentation shall explain to construction personnel how best to avoid the accidental take of listed and impacts to other special status species during construction. The program shall consist of a brief presentation explaining listed and other special status species concerns to all personnel involved in the Project. The program shall include a description of special status species potentially on the Project area and their habitat needs; an explanation of the status of the species and their protection under the FESA, CESA, Bald and Golden Eagle Protection Act, Migratory Bird Treaty Act, and California Fish and Game Code; specific mitigation measures applicable to listed and other special status species; and the penalties for take.

The program shall also explain to construction personnel how to avoid unnecessary impacts to waterways. The program shall include a description of jurisdictional waters on the site, specifically permitted impacts to jurisdictional waters, and maps showing the location of jurisdictional waters and permitted impacts. The program shall be recorded electronically, and all future facility employees shall be required to review the recording before the initiation of work on the Project area.

The WEAP shall be implemented by Semitropic before the start of ground disturbance and shall continue through the construction phase for all construction personnel. A separate WEAP shall be implemented by Semitropic before Project operation for all permanent Project employees. This program shall include all the information above, as applicable to Project operations.

Mitigation Timing: The WEAP shall be approved by Semitropic prior to start of construction, and all staff must complete WEAP training prior to conducting any work on the Project area.

Monitoring: Semitropic shall ensure that all components of the WEAP training are fully implemented by Semitropic.

Significance Determination after Mitigation

With implementation of the above mitigation measures, potential impacts to special status plant and animal species would be reduced to a less than significant level.

Impact BIO-2 Implementation of the proposed Project could have a substantial adverse effect on 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.

Direct Impacts

Construction

All Facilities

The Project would require improvements to a number of existing aquatic resources, as described in detail in Chapter 2 (Project Description), and would divert unallocated floodwater in some situations, as outlined in Chapter 2 (Project Description), from the Kings River watershed. The improvements proposed include modifications to the weir at Empire Weir No. 2, potential improvements to South Fork Canal that receives water at this weir to connect new conveyance structures to the existing canals, and improvements to the California Aqueduct to convey water to and from the storage system and the California Aqueduct. Pump stations are anticipated along major conveyances to aide in maintaining target flows, and may require alteration of channel banks at these locations.

The Project would result in temporary and permanent impacts to localized sites for improvement of weirs and connections to existing conveyance channels, and for construction of inlet and outlet structures. Small areas of riparian woodland persist in the vicinity of Empire Weir No. 2, thus, improvements to Empire Weir No. 2 could result in removal of riparian vegetation. Temporary access points are anticipated to result in additional temporary impacts to aquatic resources. Temporary impacts to aquatic resources would occur to allow construction access for improvements to existing weirs, modification of existing canals, and construction of interties. The majority of temporary impacts would be along highly managed canals and other existing managed channels, though some temporary impacts would occur along the South Fork of the Kings River at Empire Weir No. 2. Temporary impacts would be related to grading of riparian banks, construction access, dewatering (if needed) in perennial canals, and possible construction of temporary road crossings. Additional temporary impacts may occur to support installation of utilities to support pumping facilities.

The existing major canals, South Fork Canal, Blakeley Canal, and the unnamed canals at Quebec and Racine Avenues, would be retained. Some of the larger ditches that crisscross the Project area would be retained and used to move water throughout the storage portion of the Project. However, to convey the proposed volume of flow, some of the existing channels would require vegetation maintenance and may require increased channel depth.

In addition, construction of the storage cells in the proposed Kettleman Reservoir would require converting some of the existing ditches and drains to a basin format. Levee construction would result in placement of fill in some of the existing smaller irrigation and drainage channels that cross the Project area that were constructed to convey irrigation water to fields. Construction of storage cells would also result in removal of willows and tamarisk around the constructed basin feature north of Racine Avenue. New culverts may be required to support access roads. This would result in conversion of ditch features and a smaller basin, which are used when irrigation is occurring, into larger shallow basins that would hold water periodically in wet years. It is expected that hydrophytes will recruit into basin areas when water is present; the duration for which these plants would persist would depend on availability of water from year to year.

The Project would also construct the Kettleman Canal, a new water conveyance channel within the Kettleman Reservoir, adding additional managed aquatic resources to the Project area. Additionally, the proposed use of the Project area would result in a net increase in surface waters in at least some years.

Operations and Maintenance

All Facilities

Aquatic resources in the Project area are highly modified, and the majority of features are managed routinely to control capacity, vegetation growth, and maintain existing culverts, gates, and crossing structures. Periodic maintenance of canals and storage cells is expected to result in periodic removal of hydrophytes that recruit into these features and removal of sediment accumulation.

Indirect Impacts

Construction, Operations, and Maintenance

All Facilities

Work within canals and other channels both during construction and operations and maintenance phases of the Project could contribute to the spread of invasive wetland vegetation, disease, or wildlife (e.g., tamarisk) to other aquatic systems in or downstream of the Project area, if not prevented.

Significance Determination before Mitigation

The majority of the existing canals and channels are constructed features that cross what was once a large freshwater lake. These features are routinely managed but do provide a source of water for wildlife, some riparian habitat, and support a variety of hydrophytic plants that provide habitat when maintenance cycles allow vegetation to recruit. Permanent impacts to the South Fork Canal, Blakeley Canal, and other unnamed canals and channels would be significant because these features provide water sources and shelter for wildlife when vegetation has been allowed to recruit to these features and has not yet been managed in a given year, partially offsetting habitat lost through conversion of natural waters in the vicinity to managed systems. These impacts are partially offset through creation of new canals and increased areal extent of surface water in some years post-Project and anticipated recruitment of native hydrophytic vegetation along margins of these systems. Some of the existing aquatic resources, including riparian canopy near Empire Weir No. 2, are under the jurisdiction of regulatory agencies and potentially subject to no net loss policies. Therefore, this impact would be *significant but mitigatable (Class II)*.

Mitigation Measures

Mitigation Measure BIO-23 - Work Area Delineation

To minimize extent of impacts to major named features in the Project area, work areas in the vicinity of the South Fork of the Kings River, South Fork Canal, and Blakeley Canal shall be minimized to the minimum area necessary to construct proposed improvements. To the extent feasible, riparian vegetation associated with these features shall be avoided. Avoidance fencing for preserved riparian vegetation shall be placed at the outer dripline of the riparian canopy. All work that must occur within riparian setbacks shall be monitored by a qualified biologist to ensure direct impacts to riparian habitat are minimized, and all impacts to special status species are avoided. Riparian setbacks and all native riparian habitat to be avoided by the Project shall be fenced or flagged before construction occurs in adjacent areas. A biological monitor shall be present during initial work to ensure compliance with off-limits areas.

Mitigation Timing: Semitropic shall submit documentation that appropriate avoidance measures have been implemented to ensure avoidance of all riparian habitat and work site minimization in the vicinity of named canals prior to initiation of construction.

Monitoring: Semitropic shall ensure compliance with riparian habitat impact avoidance and minimization measures.

Mitigation Measure BIO-24 - Riparian and Aquatic Resource Mitigation
Where permanent impacts result in removal of native riparian vegetation, permanent impacts shall be mitigated at a 1:1 ratio (acreage of riparian corridor preserved and enhanced: acreage of riparian corridor impacted) and shall include replacement plantings to offset loss of native riparian trees and shrubs from the Project area. Removal of nonnative riparian vegetation would not require mitigation. Temporary impacts to native riparian vegetation shall be restored in place at a 1:1 ratio (linear feet restored: linear feet impacted). The design, monitoring schedule, and success criteria for mitigation planting shall be described in a Project Aquatic Resource Mitigation and Monitoring Plan (described in detail in mitigation measure BIO-25, below) that demonstrates no net loss in acreage or function.

Offsite mitigation or purchase of credits from an approved mitigation bank are acceptable options to meet this requirement. Where mitigation is accomplished through preservation, restoration, and enhancement, preserved riparian corridors and any surrounding uplands above the top of bank within the area to be preserved shall be placed in a conservation easement or similar legal mechanism and managed in perpetuity. Mitigation can be accomplished in conjunction with compensatory mitigation for loss of habitat described under measure BIO-25. A CDFW Streambed Alteration Agreement (SAA) would be required for activities affecting the bed, bank and riparian areas associated with the South Fork of the Kings River at Empire Weir No. 2, and potentially other canals. This SAA may include additional requirements beyond those required here.

Mitigation Timing: Semitropic shall identify the location of mitigation lands, the holder of conservation easements, and the restrictions contained in the easement(s) created for the permanent protection of these lands consistent with the timing outlined in mitigation measure BIO-1.

Monitoring: Monitoring for riparian and aquatic resource mitigation shall be consistent with the monitoring conditions outlined in mitigation measure BIO-25.

Tamarisk control shall be implemented as outlined in measure BIO-6, Invasive Species Management Plan.

Significance Determination after Mitigation

With implementation of the above mitigation measures, potential impacts to riparian habitat and aquatic resources regulated by CDFW would be reduced to a less than significant level.

Impact BIO-3 Implementation of the proposed Project could 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.

Direct Impacts

Construction, Operations, and Maintenance

All Facilities

Construction of the Aqueduct Intertie could also impact seasonal wetlands that have developed in the bottom of the northern basin of Blakeley Reservoir, depending on Intertie alignment. As noted under Impact BIO-2, the Project would also impact potential other waters of the U.S. to improve South Fork Canal at Empire Weir No. 2 to allow construction access for improvements to existing weirs, and to modify existing canals and construct interties. These activities are anticipated to require dredging to deepen channels, and fill to connect new conveyance canals to existing canals. The existing major canals, the South Fork Canal, Blakeley Canal, and the unnamed canals at Quebec and Racine Avenues, would be retained. Some of the larger ditches that crisscross the Project area would be retained and used to move water throughout the

storage portion of the Project. However, to convey the proposed volume of flow, some of the existing channels would require vegetation maintenance, and may require increased channel depth.

In addition, construction of the proposed Kettleman Reservoir storage cells would require converting some of the existing ditches and drains to a basin format. Levee construction and grading of storage cells would result in placement of fill in some of the existing smaller irrigation and drainage channels that cross the Project area that were constructed to convey irrigation water to fields.

As discussed previously, conversion of ditch features and a smaller basin, which are used when irrigation is occurring, into larger shallow basins (storage cells) that would hold water periodically in wet years is anticipated to result in a net increase in shallow surface water resources on the Project area in some years. It is expected that hydrophytes will recruit into basin areas when water is present; the duration for which these plants would persist would depend on availability of water from year to year and on maintenance cycles.

Indirect Impacts

Construction, Operations, and Maintenance

All Facilities

Work within canals and other channels both during construction and operations and maintenance phases of the Project could contribute to the spread of invasive wetland vegetation, disease, or wildlife (e.g., tamarisk) to other aquatic systems in or downstream of the Project area, if not prevented.

Significance Determination before Mitigation

Throughout California, the quality and quantity of wetland habitats has dramatically declined due to the construction of dams, dikes, and levees as well as due to water diversions, the filling of wetland habitat for development, and the overall degradation of general water quality due to inputs of runoff from agricultural, urban, and infrastructure development and other sources. Wetlands also present unique habitat functions and values for wildlife, and provide habitat for plant species adapted to wetland hydrology. As a result, wetland habitat types are considered sensitive habitats. Wetlands are also federally regulated under Section 404 of the Clean Water Act. Substantial adverse, permanent impacts, and temporary impacts lasting more than one rainy season, would be considered significant under CEQA. Therefore, this impact would be considered *significant but mitigatable (Class II)*.

The Project is anticipated to result in net increase in other waters of similar function and value as impacted features, thus additional mitigation for non-wetland waters is not prescribed.

Mitigation Measures

Mitigation Measure BIO-25 - Wetland Avoidance and Minimization

Impacts to wetlands shall be avoided to the extent feasible. General Project staging and laydown activities shall not occur within wetlands during construction. To avoid unnecessary egress into wetlands, all wetlands to be preserved in the Project area shall be clearly shown on Project plans and the limits marked with highly visible flagging, rope or similar materials in the field. Access allowed within these features for the purposes of construction in and near such features (e.g., road crossings, trenching) shall be clearly delimited on Project plan sets, and these allowed work limits shall also be staked in the field to prevent construction personnel from causing impacts to areas outside of work limits. Where necessary, silt fencing or other measures may be used to protect adjacent wetlands from sediment transport or other indirect impacts that could result from adjacent construction. During the operation of the facility, maintenance activities shall not be staged within wetlands. A biological monitor shall be present to ensure compliance with off-limits areas.

Mitigation Timing: Semitropic shall implement wetland avoidance and minimization measures prior to start of construction.

Monitoring: Semitropic shall ensure compliance with wetland impact avoidance and minimization measures.

Mitigation Measure BIO-26 - Wetland Habitat Mitigation

To compensate for permanent impacts to wetlands on site, offsite wetlands shall be created, preserved, restored or enhanced, and managed in perpetuity at a minimum 1:1 mitigation ratio (acres created and preserved: acres impacted), or alternatively credits may be purchased at an approved mitigation bank offering credits for wetland impacts in the Central Valley. Permanent loss includes all wetlands affected by permanent fill placement (which may occur, for example, from mass grading or new road or structure placement). Temporary impacts to wetlands shall be mitigated through onsite restoration or through 1:1 mitigation offsite. The permanent protection and management of the mitigation wetlands shall be ensured through an appropriate mechanism, such as a conservation easement granted to a public or private entity authorized by Section 815.3 of the California Civil Code to acquire and hold conservation easements, deed restriction, or fee title purchase. This mitigation can be accomplished in conjunction with compensatory mitigation for species impacts, as outlined in measure BIO-1, and this mitigation can occur offsite.

A Project-specific Aquatic Resource Mitigation and Monitoring Plan shall be prepared by a qualified restoration ecologist and shall include, at a minimum, the following information:

1. Wetlands and waters impacts summary and habitat mitigation actions;
2. Goals of the restoration to achieve no net loss;
3. A map depicting the location of the mitigation site(s) and a detailed description of existing site conditions;
4. A detailed description of the mitigation design, including:
    a. Location of the new wetlands;
    b. Proposed site construction schedule;
    c. Description of existing and proposed soils, hydrology, geomorphology, and geotechnical stability, as well as results of applicable soils testing conducted at the mitigation site;
    d. A detailed description of the steps required for site preparation and a conceptual grading plan—a formal package for plan sets, specifications, and estimates for the grading, and mitigation construction work shall be prepared based on the concepts set forth in the Aquatic Resource Mitigation and Monitoring Plan no fewer than fifteen days prior to starting work at the mitigation site;
    e. A description of recommended soil amendments and other site preparation;
    f. Development of a planting plan, including details on plant procurement, if necessary, propagation, allowable species for seeding and relative pounds/acre, and application;
    g. Maintenance plan for the created wetlands and riparian plantings;
    h. A description of specific monitoring metrics, and objective performance and success criteria, such as delineation of created area as jurisdictional wetland per USACE methods within five years of construction, minimum riparian tree and canopy cover measures in the enhanced stream reaches within 10 years of restoration, and others;

i. Monitoring methods for vegetation and soils, and measures stipulating quantitative monitoring to occur once per year for at least five years following construction of the wetlands or until success criteria are met;

j. A list of reporting requirements and reporting schedule; and

k. A contingency plan for mitigation elements that do not meet performance or final success criteria within five years for created wetlands and 10 years for riparian enhancement. This plan shall include specific triggers for remediation if performance criteria are not being met and a description of the process by which remediation of problems with the mitigation site (e.g., presence of noxious weeds) shall occur.

Alternatively, Semitropic shall purchase credits at an approved mitigation bank sufficient to offset temporary impacts to wetlands at a 1:1 ratio and permanent impacts to wetlands at a minimum 1:1 ratio.

Mitigation Timing: Semitropic shall determine and approve the location of mitigation lands, the holder of conservation easements, and the restrictions contained in the easement(s) created for the permanent protection of these lands. Documentation of recorded easement(s) shall be submitted to and approved by Semitropic consistent with the timing outlined in mitigation measure BIO-1. Alternatively, Semitropic shall finalize a purchase agreement for wetland and other aquatic resource credits at an approved bank prior to initiating construction that affects aquatic resources. Semitropic shall also consult with CDFW on the requirement for Lake and Streambed Alteration Agreement (Fish and Game Code Section 1600) for waters subject to CDFW jurisdiction; with USACE on requirements for a permit for waters subject to the Clean Water Act, and with the RWQCB on requirements for a 401 Certification and/or Waste Discharge Requirement prior to commencing Project activities.

Monitoring: Monitoring for wetland mitigation shall be consistent with the monitoring conditions outlined in BIO-1.

Significance Determination after Mitigation

With implementation of the above mitigation measures, potential impacts to wetlands would be reduced to a less than significant level.

Impact BIO-4 Implementation of the proposed Project could interfere substantially with the movement of 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.

Wildlife Movement

Large areas of contiguous undeveloped habitat surround the Project area. Development of the Project would prevent wildlife movement on up to approximately 16,700 gross acres because during non-surplus water years when the Kettleman Reservoir is not filled, the reservoir would still hold a sufficient water level, or a wildlife exclusion fence would be installed around the perimeter of the reservoir, to prevent occupation of the Kettleman Reservoir by special status species. The intent of continuously flooding the reservoir or constructing the wildlife exclusion fence is to prevent the potential take of special status species when the reservoir is filled. In addition, the California Aqueduct, which is an existing barrier to movement for most terrestrial species, is in close proximity and to the west of the Project area. Therefore, the proposed Project would impact wildlife movement beyond existing conditions; however, siting the project adjacent to an existing linear wildlife movement barrier (California Aqueduct) would reduce the overall impact to wildlife movement on a regional scale. In addition, inundation of the proposed reservoir would benefit migratory bird species by creating substantial stop over areas during their migrations.

Direct Impacts

Construction

All Facilities

Proposed improvements to the Empire Weir No. 2 would create construction-related disturbances, including activities and noise associated with earth moving, grading, vegetation removal, and installation of Project infrastructure, which could cause disruption of the northern rookery if it is still active when construction commences. Additionally, vegetation removal to improve capacity of existing channels, and placement of fill to construct levees could directly impact the southern rookery site.

Disruption from Project activities associated with weir improvements, vegetation management, and storage cell construction completed during the breeding season (typically February 1 through September 15) could result in nest abandonment or failure.

Operations and Maintenance

All Facilities

The CNDDB reports a black-crowned night heron rookery along Blakeley Canal in the northwestern portion of the Project area, and during field surveys, a second potential rookery was identified in a tamarisk stand near the Blakeley Canal near the southern edge of the Project area. Rookeries are native wildlife nest sites, and active heron nests are also protected.

Rookery sites could be affected by vegetation management activities and periodic maintenance in close proximity to the rookery. Operations activities associated with storage cells and support facilities near the rookeries completed during the breeding season (typically February 1 through September 15) could result in nest abandonment or failure.

Indirect Impacts

Construction, Operations, and Maintenance

All Facilities

Indirect impacts such as changes to habitat structure and increased human presence could result in abandonment of the rookery site(s). If the rookery site(s) are fully outside grading sites and new levees, construction-related disturbances, including activities and noise associated with earth moving, grading, vegetation removal, and installation of Project infrastructure, could cause indirect disruption of nests through increased noise and human activity.

Significance Determination before Mitigation

Due to the overall neutral to beneficial impacts on wildlife movement impacts to wildlife corridors would be *Less than significant (Class III).*

Project impacts to black-crowned night heron rookeries would be considered *significant but mitigatable (Class II).*

Mitigation Measure BIO-27 - Rookery Preconstruction Survey and Avoidance

To confirm location and extent of current heron rookeries, a qualified biologist shall conduct a survey of during breeding season of potential rookery sites and a 500-foot buffer within the Project area. No construction activities shall occur within 500 feet of the rookery during breeding season (February 1 to August 31). Vegetation maintenance within 500 feet of the rookery shall not occur during breeding season.

To the extent feasible, trees and shrubs that form the rookery shall be left intact and the rookery preserved. Vegetation that forms the rookery shall be excluded from invasive species management activities and avoided during channel maintenance.

If current rookeries cannot be fully avoided, removal of vegetation during construction or operation shall occur during the non-breeding season only, and shall be limited to the minimum necessary to achieve Project goals. If the rookery is fully removed, replacement habitat shall be created at a minimum 1:1 ratio (acre disturbed:acre created) offsite in conjunction with nested mitigation outlined under measure BIO-1 above.

Significance Determination after Mitigation

With implementation of the above mitigation measures, potential impacts to nursery sites would be reduced to a less than significant level. Impacts to wildlife movement corridors would be less than significant without mitigation.

Impact BIO-5 Implementation of the proposed Project would not conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

Construction, Operations, and Maintenance

All Facilities

The General Plan outlines Policies D1.1.1, D1.1.2, D2.1.1, D2.1.2, D2.1.3, D3.1.6 regarding Natural Plant and Animal Habitats. This EIR meets requirements for analysis of potential plant and wildlife habitats, wetlands, listed species, and wildlife movement corridors. With incorporation of mitigation measures BIO-1 through BIO-26 identified above, the Project would be consistent with these County policies.

The General Plan outlines Policies E1.1.1, E1.1.2, and E1.1.3 regarding threatened and endangered species. This EIR acknowledges the need to apply for permits and consult with CDFW, USFWS, USACE and RWQCB regarding some elements of the proposed Project, and fully analyzes potential effects to habitats that could be used by threatened and endangered species under Impact BIO-1. With incorporation of mitigation measures BIO-1 through BIO-26, identified above, the Project would be consistent with these County policies.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Cumulative Impacts

The geographic scope of potential cumulative impacts relating to biological resources encompasses the Project area and immediate vicinity. There are six relevant proposed projects proximate to the proposed Project that may contribute to cumulative impacts:

- Quay Valley Community Development - a new 7,175-acre community to be developed in south Kings County.
- Kettleman Hills Facility Expansion - expanding the existing B-18 Landfill and construct a new B-20 Landfill for hazardous waste and designated waste disposal.
- Kettleman City Surface Water Treatment Plant and Commercial Water Storage Tanks (Treatment Plant) – construction of a new surface water treatment plant to treat surface water for potable supply.

- Southwest Groundwater Banking Project – development of a project to divert and store floodwater from the Kings River and local storm water.
- JID Distributed Recharge Bypass and Lassen Projects – improvement to and construction of recharge facilities to divert and store floodwater from the Kings River.
- Terranova On-Farm Flood Capture and McMullin Recharge Site – improvements to and construction of facilities to divert floodwater from the Kings River for recharge on existing farm lands.

Of these projects, the first three listed above have the potential to cumulatively adversely affect biological resources by modifying habitats or interfering with species movement. The three other groundwater projects are located in Fresno County, outside the Tulare Lake bed area. Potential cumulative impacts related to biological resources are, however, generally site-specific and depend on Project-specific conditions. Biological-related impacts resulting from construction and/or operation of these related projects are expected to be similar to those anticipated for the proposed Project, and as such, there are no anticipated cumulative impacts associated with the proposed Project and the projects listed above assuming implementation of construction best management practices and use of similar mitigation measures at all sites. If implemented, the potential Southwest Groundwater Banking Project, the JID Distributed Recharge Bypass and Lassen Projects, and the Terranova On-Farm Flood Capture and McMullin Recharge Site project would add cumulative impacts to San Joaquin River fisheries. This cumulative impact will be evaluated as a part of the SWRCB water rights process.

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3.6 Cultural Resources

This section presents the physical and regulatory setting for cultural and tribal cultural resources at the Project area. The impact analysis considers the potential for the Project to impact cultural and paleontological resources and tribal cultural resources, and identifies mitigation measures. The impact analysis is supported by a Cultural Resources Study conducted for the Project area (Rincon, 2017).

3.6.1 Environmental Setting

The Project is located in unincorporated Kings County, outside of the jurisdictional areas of the nearby cities. The following sections describe the environmental setting for cultural and paleontological resources in the study area.

Geological Setting

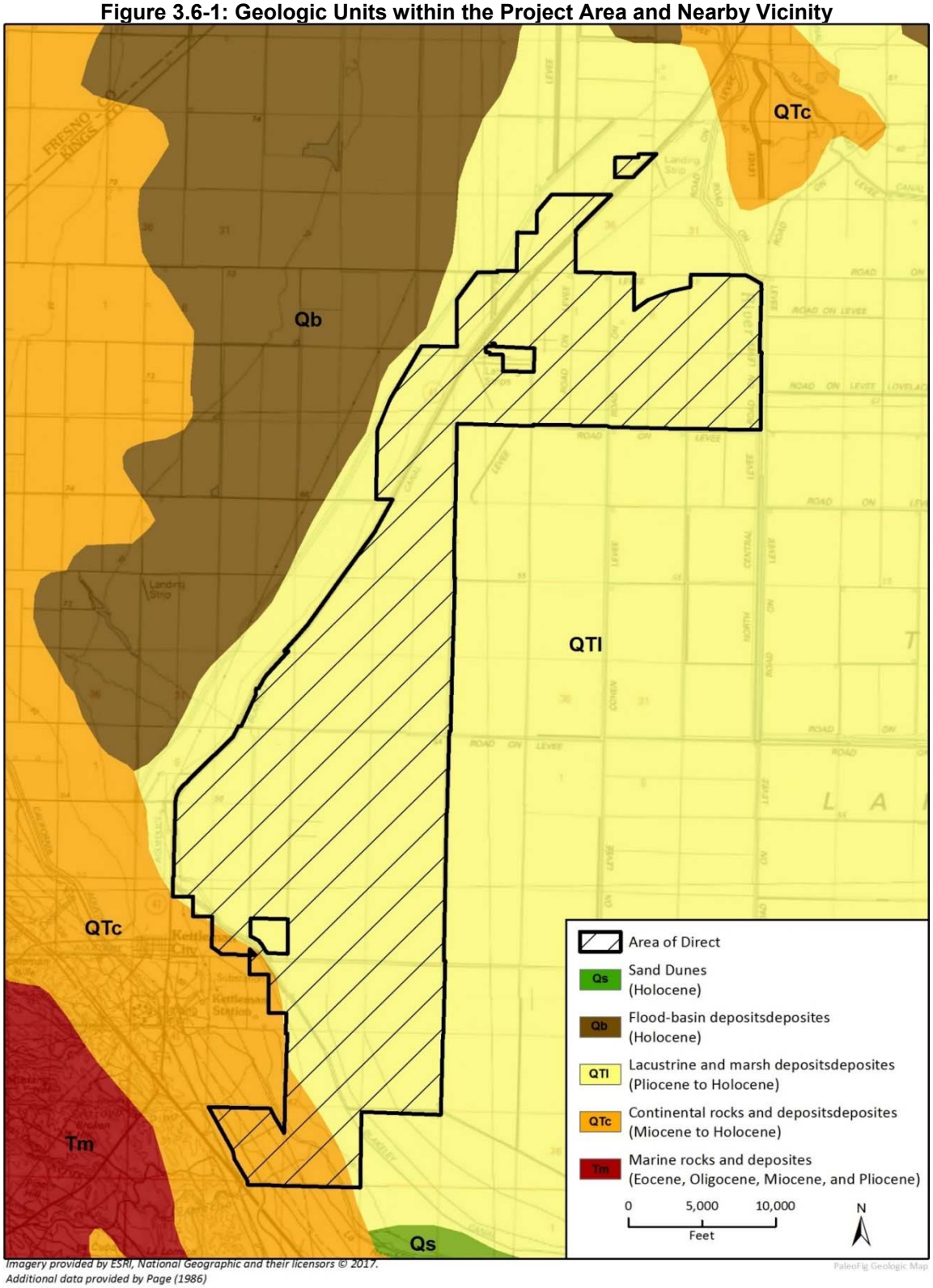
The Project area is located in the Central Valley on the dry lake bed of Tulare Lake, west of Kettleman City, in the San Joaquin Valley. Tulare Lake is now a large, dry depression that has been, in historic times, the site of one of the largest freshwater lakes west of the Great Lakes. Agricultural diversion practices begun in the last century have caused its desiccation (Gobalet and Fenenga, 1993; Negrini et al. 2006).

The Project area is located within the Great Valley geomorphic province, one of 11 naturally defined geologic regions in the state (California Geological Survey [CGS] 2002). The Great Valley is a long (approximately 400 miles north-south), trough-shaped alluvial plain, bounded by granitic, metamorphic, and pre-Cenozoic marine sedimentary rocks (CGS 2002; Page 1983, 1986). The floor of the San Joaquin Valley is comprised of unconsolidated deposits overlying marine and non-marine sedimentary rocks of Tertiary (Croft, 1999). Fossiliferous sandstone, siltstone, and shale comprise the majority of Tertiary rocks in the region of the Project and tend to thicken from east to west and from north to south (Park and Weddle, 1959 as cited in Croft 1999). The Tulare Lake basin lies west of the Kettleman Hills (Woodring et al. 1940). Tulare lake deposits are comprised predominantly of flood-basin, lacustrine, and marsh deposits that range in age from late Pliocene to Holocene. As reported in Croft (1999, pp. H18):

> *"Basal lacustrine beds of the Tulare Formation in the Kettleman Hills are reported to contain the largest fossil fauna of fresh-water mollusks known on the Pacific coast, as well as a highly diverse flora of diatoms. Of the 31 forms of mollusks recognized, only four are identified as living forms."*

Two geologic units are mapped at the surface in the Project area (Page 1986): Pliocene to Holocene lacustrine and marsh deposits (QTl) and Miocene to Holocene continental rocks and deposits (QTc) (**Figure 3.6-1**). The Page (1986) map combined distinct formation-level geologic units by depositional setting. Sediments mapped as lacustrine marsh included the Turlock Lake Formation. Sediments mapped as Holocene continental rocks included five formations: Modesto, Riverbank, Turlock Lake, Tulare, and Kern River All units within these groupings do not necessarily occur within all the areas mapped (Page 1986). Page (1986) includes detailed boring data on the depths of contacts between the formations included in his mapped units. Based on the data included in Page (1986), and other studies from the vicinity (Dibblee and Minch 2006a, 2006b; Gobalet and Fenenga 1993; Matthews and Burnett 1965) terminal Pleistocene/early Holocene deposits occur within the Project area, and surface sediments are all of Holocene age.

Figure 3.6-1: Geologic Units within the Project Area and Nearby Vicinity



Croft (1999) reports on well log data from the immediate vicinity of the Project area and shows mapped Pliocene to Holocene-aged flood-basin, lacustrine and marsh deposits of several hundred feet in thickness within the margins of Tulare Lake, and Pliocene to Holocene-aged continental and alluvial deposits of several hundred feet in thickness west of the lake margins. There is no documentation regarding the depths at which these mapped deposits transition from late Holocene (i.e. less than 5,000 years old) that are too young to support fossils, to middle Holocene and older units that have a record of Pliocene to Holocene-aged fossil assemblages. Throughout California, late Holocene sediments range in thickness from very shallow (less than five feet) to over 150 feet thick.

Cultural Setting

Prehistory

California prehistory is generally divided into five broad time periods: Paleoindian period (ca. 11,550 to 8,550 B.C.), Lower Archaic Period (8,550 to 5,500 B.C.), Middle Archaic Period (5,500 to 550 B.C.), Upper Archaic Period (550 B.C. to A.D. 1100), and Emergent Occupation (A.D. 1000 to European Contact) (Fredrickson 1973, 1994; Moratto, 1984; Rosenthal et al., 2007). Though relatively little archaeological work has been completed around Tulare Lake, research has shown that humans have inhabited the lakeshore almost continuously since as early as 9,000 B.C. (Wallace, 1993). The prehistoric chronological sequence for the Central Valley, presented below, is based on Rosenthal et al. (2007) and Moratto (1984).

Paleoindian Period (11,550–8,550 B.C.)

Currently, the earliest accepted date of human occupation in the Central Valley ranges from 11,550 to 9,550 B.C., represented by fluted projectile points, similar to Clovis points, found at sites near Tracy Lake and the Tulare Lake Basin (Rosenthal et al., 2007). The Witt Site (P-16-000032; CA-KIN-32), recorded outside but near the Project area along the shoreline of a Late Pleistocene lowstand of Tulare Lake, reportedly contained nearly 200 Terminal Pleistocene-style fluted projectile points (Fenenga, 1993; Moratto, 1984:81; Rosenthal et al., 2007:151). It has been suggested that the Witt Site area has produced more Clovis points than any other site in western North America (Gobalet and Fenenga, 1993).

Lower Archaic (8,550–5,550 B.C.)

Climate change at the end of the Pleistocene caused significant periods of alluvial deposition beginning around 9,050 B.C. The Lower Archaic, like the Paleoindian Period, is represented only by limited isolated finds. Only one Lower Archaic site (CA-KER-116 in Kern County) in the Central Valley proper has been radiocarbon dated and few in the foothills surrounding the valley, though numerous Lower Archaic artifacts have been found on the shores of Tulare Lake, both inside and outside of the current Project area (Rosenthal et al. 2007; Rosenthal and Meyer 2004).

Typical Lower Archaic artifacts include flaked stone crescents and stemmed points. The identification of projectile points and a diverse faunal assemblage at CA-KER-116 point to hunting being an important subsistence activity. However, milling tools and plant remains are largely absent in the valley, thus plant use during the Lower Archaic remains unclear. Several foothill sites contain milling implements and evidence of the use of nut crops such as acorn and pine (Lajeunesse and Pryor, 1996). The relationship between foothill and valley floor adaptations is largely unknown during the Lower Archaic, though distinct adaptations are apparent in the Middle Archaic, and it is possible that these divergent traditions first emerged in the Lower Archaic (Rosenthal et al., 2007).

Middle Archaic (5,550–550 B.C.)

The Middle Archaic began with substantial climate change to much warmer, drier conditions. Tulare Lake shrank and eventually disappeared sometime around 5,500 B.C. (Blunt and Negrini, 2015). Fans and floodplains stabilized after an initial period of deposition in 5,550 B.C. Archaeological deposits dating to

the Middle Archaic are rare in the Central Valley proper due to these geomorphic changes. What is available of the Middle Archaic record has revealed a pattern of organized subsistence strategies and increased residential stability (Rosenthal et al., 2007). During this time, the mortar and pestle become more widespread suggesting a shift toward more intensive subsistence practices. Fishing technologies, such as bone gorges, hooks, and spears, also appear during the Middle Archaic suggesting a new focus on fishing. Several other technologies become apparent during this time. Baked-clay impressions of twined basketry, simple pottery, and other baked clay objects have been found at several sites. Personal adornment items also became more frequent. Exchange with outside groups is evidenced by the presence of obsidian, shell beads, and ornaments (Moratto, 1984; Rosenthal et al., 2007). Trade also seemed to be focused on utilitarian items such as obsidian or finished obsidian tools from at least five separate sources (Moratto, 1984).

Upper Archaic (550 B.C.–A.D. 1100)

The Upper Archaic began with the onset of the Late Holocene, marked by a cooler, wetter climate. The environmental conditions of the Upper Archaic were characterized by the return of lakes that had disappeared during the Middle Archaic, including Tulare Lake around A.D. 1000, and a renewed fan and floodplain deposition (Blunt and Negrini, 2015). The Upper Archaic is better represented in the archaeological record than earlier periods. Cultural diversity was more pronounced and is marked by contrasting material cultures throughout the valley (Rosenthal et al., 2007). During this period, numerous specialized technologies were developed such as bone tools and implements, manufactured goods such as *Olivella* and *Haliotis* beads and ornaments, well-made ceremonial blades, and ground-stone plummets. People living in the San Joaquin Valley region traded with neighboring groups for obsidian. Upper Archaic period economies varied by region throughout the Central Valley. Economies were primarily focused on seasonal resources such as acorns, salmon, shellfish, rabbits, and deer (Rosenthal et al., 2007).

Emergent Occupation (A.D. 1100–European Contact)

The stable climatic conditions of the Upper Archaic continued into the Emergent Period. Research on the San Joaquin Valley has been sporadic and limited for this time period, and thus only the Pacheco Complex on the western edge of the valley has been formally defined. After A.D. 1000, many of the technologies witnessed during the Archaic disappeared to be replaced by cultural traditions witnessed at European contact. During the Emergent Period, the bow and arrow replaced the atlatl as the preferred hunting method sometime between A.D. 1000 and 1300.

Increased social complexity is evidenced by increased variation in burial types and offerings and larger residential communities. Grave offerings, such as shell beads, ornaments, and ritually “killed” mortars and pestles, are often found in burials. Pottery was frequently obtained through trade with groups living in the foothills to the east. The Panoche side-notched point became important in the western side of the San Joaquin Valley (Rosenthal et al. 2007). In addition to the side-notched point, the Panoche Complex featured large circular structures, flexed burials, marine shell beads, bone awls, milling stones, and mortars and pestles (Moratto, 1984).

As with the Archaic Period, Emergent Period economies varied geographically, though throughout the Central Valley fishing and plant harvesting increased in importance. Most Emergent residential sites contain diverse assemblages of mammal and bird remains and large amounts of fish bone. After ca. A.D. 1000, the mortar and pestle become the dominant tool type and small seeds increase in archaeological deposits over time (Rosenthal et al., 2007).

Ethnography

The San Joaquin Valley was historically occupied by the Penutian-speaking Yokuts (Kroeber, 1925; Wallace, 1978; Latta, 1999). The Project area is located in an area traditionally inhabited by the Southern Valley Yokuts (Wallace, 1978). Adjacent native groups include the Northern Valley Yokuts to the north, Salinan and Costanoan to the west, Foothill Yokuts and Sierra Miwok to the east, Kitanemuk and Chumash to the south (Kroeber, 1925). The three geographical divisions of the Yokuts are the Northern Valley, Southern Valley, and Foothill Yokuts. The distinction between the three groups is primarily based on language dialect (Mithun, 2001).

The Yokuts established permanent villages. Residential structures were most often of two types: single-family dwellings and larger communal residences that housed ten families or more. Villages frequently included mat-covered granaries and a sweathouse (Mithun, 2001).

Yokuts subsistence was based on a mixed economy focused on fishing, collecting, and hunting small game. Fishermen employed tule rafts and caught fish with nets, spears, basket traps, and bow and arrow. Yokuts often gathered mussels and hunted turtles in lakes, rivers, and streams. Wild seeds and roots contributed a large portion of the Yokuts diet. Tule roots were gathered, dried, and pounded into a flour to be prepared as a mush. Tule seeds and grass and flowering herb seeds were prepared in the same way. Leaves and stems of certain plants, such as clover and fiddle-neck, were also collected. Acorns, a staple of most California Native Americans, were not readily available in the Yokuts ethnographic territory. Some Yokuts tribes journeyed to neighboring groups to trade for acorns. Waterfowl was frequently hunted with snares, nets, and bow and arrow. Land mammals and birds contributed a smaller part of the Yokuts diet. Small game was occasionally taken in snares or traps, or shot with bows and arrows (Wallace, 1978).

The basic economic unit among the Yokuts was the nuclear family. Totemic lineages were based on patrilineal descent. Totem symbols were passed from father to offspring and families sharing the same totem formed an exogamous lineage. Totems were associated with one of two moieties, a division that played a role during ceremonies and other social events (Wallace, 1978).

Yokuts were split into self-governing local groups, most often including several villages. Each group had a chief who directed ceremonies, mediated disputes, handled punishment of those doing wrong, hosted visitors, and provided aid to the impoverished. In certain cases, settlements had two chiefs, one for each moiety. Other political positions included the chief's messenger and the spokesman (Wallace, 1978).

Shamans were also an important part of Yokuts village life. The Yokuts Shaman gained power through a dream or vision. If, after this vision, the man accepted the role as shaman, he would pray, fast, and acquire talismans to aid him in his future work. Shamans had the ability to heal the sick and served the primary role in religious life (Wallace, 1978).

Yokuts technology depended primarily on tule. Stems of the plant served as the raw material for baskets, cradles, boats, housing, and many other items. Tools such as knives, projectile points, and scraping tools were made from imported lithic materials as stone was not readily available in the Central Valley. Marine shells secured through trade with coastal peoples were used in the manufacture of shell money and personal adornment items (Wallace, 1978).

History

The post-Contact history of California is generally divided into three periods: the Spanish period (1769–1822), the Mexican period (1822–1848), and the American period (1848–Present). Each of these periods is briefly described below.

Spanish Period (1769–1822)

Juan Rodriguez Cabrillo in 1542 led the first European expedition to observe what is now called southern California. For more than 200 years, Cabrillo and other Spanish, Portuguese, British, and Russian explorers sailed the Alta (upper) California coast and made limited inland expeditions, but they did not establish permanent settlements (Bean 1968; Rolle 2003).

Gaspar de Portolá and Franciscan Father Junipero Serra established the first Spanish settlement in Alta California at Mission San Diego de Alcalá in 1769. This was the first of 21 missions erected by the Spanish between 1769 and 1823. Portolá continued north, eventually reaching the San Francisco Bay in 1769. In 1772, Pedro Fages led the first Europeans to enter the San Joaquin Valley (Wallace, 1978; Johnson et al., 1993). Fages led a small expedition into the southernmost part of the valley, stopping at a village on the shores of Buena Vista Lake, before heading towards San Luis Obispo (Wallace, 1978). The next European to enter the valley was Francisco Garcés in 1776 (Wallace, 1978). In the early 1800s, numerous expeditions were made into the Central Valley to search for land for new missions or to recapture runaway neophytes (Hoover et al., 2002). However, the Spanish never succeeded in taking control of the region and no missions were established in the Central Valley.

During this period, Spain also deeded ranchos to prominent citizens and soldiers, though very few in comparison to the subsequent Mexican Period. To manage and expand their herds of cattle on these large ranchos, colonists enlisted the labor of the surrounding Native American population, often forcibly (Engelhardt, 1927; Reséndez, 2016). Very few of the Central Valley tribes came under the control of the Spanish missions or ranchos. However, numerous runaway neophytes fled to the Central Valley, influencing local populations (Wallace, 1978). The increased migration to the area and contact with diseases brought by Europeans greatly reduced the Native American population (McCawley, 1996).

Mexican Period (1822–1848)

The Mexican Period commenced when news of the success of the Mexican Revolution (1810-1821) against the Spanish crown reached California in 1822. This period was an era of extensive interior land grant development and exploration by American fur trappers west of the Sierra Nevada Mountains. Beginning in 1833, mission lands were conferred as rancho grants. Governor Pío Pico and his predecessors made more than 600 rancho grants between 1833 and 1846, putting most of the state's lands into private ownership for the first time (Gumprecht, 1999). However, no ranchos were established in the Central Valley proper (Wallace, 1978).

American Period (1848–Present)

The American Period officially began with the signing of the Treaty of Guadalupe Hidalgo in 1848, in which the United States agreed to pay Mexico $15 million for the conquered territory, including California, Nevada, Utah, and parts of Colorado, Arizona, New Mexico, and Wyoming. Settlement of southern California continued dramatically in the early American Period.

The discovery of gold in northern California in 1848 led to the California Gold Rush, though the first California gold was previously discovered in Placerita Canyon near the San Fernando Mission in 1842 (Guinn, 1915; Workman, 1935:26). In 1850, California was admitted into the United States, and by 1853, the population of California exceeded 300,000. Thousands of settlers and immigrants continued to move into the state, particularly after the completion of the transcontinental railroad in 1869.

The first European settlement in what would become Kings County was named Kingston. The town was founded in 1856 on the south bank of the Kings River. Other towns and farming communities, including Lemoore and Hanford, began appearing throughout the area, especially with the completion of the Southern Pacific Railroad in 1877. Kings County was established in 1893 from a portion of Tulare County, and later expanded to include a portion of Fresno County in 1909. In the early 1900's, oil was discovered, leading to the founding of the town of Avenal in 1929. The region became one of the most productive oil fields in the

country in the 1930's. The Naval Air Station Lemoore (NASL) was developed in 1961, and remains an important part of county development (Kings County, 2010e). Today, Kings County remains a largely agriculture-based area.

Tulare Lake

The historic record for the Tulare Lake, once the largest body of fresh water in the U.S. apart from the Great Lakes, is somewhat limited (West et al., 1991). In 1848, John C. Fremont reported that the lake was 70 miles long. In the late 1800s, settlers and commercial fishermen traversed the lake in small schooners and steamboats, collecting terrapin turtles and freshwater mussels (Arax, 1997). In 1880, the state offered marshland of Tulare Lake to farmers for $2.50 per acre, promising that $2 would be refunded if they helped to construct a levee system with the aim of land reclamation. By the 1930s, the lake was dried up, with its sources from the Tule, Kaweah, and Kings Rivers diverted away from the lake basin by a complex system of canals, levees, and dams.

3.6.2 Existing Conditions

Cultural Resources

California Historical Resources Information System Records Search

A search of the cultural resource records housed at the California Historical Resources Information System (CHRIS), Southern San Joaquin Valley Information Center (SSJVIC) located at California State University, Bakersfield (CSUB) was conducted on June 8, 2016. An updated records search was conducted on January 30, 2017. The searches were conducted to identify previous cultural resources work and previously recorded cultural resources within a 0.5-mile radius of the Project area. The CHRIS searches included a review of the CRHR, the NRHP, the California Points of Historical Interest list, the California Historical Landmarks list, the Archaeological Determinations of Eligibility list, and the California State Historic Resources Inventory list. The records searches also included a review of available historic United States Geological Survey (USGS) 7.5- and 15-minute quadrangle maps.

The SSJVIC records search identified a total of 13 previous studies within a 0.5-mile radius of the Project area. Of those previous studies, nine were located within the Project area and encompassed approximately 4,000 acres, or roughly 20% of the 19,700-acre evaluated. However, none of these surveys were conducted within the last five years and are thus considered out of date by cultural resources industry standards.

The SSJVIC records search identified 79 previously recorded cultural resources within a 0.5-mile radius of the Project area. Of those resources, 52 are located directly within the Project area, one is located adjacent to the Project area, and seven are located within 200 feet of the Project area. Of the resources inside the Project area, one is the California Aqueduct Main Canal, five are prehistoric archaeological sites, and 46 are prehistoric isolated artifacts. Each of the resources inside the Project area is discussed in greater detail below.

Prehistoric Isolates

Of the 52 cultural resources inside the Project area, 46 are prehistoric isolates (P-16-000145, -000149 through -000190, -000196, -000210, and -000218). Also, each of the seven resources located within 200 feet of the Project area is a prehistoric isolate (P-16-000146, -000147, and -000191 to -000195). Isolates are defined as three or fewer artifacts within a 30-meter radius and do not qualify as archaeological sites. Of those isolates, 16 are flakes, flake fragments, or pieces of debitage, 14 are manos or mano fragments, four are pestles or pestle fragments, three are metate fragments, three are chert bifaces, four are nondescript groundstone fragments, two are hammerstones, two are stone bowls, one is a net weight, and one is a sandstone pendant. None of these resources were evaluated for listing in the NRHP or CRHR, as isolated artifacts are generally not considered eligible for listing due to a lack of significant data potential. Therefore,

isolates typically do not require management consideration under CEQA or the NHPA. Most of these isolated artifacts were identified near what was the most recurrent shoreline of Tulare Lake, between 185 and 190 feet above mean sea level (West et al. 1991).

Prehistoric Archaeological Sites

Resource P-16-000139 was recorded by J. Gardner, R. Yohe, B. Hemphill, B. Walker, B. Huerta, and C. Vazquez in 2001. The site consists of a small lithic scatter containing groundstone fragments such as a stone bowl, a bowl base fragment, a net weight, a hammerstone, and a metate fragment. The site is located on the 190-foot (58-meter) shoreline of Tulare Lake.

Resource P-16-000141 was recorded by J. Gardner, R. Yohe, B. Hemphill, B. Walker, B. Huerta, and C. Vazquez in 2001. The site consists of a lithic scatter including jasper and chert flakes, two stone bowl fragments, and an Olivella spire-lopped bead. The site is located on the 190-foot (58-meter) shoreline of Tulare Lake.

Resource P-16-000142 was recorded by J. Gardner, R. Yohe, B. Hemphill, B. Walker, B. Huerta, and C. Vazquez in 2001. The site consists of a small lithic scatter containing a chert biface blank and two stone bowl fragments. The site is located on the 190-foot (58-meter) shoreline of Tulare Lake.

Resource P-16-000143 was recorded by J. Gardner, R. Yohe, J. Minor, B. Huerta, and R. Orfila in 2002. The site consists of an extensive lithic scatter containing chert and obsidian flakes and projectile points, jasper flakes and a core, groundstone implements, and scattered debitage. In addition to artifacts found at the site, the site contained a scatter of small fragmented human remains. Because of the presence of human remains at the site, it is presumed significant. The site is located directly adjacent to the Blakely Canal.

Resource P-16-000144 was recorded by J. Gardner, J. Minor, and A. Girado in 2002. The site consists of a lithic scatter with manos, bowl fragments, hammerstones, a quartzite core tool, and debitage. In 2002, the now defunct Center for Archaeological Research at CSUB placed two excavation trenches at the site. The site record does not contain any information regarding the excavation.

California Aqueduct Main Canal

The section of resource P-16-000266, the California Aqueduct main canal, nearest the current APE was recorded by Pamela Daly in 2012. The main canal of the California Aqueduct was completed in the southern San Joaquin Valley in 1968, and reached its goal of delivering water to Los Angeles, San Bernardino, and Riverside counties in 1974. Daly stated that the California Aqueduct main canal was therefore not eligible for listing in the NRHP because it had not yet reached sufficient age. However, the resource was given an NRHP status code of 7N1 and may become eligible for the NRHP once it reaches sufficient age.

Native American Heritage Commission and Informal Outreach

As part of the technical study prepared for the Project, Rincon Consultants (2017) contacted the NAHC to request a review of the Sacred Lands File (SLF) on May 20, 2016. Rincon Consultants received results of the SLF search on May 23, 2016, which stated that a search of the SLF was completed with negative results. In addition to the SLF results, the NAHC provided a list of eight individual or tribal organizations that may have information regarding cultural resources within the Project area. Rincon Consultants prepared and mailed informal outreach letters to each of these contacts on May 23, 2016. As of July 24, 2017, no additional responses have been received.

Assembly Bill 52 Consultation

In January of 2017, Semitropic prepared and mailed a notification letter under AB 52 to the Santa Rosa Rancheria Tachi Yokut Tribe and to the Torres Martinez Desert Cahuilla Indians. The Santa Rosa Rancheria Tachi Yokut Tribe (Tribe) responded to request consultation via letter on January 24, 2017. The Tribe's letter stated that a search of their records indicated the presence of the ethnographic village site of *Walna*,

a minimum of seven recorded sites, one of which contained human remains, and three isolates, within the Project area. On March 21, 2017, the Tribe met with Semitropic to discuss the Project and their concerns. Below is a summary of the results of the meeting.

The Tribe's primary concern is the preservation and protection of human remains and issues relating to looting of archaeological sites that has occurred in the Project area and vicinity. The Tribe requested that a formal plan be put in place for the management of artifacts and human remains, cultural resources sensitivity training for all contractors, a Burial Protection and Treatment Plan, Native American monitoring, and site security during construction to prevent looting of uncovered artifacts. The Tribe also stated that the Santa Rosa Rancheria Tachi Yokut Tribe are the only Most Likely Descendants (MLDs) for the area and requested that they be contacted when any cultural resources are encountered. The Tribe requested to be given copies of the cultural report and survey results as they are completed and for one of their specialists to accompany the archaeologists on surveys. The Tribe further requested that the landowner work with the Tribe to designate a location for the reburial of any remains that cannot be left in place. The Tribe prefers that remains encountered during construction be left in place and only be moved if avoidance is infeasible. The Tribe stated that burials may be inundated and that in some cases a cap may be requested to protect the burial from erosion and exposure.

Paleontological Resources

Paleontological resources (fossils) are the remains and/or traces of prehistoric life. Fossils are typically preserved in layered sedimentary rocks and the distribution of fossils is a result of the sedimentary history of the geologic units in which they occur. Fossils occur in a non-continuous and often unpredictable distribution in some sedimentary units, and the potential for fossils to occur in sedimentary units depends on a number of factors. Although it is not possible to determine whether a fossil would occur in any specific location, it is possible to evaluate the potential for geologic units to contain scientifically significant paleontological resources based on lithology and previous discoveries (if they exist). It is also therefore possible to evaluate the potential for impacts to those resources and provide mitigation for paleontological resources should they be found to occur during construction.

Project Area Geology

The Project is underlain by two geologic units; Holocene to Pleistocene lake/marsh and alluvial (continental) deposits. No formal museum locality searches were conducted for this Project, but online fossil collections data was accessed from the Neogene Mammal Mapping Portal and the University of California Museum of Paleontology. Pleistocene alluvial sediments have an extensive fossil record throughout California and the western United States (Agenbroad 2003; Bell et al. 2004; Dundas et al. 1996; Gobalet and Fenenga 1993; Jefferson 1985, 1991a, 1991b; Maguire and Holroyd 2016; May et al. 2011; Merriam 1911; Miller 1971; Reynolds et al. 1991; Savage et al. 1954; Scott and Cox 2008; Springer et al. 2009; Tomiya et al. 2009; Wilkerson et al. 2011; Winters 1954). Additionally, paleontological monitoring for a nearby project (Biosolids Composting Project, Kings County) within these same sediments produced a large number of fish and invertebrate remains that are potentially fossils (Cogstone 2009). Specific details on the age of the sediments from which the fossils were recovered was not included in the monitoring report. However, these sediments may have been older than 5,000 years, and the recovered remains would be considered early Holocene or Pleistocene fossils. In the Project area, surface deposits are likely late Holocene in age; however, those sediments transition to older (middle to late Holocene, Pleistocene or Pliocene) deposits based on geologic mapping and well-core data (Croft 1999) at unknown depths that have a potential to be as shallow as 3 feet within the Project vicinity.

Paleontological Sensitivity

Paleontological sensitivity refers to the potential for a geologic unit to produce scientifically significant fossils. Direct impacts to paleontological resources occur when earthwork activities, such as grading or trenching, cut into the geologic deposits (formations) in which fossils are buried and physically destroy the fossils. Since fossils are the remains of prehistoric animal and plant life, they are considered to be nonrenewable. Such impacts have the potential to be significant and, under the State CEQA Guidelines, may require mitigation. Sensitivity is determined by rock type, past history of the geologic unit in producing significant fossils, and fossil localities recorded from that unit. Paleontological sensitivity is derived from the known fossil data collected from the entire geologic unit, not just from a specific survey.

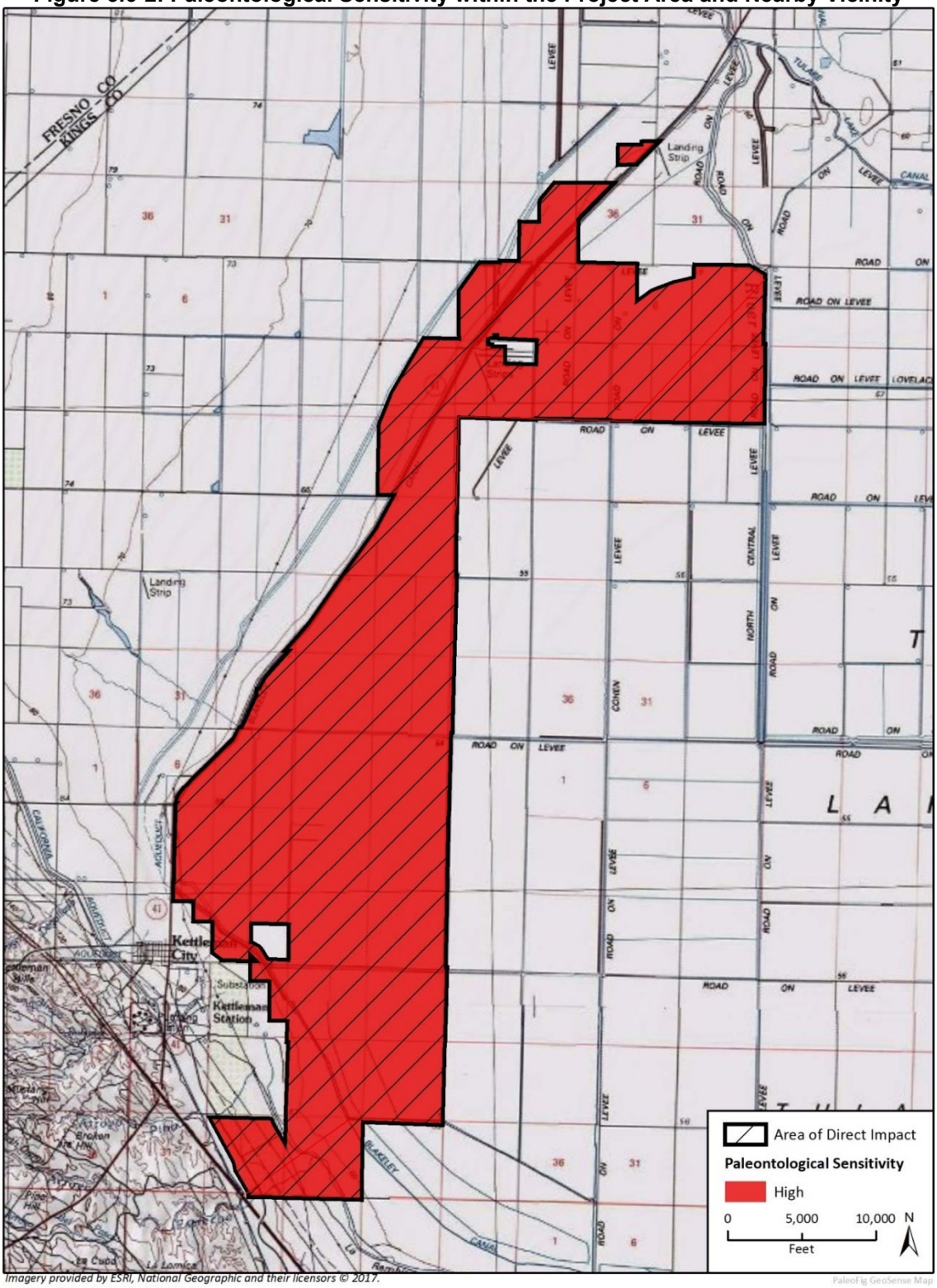
The Society of Vertebrate Paleontology (SVP) outlines in its Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources (2010) guidelines for categorizing paleontological sensitivity of geologic units in a project area. The SVP (2010) describes sedimentary rock units as having a high, low, undetermined, or no potential for containing significant nonrenewable paleontological resources. This criterion is based on rock units in which vertebrate or significant invertebrate fossils have been determined by previous studies to be present or likely to be present. Significant paleontological resources are fossils or assemblages of fossils, which are unique, unusual, rare, uncommon, diagnostically or stratigraphically important, and those that add to an existing body of knowledge in specific areas, stratigraphically, taxonomically, or regionally.

Paleontological sensitivities of geologic units presented here follow standard conventions outlined by the Society of Vertebrate Paleontology (2010), and are based on the known fossil records of sediments of similar age (late Pleistocene to early Holocene) and lithology (alluvial and lacustrine). **Figure 3.6-2** depicts the paleontological sensitivities within the Project area. The Project area has been identified as having high paleontological sensitivity. However, sensitivity is likely low at the surface across the Project area, and recommended mitigation is proposed for construction activities that would exceed three feet in depth **Table 3.6-1** summarizes this information.

Table 3.6-1: Geologic Units within the Project Area

Geologic Unit	Age	Notes	Paleontological Sensitivity (SVP)
Lacustrine and marsh deposits (QTl)	Pliocene to Holocene	Late Pleistocene to early Holocene at/near surface	High
Continental deposits (QTc)	Miocene to Holocene	Late Pleistocene to early Holocene at/near surface	High

Figure 3.6-2: Paleontological Sensitivity within the Project Area and Nearby Vicinity



3.6.3 Regulatory Framework

Federal Policies and Regulations

Projects that involve federal funding or permitting (i.e., have a federal nexus) must comply with the provisions of the National Historic Preservation Act of 1966 (NHPA), as amended (16 United States Code [U.S.C.] 470f). Cultural resources are considered during federal undertakings chiefly under Section 106 of the NHPA through one of its implementing regulations, 36 Code of Federal Regulations (CFR) 800 (Protection of Historic Properties), as well as the National Environmental Policy Act (NEPA). Properties of traditional religious and cultural importance to Native Americans are considered under Section 101(d)(6)(A) of the NHPA. Other relevant federal laws include the Archaeological Data Preservation Act of 1974, American Indian Religious Freedom Act of 1978, Archaeological Resources Protection Act of 1979, and Native American Graves Protection and Repatriation Act of 1989.

National Historic Preservation Act (NHPA) of 1966 (16 U.S.C. §§ 470 Et Seq.)

The NHPA is a federal law created to avoid unnecessary harm to historic properties. The NHPA includes regulations that apply specifically to federal land-holding agencies, but also includes regulations (Section 106) that pertain to all projects funded, permitted, or approved by any federal agency that have the potential to affect cultural resources. Provisions of the NHPA establish a National Register of Historic Places (maintained by the National Park Service), the Advisory Council on Historic Preservation, the State Historic Preservation Office (SHPO), and federal grants-in-aid programs.

National Register of Historic Places

The National Register of Historic Places (NRHP) was established by the NHPA of 1966 as "an authoritative guide to be used by Federal, State, and local governments, private groups and citizens to identify the Nation's cultural resources and to indicate what properties should be considered for protection from destruction or impairment" (36 CFR 60.2). The NRHP recognizes properties that are significant at the national, state, and local levels. To be eligible for listing in the NRHP, a resource must be significant in American history, architecture, archaeology, engineering, or culture. Districts, sites, buildings, structures, and objects of potential significance must also possess integrity of location, design, setting, materials, workmanship, feeling, and association. A property is eligible for the NRHP if it is significant under one or more of the following criteria:

Criterion A: It is associated with events that have made a significant contribution to the broad patterns of our history.

Criterion B: It is associated with the lives of persons who are significant in our past.

Criterion C: It embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction.

Criterion D: It has yielded, or may be likely to yield, information important in prehistory or history.

Secretary of the Interior's Standards

The Secretary of the Interior is responsible for establishing professional standards and providing guidance related to the preservation and protection of all cultural resources listed in or eligible for listing in the NRHP.

American Indian Religious Freedom Act of 1978 (42 U.S.C. §§ 1996 and 1996a) and the Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. §§ 3001 et seq.)

The American Indian Religious Freedom Act of 1978 and Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. §§ 3001 et seq.) establish that traditional religious practices and beliefs, sacred sites, and the use of sacred objects shall be protected and preserved.

National Environmental Policy Act of 1969

NEPA (U.S.C., §4321 et seq.; 40 CFR 1502.25), as amended, directs Federal agencies to "Preserve important historic, cultural, and natural aspects of our national heritage (42 U.S.C. 4331 §101[b] [4])."

State Policies and Regulations

California Environmental Quality Act

The California Environmental Quality Act (CEQA) requires a lead agency to analyze whether historic and/or archaeological resources may be adversely impacted by a proposed project. Under CEQA, a "project that may cause a substantial adverse change in the significance of a historic resource is a project that may have a significant effect on the environment" (California Public Resources Code [PRC], Section 21084.1). Answering this question is a two-part process: first, the determination must be made as to whether the proposed project involves cultural resources and, second, if cultural resources are present, the proposed project must be analyzed for a potential "substantial adverse change in the significance" of the resource.

With regards to paleontological resources, CEQA requires that public agencies and private interests identify the potential environmental consequences of their proposed projects on any object or site of significance to the scientific annals of California (Division I, California Public Resources Code Section 5020.1 [b]). Appendix G in Section 15023 provides an Environmental Checklist of questions including a single question related to paleontological resources (Section 15023, Appendix G, Section V, Part c) as follows: "Would the project directly or indirectly destroy a unique paleontological resource or site…?"

CEQA does not define "a unique paleontological resource or site." However, the Society of Vertebrate Paleontology (SVP) has defined a "significant paleontological resource" in the context of environmental review. The SVP defines a Significant Paleontological Resource as:

> *…fossils and fossiliferous deposits, here defined as consisting of identifiable vertebrate fossils, large or small, uncommon invertebrate, plant, and trace fossils, and other data that provide taphonomic, taxonomic, phylogenetic, paleoecologic, stratigraphic, and/or biochronologic information. Paleontological resources are considered to be older than recorded human history and/or older than middle Holocene (i.e., older than about 5,000 radiocarbon years).*

The loss of paleontological resources that meet the criteria outlined above (i.e. considered a significant paleontological resource) would be considered a significant impact under CEQA, and the CEQA lead agency is responsible for ensuring that paleontological resources are protected in compliance with CEQA and other applicable statutes.

California Register of Historical Resources

The California Register of Historical Resources (CRHR) is a guide to cultural resources that must be considered when a government agency undertakes a discretionary action subject to CEQA. The CRHR helps government agencies identify, evaluate, and protect California's historical resources, and indicates which properties are to be protected from substantial adverse change (PRC §5024.1(a)). The CRHR is administered through the SHPO that is part of the California State Parks system.

A cultural resource is evaluated under four CRHR criteria to determine its historical significance. A resource must be significant at the local, state, or national level in accordance with one or more of the following criteria set forth in the State CEQA Guidelines, Section 15064.5(a)(3):

1) *It is associated with events that have made a significant contribution to the broad pattern of California's history and cultural heritage;*
2) *It is associated with the lives of persons important in our past;*
3) *It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or*
4) *It has yielded, or may be likely to yield, information important in prehistory or history.*

In addition to meeting one or more of the above criteria, the CRHR requires that sufficient time must have passed to allow a "scholarly perspective on the events or individuals associated with the resource." Fifty years is used as a general estimate of the time needed to understand the historical importance of a resource, according to SHPO publications. The CRHR also requires a resource to possess integrity, which is defined as "the authenticity of a historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association." Archaeological resources can sometimes qualify as "historical resources" (State CEQA Guidelines, Section 15064.5[c][1]).

According to CEQA, all buildings constructed over 50 years ago that possess architectural or historical significance may be considered potential historic resources. Most resources must meet the 50-year threshold for historic significance. However, resources less than 50 years in age may be eligible for listing on the CRHR if it can be demonstrated that sufficient time has passed to understand their historical importance.

In addition, if a project can be demonstrated to cause damage to a unique archaeological resource, the lead agency may require reasonable efforts to permit any or all of these resources to be preserved in place or left in an undisturbed state. To the extent that resources cannot be left undisturbed, mitigation measures are required (PRC Section 21083.2[a], [b], and [c]).

PRC Section 21083.2(g) defines a unique archaeological resource as an 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; or*
2) *Has a special and particular quality such as being the oldest of its type or the best available example of its type; or*
3) *Is directly associated with a scientifically recognized important prehistoric or historic event or person.*

The State administers two other programs: California Historical Landmarks and California Points of Historical Interest. California Historical Landmarks are buildings, sites, features, or events that are of statewide significance and have anthropological, cultural, military, political, architectural, economic, scientific or technical, religious, experimental, or other historical value. California Points of Historical Interest are buildings, sites, features, or events that are of local (city or county) significance and have anthropological, cultural, military, political, architectural, economic, scientific, technical, religious, experimental, or other historical value.

Impacts to cultural resources that affect the characteristics of any resource that qualify it for the NRHP or adversely alter the significance of a resource listed in or eligible for listing in the CRHR are considered a significant effect on the environment. These impacts could result from physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired (State CEQA Guidelines, Section 15064.5 [b][1], 2000). Material impairment is defined as demolition or alteration in an adverse manner (of) those characteristics of an historical resource that convey its historical significance and that justify its inclusion in or eligibility for inclusion in the CRHR (State CEQA Guidelines, Section 15064.5[b][2][A]).

Codes Governing Human Remains

Section 15064.5 of the State CEQA Guidelines also assigns special importance to human remains and specifies procedures to be used when Native American remains are discovered. The disposition of human remains is governed by Health and Safety Code (HSC) Section 7050.5 and PRC Sections 5097.94 and 5097.98, and falls within the jurisdiction of the Native American Heritage Commission (NAHC). If human remains are discovered, the County Coroner must be notified within 48 hours and there should be no further disturbance to the site where the remains were found. If the remains are determined by the coroner to be Native American, the coroner is responsible for contacting the NAHC within 24 hours. Pursuant to PRC Section 5097.98, the NAHC would immediately notify those persons it believes to be most likely descended from the deceased Native Americans so they can inspect the burial site and make recommendations for treatment or disposal.

Assembly Bill 52

As of July 1, 2015, California Assembly Bill 52 of 2014 (AB 52) was enacted and expands CEQA by defining a new resource category, "tribal cultural resources." AB 52 establishes that a "project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment" (PRC, Section 21084.2). It further states that the lead agency shall establish measures to avoid impacts that would alter the significant characteristics of a tribal cultural resource, when feasible (PRC, Section 21084.3). PRC Section 21074 (a)(1)(A) and (B) defines tribal cultural resources as "sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe" and meets either of the following criteria:

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

b) 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 Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

AB 52 also establishes a formal consultation process for California tribes regarding those resources. The consultation process must be completed before a CEQA document can be certified. AB 52 requires that lead agencies "begin consultation with a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project." Native American tribes to be included in the process are those that have requested notice of projects proposed within the jurisdiction of the lead agency.

Local Policies and Regulations

2035 Kings County General Plan

Resource Conservation Element

The 2035 Kings County General Plan, Resource Conservation Element (Kings County, 2010i) includes the following relevant policies addressing cultural resources:

- *RC Policy I1.1.2*: Direct proposed developments that may affect proposed or designated historic sites or County landmarks to the Kings County Museum Advisory Committee or other similarly purposed advisory body under the Kings County Parks and Recreation Advisory Commission for review and comment.
- *RC Policy I1.1.3*: Encourage the protection of cultural and archaeological sites with potential for placement on the National Register of Historic Places and/or inclusion in the California Inventory of Historic Resources.
- *RC Policy I1.1.4*: Refer applications that involve the removal, destruction, or alteration of proposed or designated historic sites or County landmarks to the Kings County Museum Advisory Committee or its successor for recommended mitigation measures.
- *RC Policy I1*.2.1: Participate in and support efforts to identify significant cultural and archaeological resources and protect those resources in accordance to PRC 5097.9 and 5097.993.
- *RC Policy I1*.2.2: Continue to solicit input from local Native American communities in cases where development may result in disturbance to sites containing evidence of Native American Activity and/or to sites of cultural importance.
- *RC Policy I1*.2.3: Address archaeological and cultural resources in accordance with the CEQA for discretionary land use applications.
- *RC Policy I1*.2.5: The County will respectfully comply with Government Code §6254(r) and 6254.10 by protecting confidential information concerning Native American cultural resources. For example, adopting the internal procedures such as keeping confidential archaeological reports away from public view or discussion in public meetings.
- *RC Policy I1.2.6:* The County shall work in good faith with the Santa Rosa Rancheria Tachi Yokut Tribe ("Tribe"), the developer and other parties if the Tribe requests return of certain Native American artifacts from private development projects (e.g., for interpretive or educational value). The developer is expected to act in good faith when considering the Tribe's request for artifacts. Artifacts not desired by the Tribe shall be placed in a qualified repository as established by the California State Historical Resources Commission (see Guidelines for the Curation of Archaeological Collections, May 1993). If no facility is available, then all artifacts shall be donated to the Tribe.
- *RC Policy I1*.2.7: The County shall work with the developer of any "gated community" (i.e. not open to the public), to ensure that Native Americans are allowed future access, under reasonable conditions to view/visit known sites within the "gated community." If a village site is identified within a gated community project, the developer shall be conditioned to allow future access by Native Americans to view/visit that village site.

3.6.4 Impact Analysis

Methodology for Analysis

Potential impacts on cultural, paleontological, and tribal cultural resources are analyzed based on the potential for the Project to impact the resources described above in *Section 3.6.1, Environmental Setting* or any as-yet unidentified resources during construction or operation. The proposed Project would be constructed over the course of several years, and is expected to take up to 3 to 5 years to complete. Due to the large Project area and the nature of Project construction activities, it was determined that a more complete survey of the property at this time would not provide added information that would alter the evaluation of impacts to cultural, paleontological, and tribal cultural resources nor identify any mitigation measure beyond those identified herein. Pursuant to recommended mitigations (described below), more detailed in-field cultural resources surveys would be conducted as the Project is implemented, ensuring that cultural, paleontological, and tribal cultural resources are adequately protected.

Cultural Resources

The significance of a cultural resource or subsequent impact is determined by, among other things, consideration of whether or not that resource can increase knowledge of the past. The determining factors are site content and degree of preservation. A finding of archaeological significance follows the criteria established in the State CEQA Guidelines.

State CEQA Guidelines Section 15064.5 (Determining the Significance of Impacts to Archaeological Resources) states:

> *(3) […] Generally, a resource shall be considered by the lead agency to be "historically significant" if the resource meets the criteria for listing on the California Register of Historical Resources (PRC § 5024.1, Title 14 California Code of Regulations [CCR], § 4852).*
>
> *(4) The fact that a resource is not listed in, or determined to be eligible for listing in the California Register of Historical Resources, not included in a local register of historical resources (pursuant to Section 5020.1(k) of the PRC), or identified in an historical resources survey (meeting the criteria in Section 5024.1(g) of the PRC) does not preclude a lead agency from determining that the resource may be an historical resource as defined in PRC Sections 5020.1(j) or 5024.1.*
>
> *(b) A project with an effect that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment.*

Historical resources are "significantly" affected if there is demolition, destruction, relocation, or alteration of the resource or its surroundings. Generally, impacts to historical resources can be mitigated to below a level of significance by following the *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings* or the *Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings* [State CEQA Guidelines § 15064.6(b)]. In some circumstances, documentation of a historical resource by way of historic narrative photographs or architectural drawings would not mitigate the impact of demolition below the level of significance [State CEQA Guidelines § 15126.4(b)(3)]. Preservation in place is the preferred form of mitigation for archaeological resources as it retains the relationship between artifact and context, and may avoid conflicts with groups associated with the site [State CEQA Guidelines § 15126.4 (b)(3)(A)]. If an archaeological resource does not meet either the historic resource or the more specific "unique archaeological resource" definition, impacts do not need to be mitigated [State CEQA Guidelines § 15064.5(e)]. Where the significance of a site is unknown, it is presumed to be significant for the purpose of the EIR investigation.

Paleontological Resources

In general terms, for geologic units with high sensitivity, ground disturbing construction activities have the potential to damage or destroy unique or scientifically important fossils, resulting in significant impacts to paleontological resources. For geologic units with low sensitivity, impacts to paleontological resources are unlikely to occur. Full-time monitoring is typically recommended for ground disturbing activity in geologic units with high paleontological sensitivity. Protection or salvage efforts typically are not required for geologic units with low paleontological sensitivity.

Tribal Cultural Resources

Potential impacts on tribal cultural resources (TCRs) are analyzed based on the potential for the Project to impact any tribal cultural resources during construction or operation. The significance of a TCR and subsequent significance of any impact is determined by, among other things, consideration of whether or not that resource has heritage value to California Native Americans.

Thresholds of Significance

For the purposes of this analysis, an impact to cultural, paleontological, or tribal cultural resources would be significant if the Project would:

- Cause a substantial adverse change in the significance of an historical resource as defined in Public Resources Code Section 15064.5
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to Public Resources Code Section 15064.5
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature of paleontological or cultural value
- Disturb any human remains, including those interred outside of dedicated cemeteries
- Cause a substantial adverse change in the significance of a TCR, 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:
    - Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k), or
    - 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 Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

Impacts and Mitigation Measures

Rather, Project implementation is expected to occur over a 3- to 5-year time period within a large Project area. Therefore, analysis of the potential impacts of the Project on cultural resources is discussed here considering site-specific investigations, monitoring and/or mitigations would occur during completion of design and prior to construction, as appropriate to the facility location and any previously-identified resources. Any specific impacts would be addressed as the Project is executed.

Impact CR-1 Impact Historical and Unique Archaeological Resources

Construction, Operations, and Maintenance

All Facilities

The entirety of the Project area is known to be sensitive for archaeological resources because of the presence of the Tulare Lake shoreline and the known quantity of cultural resources within the Project area. Additionally, numerous previously-recorded cultural resources in and around the Project area have been identified as containing human remains, thus increasing the overall sensitivity of the location. However, most of the cultural resources are located near the Blakeley Canal and in other areas where there would be no Project excavations or ground-disturbing activities. In addition, as the area where Project construction would occur has been farmed and tilled in the past, past agricultural operations have likely disturbed or destroyed archaeological and paleontological resources. Nevertheless, it is possible that activities resulting from implementation of the proposed Project, including construction-related ground-disturbing activities and any operations and maintenance (O&M) ground-disturbing activity, could damage or destroy archaeological resources, resulting in a significant impact. **Mitigation Measure (MM) CR-1** would ensure that the Project area is further surveyed as Project components are planned and executed. This segmented approach to cultural resources investigations would ensure that the investigation standards and findings would be conducted to current professional standards and with current data at those future dates given the extended implementation of the Project and the expiration of cultural resources surveys after a period of five years. **MMs CR-2, CR-3, CR-4, CR-5**, and **CR-6** would ensure that impacts to any known or as yet unidentified cultural resources are reduced to the extent feasible.

Significance Determination before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure CR-1: Conduct Cultural Resources Investigation of the Project Area.

As specific elements of the Project are executed (e.g., reservoir sited), the applicant shall retain an archaeologist meeting the Secretary of the Interior's (SOI) Professional Qualification Standards (PQS) to complete a Phase 1 archaeological inventory of the Project area. A Phase 1 archaeological inventory should include a pedestrian survey of the Project area and sufficient background archival research. Archival research should include an updated records search conducted at the Southern San Joaquin Valley Information Center and a Sacred Lands File Search conducted with the Native American Heritage Commission. The results of the study should be discussed in a cultural resources technical report, which should list the findings and management recommendations, such as construction monitoring and/or additional studies (e.g., an Extended Phase I [XPI] or Phase II investigation).

Mitigation Measure CR-2: Avoid Archaeological Sites within the Project area.

Archaeological resources P-16-000139 and -000141 through -000144 are located within the Project area. To protect these resources from any potential disturbances during construction, these sites, as well as any previously unrecorded archaeological sites identified during future surveys, shall be avoided. Avoidance means that no ground disturbance shall take place within the archaeological site boundaries, if feasible. Ground disturbing activities include, but are not limited to, grading or inundation. Additionally, the boundaries for each archaeological resource site shall be delineated with temporary fencing (e.g., stakes or safety fencing) and no activities related to the Project shall take place within the fenced areas. If intact deposits pertaining to these archaeological resources are identified outside of the delineated boundaries as a part of ground disturbing activities for this Project, all activities within the immediate vicinity of the discovery shall halt until a qualified archaeologist can assess the find.

Mitigation Measure CR-3: Conduct Phase II Cultural Resources Evaluation(s)

Avoidance is the preferred measure for archaeological sites; however, avoidance is not always feasible. For any archaeological site within the Project area that cannot be avoided, including P-16-000139 and -000141 through -000144 or any previously unrecorded sites identified during future surveys a Phase II Site Evaluation shall be conducted. The study(ies) shall be conducted by a qualified archaeologist under the direction of a principal investigator meeting the Secretary of the Interior's Professional Qualification Standards for archaeology (National Park Service [NPS] 1983). The Phase II testing shall comprise subsurface testing designed to identify the extent of a subsurface deposit within the Project area and to evaluate the site(s) in question for listing in the CRHR and NRHP. A standard Phase II investigation should include a testing plan and research design to allow for a formal CRHR/NRHP evaluation. The evaluation shall include any recommendations for additional work at the site(s). If a resource is determined ineligible for the CRHR and NRHP from a Phase II investigation, the resource requires no further management consideration under CEQA. Should the resource be determined eligible for the CRHR and NRHP, additional studies (e.g., Phase III data recovery) may be needed to mitigate significant impacts.

Mitigation Measure CR-4: Conduct Phase III Cultural Resources Data Recovery

If any archaeological sites in the Project area are determined to be eligible for listing in the NRHP and CRHR and avoidance is not feasible, the applicant shall undertake a Phase III data recovery excavation. The extent of a Phase III investigation shall be determined on a case-by-case basis to be determined by the qualified archaeologist in consultation with the lead agency. A typical Phase III investigation includes extensive subsurface testing and a full analysis of additional background research, the publication of scholarly work, and preparation of interpretive materials to exhaust the data potential of the archaeological site. Special studies such as radiocarbon dating, faunal analysis, macro/microfloral analysis, artifact analysis, and protein residue analysis are typical studies included in a Phase III investigation.

Mitigation Measure CR-5: Archaeological Sensitivity Training

A qualified archaeologist shall be retained to conduct a Worker Environmental Awareness Program (WEAP) training for archaeological sensitivity for all construction personnel prior to the commencement of any ground disturbing activities. Archaeological sensitivity training should include a description of the types of cultural material that may be encountered, cultural sensitivity issues, regulatory issues, and the proper protocol for treatment of the materials in the event of a find.

Mitigation Measure CR-6: Archaeological and Native American Monitoring

If the results of the studies required under MM CR-1 determine that monitoring during construction is required, all ground disturbance within those areas determined to be sensitive for archaeological resources shall be observed by archaeological and Native American monitors. Archaeological monitoring shall be performed by a qualified archaeologist working under the direction of an archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for prehistoric archaeology (NPS, 1983). The qualified archaeologist may reduce or stop monitoring dependent upon observed conditions.

Mitigation Measure CR-7: Unanticipated Discovery of Cultural Resources

If cultural materials not identified during the studies required under MM CR-1 are unearthed during construction, all work in the immediate vicinity of the find must halt and the find evaluated for significance under CEQA and the NHPA. Evaluation of significance for the find may include the determination of whether or not the find qualifies as an archaeological site. Isolated finds do not qualify as historic properties under the NHPA or historical resources under CEQA and require no management

consideration under either regulation. After effects to the find have been appropriately mitigated to the extent feasible, work in the area may resume. Mitigation of effects to the find may include a damage assessment of the find, archival research, and/or data recovery to remove any identified archaeological deposits, as determined by a qualified archaeologist.

Mitigation Measure CR-8: Site Security Measures

To prevent looting or destruction of archaeological sites, the applicant shall provide after-hours site security when archaeological remains are exposed by archaeological testing or construction activities. Site security may include security personnel, fencing, and/or the installation of temporary security cameras and shall be determined on a case-by-case basis and in coordination with the qualified archaeologist and Native American monitor.

Significance Determination after Mitigation

Less than significant. Although the majority of the Project area has not been surveyed for cultural resources adherence to these mitigation measures are expected to avoid or substantially lessen potentially significant effects to less than significant levels. The Tulare Lake basin was a focus of human habitation for at least 10,000 years and there is a high likelihood of identifying archaeological sites significant for both their scientific and heritage value. AB 52 consultations with affiliated tribes yielded a process for treating resources identified within the Project area over the course of project implementation. This indicates that the tribes have offered processes to help mitigate the heritage value of resources within the Project area. Adherence to Mitigation Measures CR-1 through CR-8 would help mitigate impacts to the scientific value of any identified resources and are designed to exhaust the data potential of any significant resources that cannot be avoided by project design or implementation. Given the presence of terminal Pleistocene/early Holocene cultural resources deposits within the region, robust data recovery programs may be required.

Impact CR-2 Impact Historical Resources

Construction, Operations, and Maintenance

All Facilities. The Project area contains a potentially historical resource, the California Aqueduct main canal. Mitigation Measures CR-9 and CR-10 would ensure that impacts to the California Aqueduct main canal are reduced to the extent feasible. Mitigation Measure CR-1 above and CR-11 and CR-12 below would substantially lessen impacts to unknown historical resources to the extent feasible. O&M activities would not impact historical resources.

Significance Determination before Mitigation

Potentially Significant

Mitigation Measures

Mitigation Measure CR-9: Evaluation of P-16-000266 (California Aqueduct Main Canal)

The California Aqueduct main canal is not currently of sufficient age to be considered eligible for listing in the NRHP or CRHR as it has only been in use since 1974. However, the portion of the California Aqueduct main canal in the Project area may qualify for the NRHP under Criteria Consideration G for properties that have achieved significance within the past 50 years. Should any Project related activities have the potential to directly or indirectly impact the resource, the canal shall be evaluated for CRHR and NRHP eligibility by an architectural historian meeting the Secretary of the Interior's Professional Qualification Standards to determine if any potential impacts on the resource would be significant under CEQA.

Mitigation Measure CR-10: Treatment of P-16-000266 (California Aqueduct Main Canal)

If resource P-16-000266 (California Aqueduct Main Canal) is found to be eligible for the NRHP and/or CRHR, the resource shall be fully documented following the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings or the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings [State CEQA Guidelines § 15064.6(b)]. Documentation shall include photography, architectural drawings, and written descriptions.

Mitigation Measure CR-11: Evaluation of Historical Resources

Should any potential historical resources be identified during activities conducted under MM CR-1, those resources shall be evaluated for CRHR and NRHP eligibility by an architectural historian meeting the Secretary of the Interior's Professional Qualification Standards to determine if any potential impacts on the resource would be significant under CEQA.

Mitigation Measure CR-12: Treatment of Historical Resources

If resources evaluated under MM CR-11 are found to be eligible for the NRHP and/or CRHR, the resource(s) shall be fully documented following the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings or the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings [State CEQA Guidelines § 15064.6(b)]. Documentation shall include photography, architectural drawings, and written descriptions.

Significance Determination after Mitigation

Less than significant.

Impact CR-3 Have a Significant Impact on Paleontological Resources

Construction, Operations, and Maintenance

All Facilities

As discussed above in Section 3.6.2, two geologic units are mapped in the Project area (**Table 3.6-1**). Any artificial fill, such as road base, is entirely human-introduced and thus has no paleontological potential. Any late Holocene deposits (<5,000 years) are too young to contain fossils and so have no paleontological potential (SVP 2010). However, early Holocene to late Pleistocene sediments underlie the entire Project area and may occur at depths as shallow as three feet below the surface. These older early-mid-Holocene and/or Pleistocene sediments are considered to have a high paleontological sensitivity. Ground-disturbing activities in geologic units with high paleontological sensitivity have the potential to damage or destroy paleontological resources. Therefore, activities resulting from implementation of the proposed Project, including construction-related earth-disturbing activities, and any operation phase (including maintenance activity) ground disturbing activity could damage or destroy fossils in these geologic units resulting in a significant impact. Mitigation Measure CR-8 would ensure that potential impacts to paleontological resources would be assessed, avoided, and mitigated through implementation of a policy designed to protect paleontological resources.

Significance Determination before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure CR-13: Retain a Qualified Paleontologist

Prior to initial ground disturbance, the applicant shall retain a Project paleontologist, defined as a paleontologist who meets the SVP standards for Qualified Professional Paleontologist, to direct all mitigation measures related to paleontological resources. A qualified paleontologist (Principal Paleontologist) is defined by the SVP standards as an individual with an M.S. or Ph.D. in paleontology or geology who is experienced with paleontological procedures and techniques, who is knowledgeable in the geology of California, and who has worked as a paleontological mitigation project supervisor for a least one year.

Mitigation Measure CR-14: Paleontological Mitigation and Monitoring Program

Prior to construction activity a qualified paleontologist should prepare a Paleontological Mitigation and Monitoring Program to be implemented during construction phase or O&M ground disturbance activity for the proposed Project. This program should outline the procedures for construction staff Worker Environmental Awareness Program (WEAP) training, paleontological monitoring extent and duration, salvage and preparation of fossils, the final mitigation and monitoring report, and paleontological staff qualifications.

Mitigation Measure CR-15: Paleontological WEAP

Prior to the start of construction, the Project paleontologist or his or her designee, shall conduct training for construction personnel regarding the appearance of fossils and the procedures for notifying paleontological staff should fossils be discovered by construction staff. The WEAP shall be fulfilled at the time of a preconstruction meeting at which a qualified paleontologist shall be present.

Mitigation Measure CR-16: Paleontological Monitoring

Ground disturbing construction or O&M activities (including grading, trenching, foundation work and other excavations) exceeding three feet in depth in areas mapped as high paleontological sensitivity (i.e., Project-wide; **Figure 3.6-2**) should be monitored on a full-time basis by a qualified paleontological monitor during initial ground disturbance. Monitoring should be conducted by a qualified paleontological monitor who is defined as an individual who has experience with collection and salvage of paleontological resources. The duration and timing of the monitoring would be determined by the Project paleontologist. If the Project paleontologist determines that full-time monitoring is no longer warranted, he or she may recommend that monitoring be reduced to periodic spot-checking or cease entirely. Monitoring would be reinstated if any new or unforeseen deeper ground disturbances are required and reduction or suspension would need to be reconsidered by the Supervising Paleontologist. Ground disturbing activity that does not exceed 3 feet in depth would not require paleontological monitoring.

Mitigation Measure CR-17: Salvage of Fossils

In the event of a fossil discovery by construction personnel, all work in the immediate vicinity of the find shall cease and a qualified paleontologist shall be contacted to evaluate the find before restarting work in the area. If it is determined that the fossil(s) is(are) scientifically significant, the qualified paleontologist (e.g., the Project paleontologist or monitor) should recover them. Typically, fossils can be safely salvaged quickly by a single paleontologist and not disrupt construction activity. In some cases, larger fossils (such as complete skeletons or large mammal fossils) require more extensive excavation and longer salvage periods. In this case the paleontologist should have the authority to temporarily direct, divert or halt construction activity to ensure that the fossil(s) can be removed in a safe and timely manner.

Mitigation Measure CR-18: Preparation and Curation of Recovered Fossils

Once salvaged, significant fossils should be identified to the lowest possible taxonomic level, prepared to a curation-ready condition and curated in a scientific institution with a permanent paleontological collection (such as the University of California Museum of Paleontology), along with all pertinent field notes, photos, data, and maps. Fossils of undetermined significance at the time of collection may also warrant curation at the discretion of the Project paleontologist.

Mitigation Measure CR-19: Final Paleontological Mitigation Report

Upon completion of ground disturbing activity (and curation of fossils if necessary) the qualified paleontologist should prepare a final mitigation and monitoring report outlining the results of the mitigation and monitoring program. The report should include discussion of the location, duration and methods of the monitoring, stratigraphic sections, any recovered fossils, and the scientific significance of those fossils, and where fossils were curated.

Significance Determination after Mitigation

Less than significant.

Impact CR-4 Impact Human Remains

Construction, Operations, and Maintenance

All Facilities

The discovery of human remains is always a possibility during ground disturbance associated with construction and O&M activities. Archaeological site P-16-000143, located inside the Project area, is known to contain human remains. MM CR-2 requires avoidance, if feasible, of archaeological sites inside the Project area, including P-16-000143. Should avoidance of this site not be feasible, MM CR-20 below would reduce the level of impact. MMs CR-21 is required in the case of discovery of unanticipated human remains. If human remains are found, the State of California Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. In the event of an unanticipated discovery of human remains, the Kings County Coroner must be notified immediately. If the human remains are determined to be prehistoric, the coroner would notify the Native American Heritage Commission, which would determine and notify a most likely descendant (MLD). The MLD shall complete the inspection of the site within 48 hours of notification and may recommend scientific removal and nondestructive analysis of human remains and items associated with Native American burials.

Significance Determination before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure CR-20: Burial Protection and Treatment Plan

Prior to Project construction, the applicant shall retain a qualified archaeologist meeting the Secretary of the Interior's Historic Preservation Professional Qualification Standards to prepare a Burial Protection and Treatment Plan. This Plan shall outline the steps to take in the event of the discovery of human remains, and the protection and treatment of remains throughout construction and O&M activities.

Mitigation Measure CR-21: Treatment of P-16-000143 Human Remains

If avoidance of P-16-000143 is not feasible, the Project applicant shall consult with the MLD prior to construction to determine the proper treatment of human remains at the site, which may include but is not limited to removal and reburial in an area of the property that would not be subject to further ground disturbance or reburial at a location on tribal lands and/or placing a cap over the grave site to prevent soil erosion and exposure of remains.

Mitigation Measure CR-22: Unidentified Human Remains

In the event that additional prehistoric human remains are identified during the implementation of mitigation measure CR-1 or any Project-related ground disturbance, the location of the remains shall be avoided. If avoidance is not feasible, treatment of the remains shall be determined in consultation with the MLD and in coordination with the Burial Protection and Treatment Plan. The Santa Rosa Rancheria Tribe of Tachi Yokut Indians is the MLD for Kings County.

Significance Determination after Mitigation

Less than significant.

Impact CR-5 Impact Tribal Cultural Resources

Construction, Operations, and Maintenance

All Facilities

Any specific impacts would be addressed as the Project is executed. The entirety of the Project area is known to be highly sensitive for prehistoric archaeological resources because much of it is occupied by what was once the shore of Tulare Lake and because the Project vicinity contains numerous previously-recorded archaeological resources, including some with human remains. Tulare Lake was once a significant settlement area and it is possible that resources in the Project vicinity may be considered tribal cultural resources (TCRs) by the local Tribes. O&M activities are unlikely to impact TCRs.

Significance Determination before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure CR-23: Consult with California Native Americans.

In the event that archaeological resources of Native American origin are identified during Project construction or the implementation of measures CR-1, CR-3, CR-4, or CR-6, the qualified archaeologist performing the cultural resources study would consult with the Project proponent and Semitropic to begin or continue Native American consultation procedures. If, as a result of the consultation, Semitropic determines that the resource is a tribal cultural resource, additional measures to avoid or reduce impacts to the resource may be required.

Significance Determination after Mitigation

Less than significant.

Cumulative Impacts

The geographic scope of cumulative impacts on cultural resources encompasses the study area, which includes the portion of Kings County within the vicinity of Kettleman City and the Tulare Lake bed. Several relevant present and future projects are under construction or in the planning phase that are in proximity to the proposed Project, including:

- Quay Valley Community Development - a new 7,175-acre community to be developed in south Kings County.
- Kettleman Hills Facility Expansion - expanding the existing B-18 Landfill and construct a new B-20 Landfill for hazardous waste and designated waste disposal.
- Kettleman City Surface Water Treatment Plant and Commercial Water Storage Tanks (Treatment Plant) – construction of a new surface water treatment plant to treat surface water for potable supply.
- Southwest Groundwater Banking Project – development of a project to divert and store floodwater from the Kings River and local stormwater.
- JID Distributed Recharge Bypass and Lassen Projects – improvement to and construction of recharge facilities to divert and store floodwater from the Kings River.
- Terranova On-Farm Flood Capture and McMullin Recharge Site – improvements to and construction of facilities to divert floodwater from the Kings River for recharge on existing farm lands.

Of these projects, the first three listed above have the potential to cumulatively adversely affect cultural resources by uncovering and/or damaging artifacts or burial sites during construction. The three other projects are located in Fresno County, outside the Tulare Lake bed area. Potential cumulative impacts related to cultural resources are, however, generally site-specific and depend on conditions. Other cultural-related impacts resulting from construction and/or operation of these related projects are expected to be similar to those anticipated for the proposed Project, and as such, there are no anticipated cumulative impacts associated with the proposed Project and the projects listed above assuming the implementation of construction best management practices and use of similar mitigation measures (e.g. use of a cultural resource monitor during construction) at all sites.

3.7 Geology, Soils, and Seismicity

This section presents the physical and regulatory setting for geology and soils for the proposed Project. The impact analysis evaluates potential adverse impacts of the Project related to local geology, existing soil conditions, or seismicity, and is based on a review of geologic maps and reports, including geologic and geotechnical reports and information from state and local agencies, as well as geotechnical investigations prepared for the Project. The impact analysis is supported by the following document included in the appendices of this document, including Appendix F. Kettleman Reservoir Levee Breach Analysis Technical Memorandum, Appendix L. Earthwork Impacts, and preliminary data from geotechnical borings.

3.7.1 Environmental Setting

The following sections describe the environmental setting for geologic resources and hazards within the Project area, which includes the Project area and geologic features in the Project vicinity (such as faults) that could affect Project facilities.

Regional and Site Geology

The proposed Project is located within California's San Joaquin Valley, an area referred to as the Great Valley geomorphic province (CGS, 2002). The Great Valley province is roughly 50 miles wide and 400 miles long and runs down the middle of California (CGS, 2002). The Sacramento Valley, drained by the Sacramento River, forms the northern part of the province and the San Joaquin Valley, drained by the San Joaquin River, forms the southern portion (including most of Kings County). The southern part of the Valley (including the Project area) is internally draining, with the tributaries of Kings, Tule, Kern, and Kaweah Rivers and Cross Creek flowing into the Tulare Lake Bed. The southern portion of the Great Valley is bounded by the Coast Ranges to the west, the San Emigdio and Tehachapi Ranges to the south, and the foothills of the Sierra Nevada to the east. The Great Valley region largely consists of Quaternary deposits from the Pleistocene and Holocene epochs. These deposits are largely non-marine consolidated and unconsolidated alluvium, lake, playa, and terrace deposits that have been accumulating over millions of years (CGS, 2010). Historically, this area was part of Tulare Lake, a low elevation point in the Tulare Lake Bed and the receiving area for the drainages from the Kings, Kaweah, Tule, and Kern Rivers along with sediments. During the warmer and drier climatic conditions over the past 11,000 years (the Holocene Epoch), water levels in the lakes receded and the lakes became seasonal lakes or playas (Kings County, 2009). In the late nineteenth century, the lakes were drained to establish areas of agricultural production.

The sediments in the Great Valley include marine, alluvial, and lacustrine (lake) deposits. The Project area is composed predominately of marine rocks ranging in age from pre-Tertiary to Eocene (Kings County, 2010i). The alluvial sediments include relatively coarse-grained deposits along river channels and are relatively resistant to erosion, forming low hills, such as the Kettleman Hills, in the southwestern portion of Kings County (Kings County, 2010i). The geologic structure in the subsurface produced by folding and faulting and the presence of significant petroleum source rocks and suitable reservoir rocks has resulted in the development of numerous oil and gas fields within the southern San Joaquin Valley, including the Kettleman Hills, as discussed in more detail in *Chapter 3.13 Oil and Mineral Resources* (Kings County, 2009).

Known for its rich soils, the Project area has become a center for California's agricultural activities, consistently ranking in the top 10 most productive agricultural counties in California (CDFA, 2015). The topography of the region is very flat, which makes the area further suitable for agriculture and other farming activities (refer to *Chapter 3.3 Agriculture and Forestry Resources*).

Soils

Soil Characteristics

The National Resources Conservation Service uses a Capability Class system to distinguish soils that are most receptive to the production of field crops (NRCS, 2013). Using this system, soils are designated with a class number 1 through 8, based on limiting characteristics of the soils as follows:

Class 1 *Soils have few limitations that restrict their use.*

Class 2 *Soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.*

Class 3 *Soils have severe limitations that reduce the choice of plants, or that require special conservation practices, or both.*

Class 4 *Soils have very severe limitations that reduce the choice of plants, or that require very careful management, or both.*

Class 5 *Soils are not likely to erode but have other limitations, impractical to remove, that limit their use.*

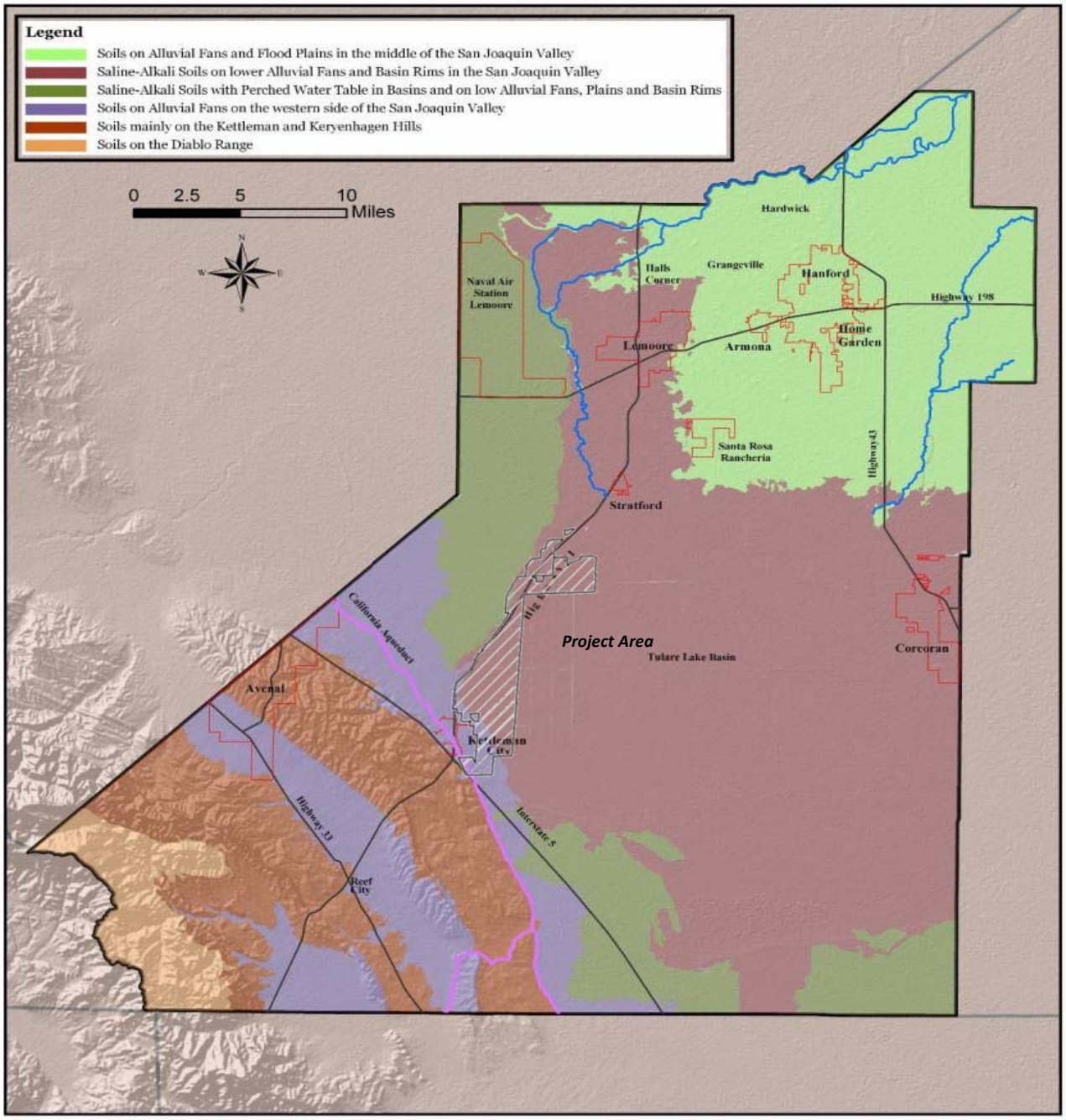
Class 6 *Soils have severe limitations that make them generally unsuitable for cultivation.*

Class 7 *Soils have very severe limitations that make them unsuitable for cultivation.*

Class 8 *Soils and landforms have limitations that nearly preclude their use for commercial crop production*

Soils in the Project area range from Capability Class 1 through Capability Class 4. Class 1 soils predominate in the Great Valley, supporting the area's extensive agricultural production. Class 4 soils are commonly limited by salt and calcite; these soils are often matched with salt-tolerant plants that can tolerate such conditions. Within the Project area there are two common soil associations generalized by depositional environment and Capability Class; the Lethent soil associations found on the lower alluvial fans (comprising the majority of soils in the Project area) and the clay-rich soil associations found in the flood plain and basins. These two soil associations are well suited to support drought-resistant plants and salt- and alkali-tolerant crops. The soils of the lower alluvial fans and floodplains within the Project area are mapped in **Figure 3.7-1**.

Figure 3.7-1: Generalized Soils in the Project Area



Source: Kings County General Plan, Resource Conservation Element,2010b.

Agricultural Soil Ratings

The California Revised Storie Index is a soil rating system based on soil properties that govern a soil's potential for cultivated agriculture in California. The Storie Index assesses the productivity of a soil based on the degree of soil profile development, texture of the surface layer, slope, and manageable features (NRCS, 2013). Storie Index ratings were previously scored between the numbers 0 to 100; however, for simplification, the Revised Storie Index ratings have been combined into six grades as follows;

Grade 1 *Excellent: Soils that rate between 80 and 100 and which are suitable for a wide range of crops.*

Grade 2 *Good: Soils that rate between 60 and 79 and which are suitable for a wide range of crops.*

Grade 3 *Fair: Soils that range between 40 and 59. Soils in this grade may give good results with certain specialized crops.*

Grade 4 *Poor: Soils that rate between 20 and 39 and which have a narrow range in their agricultural potential.*

Grade 5 *Very Poor: Soils that rate between 10 and 19 and are very poorly suited for agriculture, are seldom cultivated, and are more commonly used for range, pasture, or woodland.*

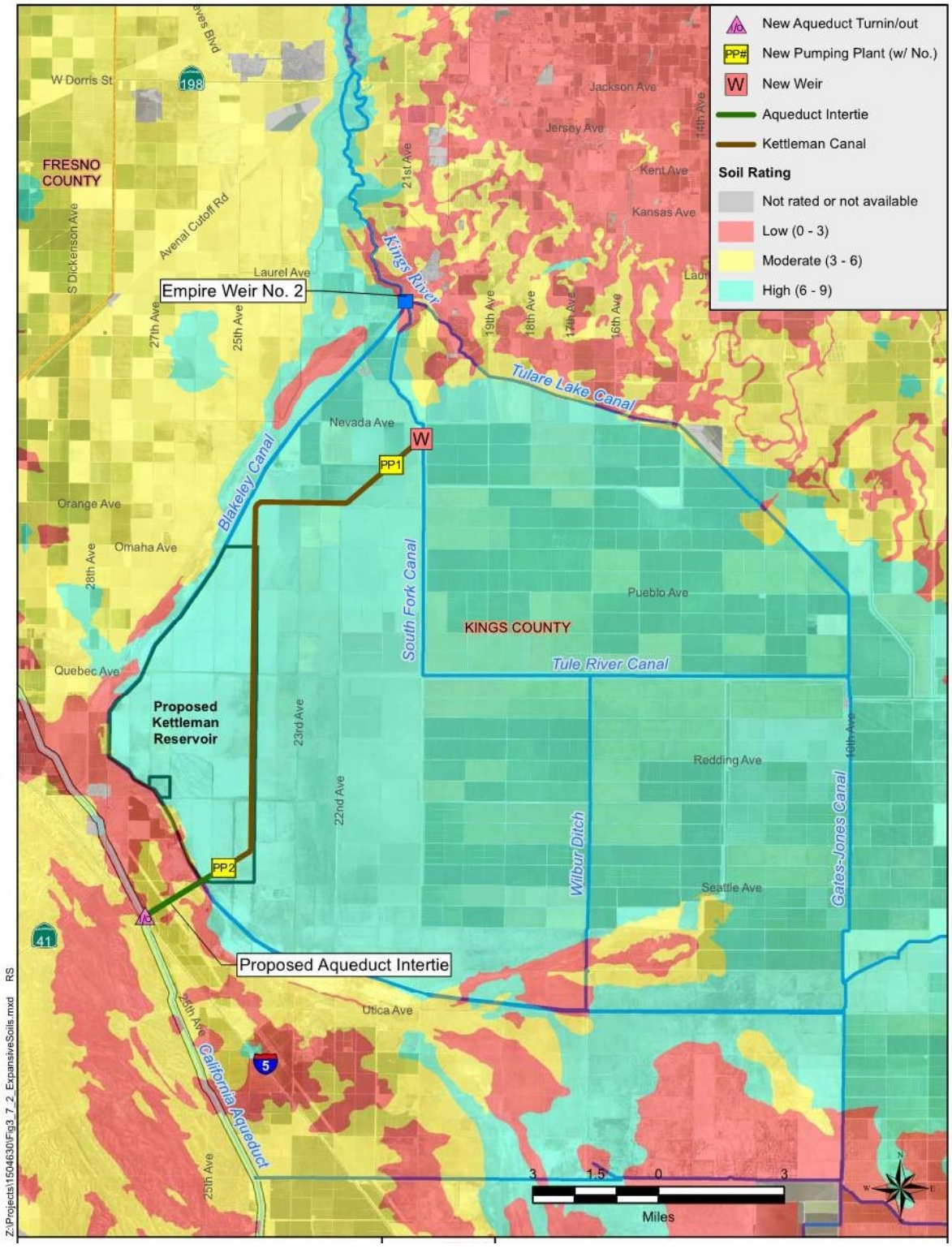
Grade 6 *Nonagricultural: Soils that rate less than 10.*

As defined in Government Code Section 51201 (California Land Conservation Act of 1965), Capability Class 1 and Class 2 soils and soils with a Storie Index from 80 to 100 (Grade 1/Excellent under the Revised rating) qualify as prime soils (NRCS, 2013). The Project area contains both Grade 1 and 2 (excellent – good) soils, as well as Grade 6 (nonagricultural) soils.

Potential for Expansive Soils

Expansive soils are soils capable of absorbing high amounts of water. As more water is absorbed by the soil, the soil begins to expand, thus potentially damaging structures, including pipelines. The majority of the soil in the Project area is characterized as clay with high expansive capacity, as shown in **Figure 3.7-2** (USGS 1989, Kings County, 2010b). Structures on expansive soils can be damaged because the soils swell in the wet season and shrink during the dry season.

Figure 3.7-2: Expansive Soils in the Project Area



Seismicity, Landslides, and Liquefaction

Earthquakes, Seismicity and Groundshaking

There are no known major fault systems within Kings County. Fault systems closest to the Project area which pose a threat of seismic activity in the area include the San Andreas Fault and Poso Creek Fault (see **Figure 3.7-3**). The San Andreas Fault, which has the greatest potential to seismically affect the Project area, is located approximately 25 miles southwest of the Project area. The Poso Creek Fault is located approximately 16 miles southeast of the Project area.

In the past 200 years, Kings County (including the Project area) has not experienced any damage from earthquakes equal to or greater than a Mercalli Index (M) VI (Kings County, 2010b). The largest earthquake to occur in recent history near the Project area was the along the White Wolf fault in 1952, during the Kern County earthquake. Although the epicenter of this earthquake was 38 miles southeast of the Kings County boundary (near Bakersfield), the groundshaking produced was felt over 200 miles away (Kings County, 2010b).

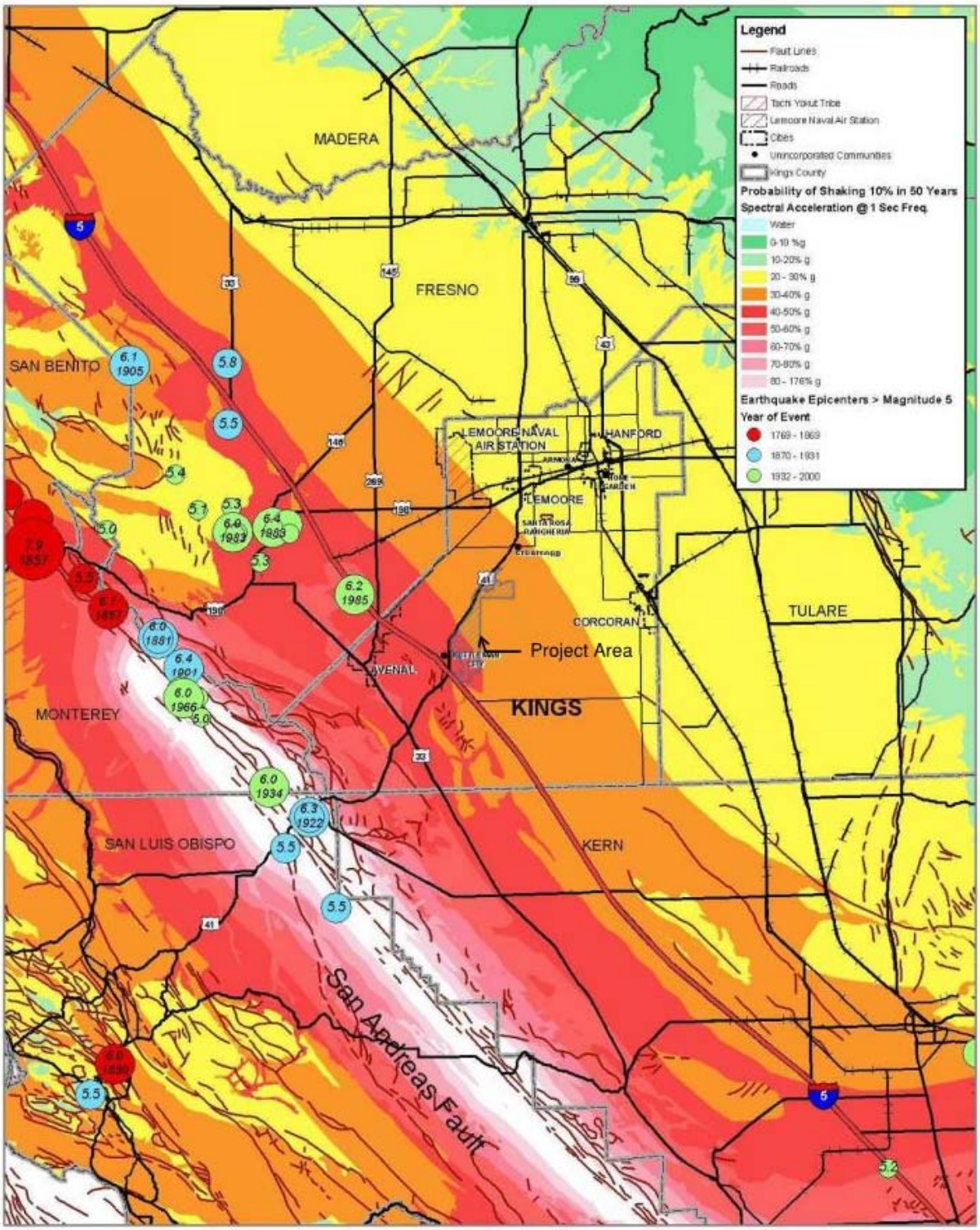
The most recent earthquakes to impact Kings County occurred during the 1980's, and included the 1982 New Idria earthquake (M 5.4) and the 1983 Coalinga (M 6.5) earthquake (Kings County, 2010b). Both earthquakes occurred along the San Andreas Fault, approximately 25 miles southwest of the Project. These two earthquakes were followed by the 1985 Kettleman Hills earthquake (M 6.1) with an epicenter located four miles west of the Kings County border, just north of the City of Avenal (Kings County, 2010b). All three of these earthquake incidents produced low level ground shaking and low local magnitude in Kings County, as expected (Kings County, 2010b).

The primary hazard of seismic activity in Kings County results from groundshaking. Strong ground motions can worsen existing unstable slope conditions, particularly if coupled with saturated ground conditions. Earthquake hazards are most severe in the southwestern-third of Kings County (where the Project site is located), where the potential for peak ground acceleration (% g) ranges up to 30-50% g (Kings County, 2010b). The Project area is located in Seismic Zone 2, which is projected to have amplification of shaking that would affect low to medium rise structures, and is located a "moderate" distance from the San Andreas Fault zone (Kings County, 2010b). The combined effect is that shaking is expected to be minimal (Kings County, 2010b).

The Modified Mercalli Intensity scale (MMI) is commonly used to measure earthquake intensity due to groundshaking.

Table 3.7-1 presents a description of the MMI scale and its relation to peak ground acceleration values, as described above. The MMI values for intensity range from I (earthquake not felt) to XII (damage nearly total). MMI intensities ranging from IV to X can cause moderate to significant structural damage, although the damage may not be uniform in that some structures may experience substantially more damage than others. The age, material, type, method of construction, size, and shape of a structure affect its performance in an earthquake.

Figure 3.7-3: Active Faults within Project Area



Source: Kings County, Health and Safety Element, 2010a.

Table 3.7-1: Modified Mercalli Intensity Scale

Intensity Value (MMI)	Intensity Description	Average Peak Acceleration (% g[1])
I	Not felt except by a very few persons under especially favorable circumstances.	< 0. 17
II	Felt only by a few persons at rest, especially on upper floors on buildings. Delicately suspended objects may swing.	0.17–1.4
III	Felt noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing motor cars may rock slightly, vibration similar to a passing truck.	0.17–1.4
IV	During the day felt indoors by many, outdoors by few. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.	1.4–3.9
V	Felt by nearly everyone, many awakened. Some dishes and windows broken; a few instances of cracked plaster; unstable objects overturned. Disturbances of trees, poles may be noticed. Pendulum clocks may stop.	3.5–9.2
VI	Felt by all, many frightened and run outdoors. Some heavy furniture moved; and fallen plaster or damaged chimneys. Damage slight.	9.2–18
VII	Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving.	18–34
VIII	Damage slight in specially designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving motor cars disturbed.	34–65
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked. Underground pipes broken.	65–124
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from riverbanks and steep slopes. Shifted sand and mud. Water splashed over banks.	> 124
XI	Few, if any, masonry structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.	> 124
XII	Damage total. Practically all works of construction are damaged greatly or destroyed. Waves seen on ground surface. Lines of sight and level are distorted. Objects are thrown upward into the air.	> 124

Source: ABAG, 2013

1. g (gravity) = 980 cm/seconds^2. 1.0 g of acceleration is a rate of increase in speed equivalent to a car traveling 328 feet from rest in 4.5 seconds.

The 1974 Five County Seismic Safety Element divided Kings County into different Seismic Zones to categorize the intensity of ground motion that could be reasonably anticipated if an earthquake affected Kings County. The Project area includes two Seismic Zone groups, Valley Zone (V) V2 and V4. These zones are located along the valley floor with high near-surface amplification, as described in **Table 3.7-2**.

Table 3.7-2: Project Area Seismic Zone Description

Seismic Zone	Project Components in the Zone	Generalized Geologic Formation	Amplification of Shaking
V2	Kettleman Reservoir, Blakeley Canal, South Fork Canal, Empire Weir No. 2	Moderately thick section of marine and continental sedimentary deposits overlying granitic basement complex.	Amplification of shaking that would affect low to medium-rise structures is low and the distance to the San Andreas fault zone is moderate. The combined effect is shaking that is expected to be minimal.
V4	Kettleman Reservoir, Blakeley Canal	Thick section of consolidated sedimentary units overlain by thick unconsolidated alluvial fan deposits.	Amplification of shaking is reduced by the damping effect of the thick sedimentary section, but its moderately close proximity to the San Andreas fault zone results in the expectation of moderately high shaking characteristics.

Source: 1974 Five County Seismic Safety Element

Landslides

Although numerous types of earthquake-induced landslides have been identified, the most widespread type generally consists of shallow failures involving surface soils and the uppermost weathered bedrock in moderate to steep hillside terrain. Rock falls and rock slides on very steep slopes are also common. While there are areas west of Interstate 5 that are susceptible to landslides, the Project area is relatively flat and therefore the risk of landslides is negligible (CGS, 2015).

Kings County is ranked as having low to moderate risk of landslides. Although landslides are primarily associated with steep slopes, they may also occur in areas of generally low relief and as cut-and-fill failures, river bluff failures, lateral spreading landslides, collapse of mine waste piles, and failures associated with quarries and open-pit mines (Kings County, 2010b). The entire Project area is located in an area defined as having "Low" (less than 1.5 percent of area involved) probability of a landslide incident (Kings County, 2010b).

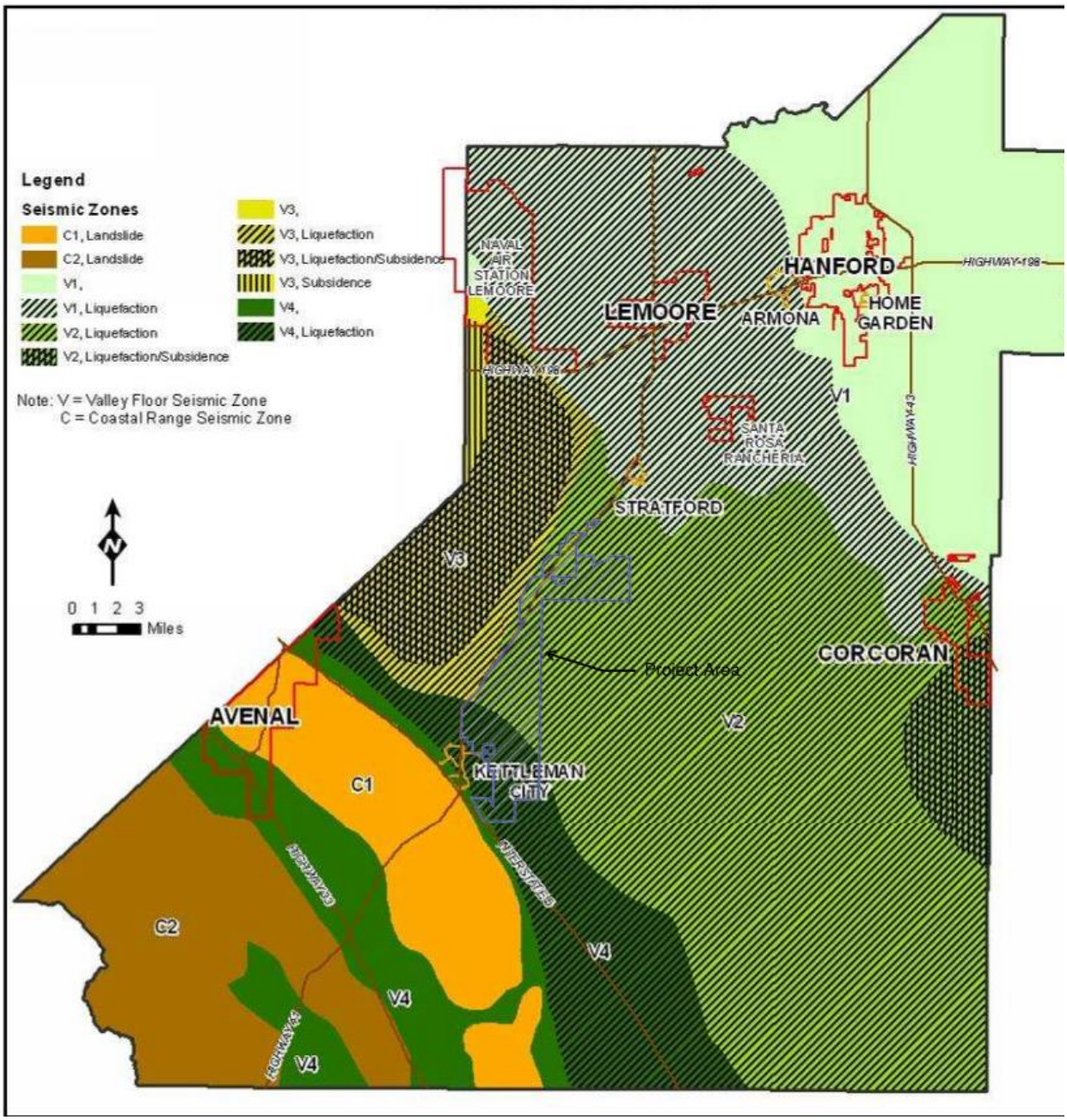
Liquefaction

Liquefaction typically occurs in loose, saturated sediments consisting primarily of sandy composition in the presence of ground accelerations caused by earthquakes. When liquefaction occurs, the sediments involved have a total or substantial loss of shear strength and behave like a liquid or semi-viscous substance. If liquefaction occurs, overlying structures, such as pipelines, may tip or become buoyant and float upwards. Three general conditions must be met for liquefaction to occur: (1) strong seismic groundshaking of relatively long duration; (2) loose, or unconsolidated, recently deposited sediments consisting primarily of silty-sand and sand; and (3) water-saturated sediments within about 50 feet of the surface (Kings County, 2010b). While no specific liquefaction hazards have been identified in Kings County, certain locations within the Project area may be susceptible to liquefaction due to higher water tables and unconsolidated,

granular soils (Kings County, 2010b). Areas with sandy, saturated soils, such as the areas adjacent to the Kings River, may be at increased risk for liquefaction.

The Kettleman Reservoir would be located in Zone V4, which (as shown in **Figure 3.7-4**) could experience moderately high groundshaking and is at a higher risk of liquefaction than Project facilities located in Zone V2. However, given the three requirements for liquefaction to occur and the distance from the San Andreas fault, the overall the risk and danger of liquefaction and subsidence occurring within the Project area is considered to be low (Kings County, 2010b).

Figure 3.7-4: Seismic Risk in Project Area



Source: Kings County Health and Safety Element, 2010a

3.7.2 Regulatory Framework

This section describes laws and regulations at the federal, state, and local level that may apply to the Project.

Federal Policies and Regulations

There are no federal policies or programs associated with geology and soils that would apply to the proposed Project.

State Policies and Regulations

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures used for human occupancy. In accordance with this act, the state geologist established regulatory zones, called "earthquake fault zones," around the surface traces of active faults and has published maps showing these zones. Within these zones, buildings used for human occupancy cannot be constructed across the surface trace of active faults. In addition to delineating earthquake fault zones, the Act requires disclosure of properties located within an earthquake fault zone when buying or selling a property. Each earthquake fault zone extends approximately 200 to 500 feet on either side of the mapped fault trace because many active faults are complex and consist of more than one branch that may experience ground surface rupture (see **Figure 3.7-3** for proximity of the Project area to existing faults). The proposed Project is not located within a Fault-Rupture Hazard Zone designated by the Alquist-Priolo Earthquake Fault Zoning Act.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was passed in 1990 following the Loma Prieta earthquake to reduce threats to public health and safety and to minimize property damage caused by earthquakes. The Act directs the Department of Conservation to identify and map areas prone to the earthquake hazards of liquefaction, earthquake-induced landslides, and amplified groundshaking. For structures intended for human occupancy, the act requires site-specific geotechnical investigations to identify potential seismic hazards and formulate mitigation measures prior to permitting most developments designed for human occupancy within the Zones of Required Investigation. The California Geologic Survey seismic hazards map for the Project area shows that the Project is not in a liquefaction hazard zone (CGS, 2015).

California Building Code

The California Building Code (CBC), which is codified in CCR Title 24, Part 2, was promulgated to safeguard the public health, safety, and general welfare by establishing minimum standards related to structural strength, egress facilities, and general building stability. The purpose of the CBC is to regulate and control the design, construction, quality of materials, use/occupancy, location, and maintenance of all buildings and structures within its jurisdiction. Title 24 is administered by the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under state law, all building standards must be centralized in Title 24 or they are not enforceable.

The CBC is based on the International Building Code. The 2007 CBC is based on the 2006 International Building Code published by the International Code Conference. In addition, the CBC contains necessary California amendments that are based on the American Society of Civil Engineers (ASCE) Minimum Design Standards 7-05. ASCE 7-05 provides requirements for general structural design and includes means for determining earthquake loads as well as other loads (flood, snow, wind) for inclusion in building codes. The provisions of the CBC apply to the construction, alteration, movement, replacement, and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures throughout California.

The earthquake design requirements take into account the occupancy category of the structure, site class, soil classifications, and various seismic coefficients, all of which are used to determine a Seismic Design Category (SDC) for a project. The SDC is a classification system that combines the occupancy categories with the level of expected ground motions at the site and ranges from SDC A (very small seismic vulnerability) to SDC E/F (very high seismic vulnerability and near a major fault). Design specifications are then determined according to the SDC. Compliance with the CBC would be necessary for the new pipelines and pump stations, electrical switchyard and substation, maintenance yard structures and possibly for certain grading activities in the Project area.

Local Policies and Regulations

Kings County Multi-Jurisdiction Multi-Hazard Mitigation Plan (HMP)

The Kings County HMP was developed under the guidance of the Kings County Fire Department/Kings County Emergency Operations to reduce natural hazard vulnerability and make communities in Kings County more disaster resistant and sustainable. The HMP identifies natural hazards that threaten communities, determines the most likely impacts of those hazards, sets mitigation goals, and develops strategies that may be prioritized and implemented to reduce impacts. The HMP serves as a guide and coordination strategy to implement mitigation activities. The HMP identifies potential natural hazards in Kings County, as summarized below in **Table 3.7-3**.

Table 3.7-3: Potential Natural Hazards in Project Area

Hazard	Probability of Occurrence	Spatial Extent	Potential Magnitude	Significance
Earthquake	Occasional	Significant	Critical	High
Landslide	Occasional	Limited	Negligible	Low
Soil Hazard: Expansive, Liquefaction, Erosion	Unlikely	Limited	Negligible	Low

Kings County General Plan

The Kings County Health and Safety Element of the General Plan (Kings County, 2010b) identifies natural hazards applicable to the County and establishes policies to prevent and mitigate potential hazards. The Health and Safety Element includes the following goals relative to the geology and soils in the Project area:

- *HS Goal A1:* Preventative measures reduce the potential impacts of natural hazards upon people's lives, property, and the environment.
- *HS Objective A1.3:* Limit growth and development in hazard areas to minimize new areas susceptible to higher risk of natural hazards.
- *HS Policy A1.4.1:* Implement the current California Building Codes and any subsequent amendments as contained within California Code of Regulations Title 24 to improve disaster resistance of future buildings.
- *HS Goal A2:* Minimize loss of life and personal property caused by geologic hazards.
- *HS Objective A2.1:* Regulate new construction to achieve acceptable levels of risk posed by geologic hazards.
- *HS Policy A2.1.1:* Maintain and enforce current building codes and standards to reduce the potential for structural failure caused by ground shaking and other geologic hazards.

The Kings County Resource Conservation Element (Kings County, 2010i) identifies natural resources throughout the County and establishes policies for the conservation of resources, such as soils. The Resource Conservation Element includes the following goals relative to the geology and soils of the area:

- *RC Objective C1.1:* Conserve prime agricultural soils, and avoid their conversion to nonagricultural uses.
- *RC Policy C1.1.2:* Evaluate the effects of the loss of agricultural soils related to discretionary land use approvals for non-agricultural uses that are allowed in agriculturally zoned land.

3.7.3 Impact Analysis

Methodology for Analysis

Potential impacts on geology, soils, and seismicity are analyzed based on the potential for the proposed Project's construction or operations to create adverse situations for this resource area. Specifically, this section evaluates whether construction and operation of the facilities associated with the proposed Project would result in significant impacts related to local geology, geologic hazards, existing soil conditions, or seismicity.

Thresholds of Significance

For the purposes of this analysis, an impact related to geology, soils and seismicity would be significant if the Project would:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
  - 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;
  - Strong seismic groundshaking;
  - Seismic-related ground failure, including liquefaction; or
  - Landslides.
- Be located on expansive soil, as defined in Table 18-1-B of the 1994 Uniform Building Code (UBC), creating substantial risks to life or property; or
- 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-site or offsite landslide, lateral spreading, subsidence (i.e., settlement), liquefaction, or collapse;
- Result in substantial soil erosion or the loss of topsoil;
- Increase salinity of topsoil;
- 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.

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to actions associated with the Project are identified below along with a supporting rationale as to why further consideration is unnecessary and a no impact determination is appropriate.

- *Rupture of a Known Earthquake Fault* – The Project is not located within a Fault-Rupture Hazard Zone designated by the Alquist-Priolo Earthquake Fault Zoning Act of 1972 and there are no known active faults in the immediate vicinity (Hart, 1997). The two nearest active faults are the San Andreas

and Poso Creek faults, which are located approximately 25 and 16 miles away, respectively (CGS, 2015). Because there are no known faults in the Project vicinity, there would be no impact associated with the rupture of a known earthquake fault.

- *Landslides* – The Project area is located on a valley floor and is relatively flat. As such, the Project is not located on or adjacent to a hillside, exposed rock face, or cliff. According to CGS, the Project is in the lowest class for susceptibility to landslides; and the nearest landslide hazard zone lies over 100 miles from the Project (CGS, 2011). Therefore, there would be no Project impacts related to risk of loss, injury, or death involving landslides.
- *Soils Incapable of Adequately Supporting the Use of Septic Tanks or Alternative Wastewater Disposal Systems* – The Project would not generate wastewater and would not require the installation of septic tanks or alternative wastewater disposal systems. Therefore, there would be no impacts related to adequate support of septic tanks or alternative wastewater disposal systems.

Impacts and Mitigation Measures

This section discusses potential impacts to geology, soils and seismicity that could result from construction and operation of the Project. Mitigation measures are identified where appropriate.

Impact GEO-1 Expose People or Structures to Potential Substantial Adverse Effects, including the Risk of Loss, Injury, or Death Involving Strong Seismic Groundshaking

Construction, Operation, and Maintenance

Storage Facilities

Most structures, including buildings and pipelines, are subject to damage from earthquakes. The intensity of such an event would depend on which fault the earthquake occurs, the distance of the epicenter from the Project, the duration of shaking, and structure-specific characteristics. While the Project is not located within a Fault-Rupture Hazard Zone designated by the Alquist-Priolo Earthquake Fault Zoning Act, there are two active faults within 25 miles of the Project area; San Andreas (25 miles west of the Kettleman Reservoir) and Poso Creek Fault (16 miles southeast of the Kettleman Reservoir), as shown in **Figure 3.7-3**. The Kettleman Reservoir is at risk for high peak ground acceleration (up to 50% g) (Kings County, 2010b), which could cause groundshaking of an intensity approaching 6.0 on the Modified Mercalli Scale. This level of groundshaking has potential to cause slight damage in specifically designed structures and great damage in poorly built structures.

The *Kings County General Plan – Health and Safety Element* (2010) also classifies the southern area of the storage facility as Valley Floor Seismic Zone V4 land and the northernmost portion of the reservoir as Valley Floor Seismic Zone V2 (Kings County, 2010b). Land classified as Zone V4 is expected to experience moderately high groundshaking due to the proximity to the San Andreas Fault, despite dampening from thick sedimentary sequences in the area (Kings County, 2010b). Land classified as Zone V2 is expected to experience low groundshaking since the San Andreas Fault is over 25 miles away. Overall, the area within the Kettleman Reservoir has a low chance that amplification from shaking would affect the low to medium-rise levee structures (Kings County, 2010b).

Groundshaking has potential to cause structural damage to the storage facility and levees which could result in levee failure and flooding of nearby areas. Flooding due to a failed levee is only a concern while the reservoir is in use (approximately every three out of ten years). As indicated in the Kettleman Reservoir Levee Breech Analysis (GEI, 2017g – see Appendix F.), flows resulting from a levee breech are expected to travel east of the Kettleman Reservoir towards agricultural land, not communities, and are not expected to expose people to injury or death. See *Section 3-10, Hydrology and Water Quality* for a more detailed analysis of effects of flooding on the surrounding area.

Due to the Project'sdistance from active faults, the expected intensity of groundshaking is not severe, and through compliance with the CBC and implementation of **Mitigation Measure GEO-1**, potential seismic-related impacts would be reduced to a less than significant level.

Conveyance Facilities

The Project's conveyance facilities would include improvements to Empire Weir No. 2 and the South Fork Canal, and construction of the Kettleman Canal, Kettleman Pumping Plants #1 and #2, and Aqueduct Intertie. As mentioned previously, there are no active faults in the Project Area; however, due to the geology of the area and distance from the San Andreas Fault, the land proposed for construction of the California Aqueduct Intertie is classified as Zone V4 in the *Kings County General Plan – Health and Safety Element.* Zone V4 classified land is at risk for moderately high groundshaking as a result of a rupture along the San Andreas Fault, though amplification risk is reduced due to the thick sedimentary geology in the zone (Kings County, 2010b). The southern portions of the project area are at risk of groundshaking at a level of up to a M 6.0 on the MMI scale, mainly due to the proximity to the San Andreas Fault, while the central and northern portions of the project area have a lower risk of damage from groundshaking. Improvements to Empire Weir No. 2 would occur on land classified as V1, which would be minimally affected by groundshaking. Improvements made to the Blakeley Canal, South Fork Canal and the construction of the Kettleman Canal would occur on land ranging in classification from V1 to the north (minimum risk of groundshaking), V2 in the central portions, and V4 to the south (greatest risk of groundshaking).

Although groundshaking is expected to be noticeable and universally felt, damage to facilities is expected to be minimal due to the distance from active faults in the area. In addition, implementation of **Mitigation Measure GEO-1** would reduce the risk of damage from groundshaking to a level of less than significant.

Other Facilities

Other Project facilities include pumping plants, maintenance yard, and electrical switchyard and substation. Based on zone designations in the Kings County General Plan – Health and Safety Element, the construction of the Project's other facilities would occur in a Zone V4 designation, consistent with Project's conveyance and storage facilities and would operate in an area with a risk of an earthquake of up to M 6.0. Infrastructure would be exposed to the risks of groundshaking, but the level of risk would be reduced to a less than significant level through implementation of **Mitigation Measure GEO-1.**

Significance Determination before Mitigation

Potentially significant.

Mitigation Measures

The following measures are applicable to the Project's construction and operational periods:

Mitigation Measure GEO-1: Implement Recommendations Outlined in Design-Level Geotechnical Evaluations for Seismic Hazards

During the design phase for the proposed Project, perform site-specific, design-level geotechnical evaluations to identify potential secondary ground failure hazards (i.e., seismically-induced settlement) associated with the expected level of seismic groundshaking. A geotechnical memorandum shall be prepared to detail the findings of the evaluations. The geotechnical memorandum would provide recommendations for the final Project design that would mitigate those hazards. The design-level geotechnical evaluations, based on site conditions, location, and professional opinion of the geotechnical engineer, may include subsurface drilling, soil testing, and analysis of site seismic response to determine appropriate and feasible measures to be incorporated into the Project design. The performance standard to be used in the geotechnical evaluations would be minimization of the hazards associated with liquefaction and seismic groundshaking. The geotechnical engineer would review the seismic design criteria of facilities

to ensure that facilities are designed to withstand the highest expected peak acceleration, set forth by the CBC for each site, and ensure that secondary ground failures, such as liquefaction, are minimized. Recommendations resulting from findings of the geotechnical study would be incorporated into the design and construction of the Project's proposed facilities.

Significance Determination after Mitigation

Less than significant.

Impact GEO-2 Risk to Property and Life from Expansive Soils

Construction, Operation, and Maintenance

Storage Facilities

The Kettleman Reservoir site is in an area underlain with lacustrine and marsh deposits; sediments that likely contain expansive soils. Expansive soils exhibit clay-like characteristics since they swell when wetted and shrink when dried, which could damage levee foundations or impact stability. In addition, reservoir levees would be constructed using soils excavated during construction of the reservoir, which could be expansive as well because periodic filling of the reservoir could trigger shrinking and swelling.

In order to reduce impacts associated with constructing the storage reservoir in an area rich in expansive soils, detailed geotechnical studies are required prior to construction to evaluate the potential for geologic and soil hazards. These conditions must be minimized or corrected during construction. The analyses would provide recommendations to prepare sites for development to avoid the hazards associated with expansive soils, as described in **Mitigation Measure GEO-2**. Typical measures to treat expansive soils involve removal, proper fill selection, and compaction. Expansive soils should not be a substantial constraint to development of individual sites provided that adequate soil and foundation studies are performed prior to construction and that CBC guidelines are followed. Therefore, implementation of **Mitigation Measure GEO-2** would mitigate these impacts to a level of less than significant.

Conveyance Facilities

As shown in **Figure 3.7-2,** the Aqueduct Intertie structures and Empire Weir No. 2 are not located within an area with expansive soils, therefore, there are no impacts associated with construction of the parallel pipelines and associated appurtenances, aqueduct turn-in/turn-out structure, or improvements made to the weir that would increase risk to property or life due to expansive soils. The Blakeley Canal, South Fork Canal, and Kettleman Canal are in an area with expansive soils, but both the Blakeley Canal and South Fork Canal are existing facilities and the improvements associated with the Project are not expected to increase hazards from expansive soils. Implementation of **Mitigation Measure GEO-2** would reduce this impact a level of less than significant.

Other Facilities

The Project's other facilities (including the electrical switchyard and substation, maintenance yard, and internal pumping plants) are in an area composed of highly expansive soils. However, implementation of **Mitigation Measure GEO-2** would reduce this impact to a level of less than significant.

Significance Determination before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure GEO-2: Implement Recommendations Outlined in Design-Level Geotechnical Evaluations for Expansive Soils

During the design phase for all components of the Project, a design-level geotechnical evaluation would be prepared to determine the presence and characteristics of potentially compressible and expansive soils, the engineering properties of the foundation material, and the depth and thickness of soil layers. The results of the evaluation would include measures that would reduce the effects of soil expansion to a less-than-significant level. Feasible mitigation measures could include removal and replacement of soil, construction of deep foundations, or deep mixing of compressible or expansive soils with stabilizing agents to ensure that expansive soils are not used as construction materials. All mitigation measures included in the geotechnical evaluation would be incorporated into the Project design specifications.

Significance Determination after Mitigation

Less than significant.

Impact GEO-3 Facility Damage and Exposure of People to Hazards from Liquefaction and Lateral Spreading

Construction, Operation, Maintenance

Storage Facilities

The Kettleman Reservoir would be located in Zone V4, which could experience moderately high groundshaking in an earthquake centered on the San Andreas fault, and is considered to have a risk of liquefaction that is mitigatable through design (Kings County, 2010b). As such, liquefaction impacts are considered to be potentially significant. Implementation of **Mitigation Measure GEO-3** would ensure that facilities are designed to minimize liquefaction hazards, which would reduce this impact to a less-than-significant level.

Conveyance Facilities

Construction related to the Project's conveyance facilities would occur on soil that is considered not to be susceptible to liquefaction (such as the South Fork Canal in Zones V1 and V2), with some facilities located on soil and in areas where the potential for liquefaction may exist (such as the Aqueduct Intertie facilities in Zones V4). Implementation of **Mitigation Measure GEO-3** would ensure that conveyance facilities are designed to minimize liquefaction hazards, which would reduce this impact to a less-than-significant level.

Other Facilities

The electrical switchyard and substation, maintenance yard, and Kettleman Pumping Plant #2 would be constructed in a Zone V4, which is susceptible to liquefaction. Implementation of **Mitigation Measure GEO-3** would reduce this impact to a less-than-significant level by ensuring that facilities are designed to minimize the risk of liquefaction.

Significance Determination before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure GEO-3: Implement Recommendations Outlined in Design-Level Geotechnical Evaluations for Liquefaction and Other Geologic Hazards

During the design phase for storage, conveyance, and other facilities, a site-specific design-level geotechnical evaluation would be performed to identify geologic hazards and provide recommendations to mitigate those hazards in the final design and during construction. For specific elements that have previously been subject to a geotechnical investigation, a geotechnical memorandum shall be prepared to update the previous investigation.

The design-level geotechnical evaluations would include the collection of subsurface data for determining liquefaction potential, and appropriate and feasible measures would be developed and incorporated into the Project design. The performance standard to be used in the geotechnical evaluations for mitigating liquefaction hazards would be minimization of the hazards. Measures to minimize significant liquefaction hazards could include the following, unless the site-specific soils analyses dictate otherwise:

- Densification or dewatering of surface or subsurface soils
- Construction of pile or pier foundations to support pipelines and/or buildings
- Removal of material that could undergo liquefaction in the event of an earthquake, and replacement with stable material.

Significance Determination after Mitigation

Less than significant.

Impact GEO-4 Potential for Substantial Erosion or Loss of Top Soil

Construction

Project construction would require the removal of on-site groundcover and vegetation, and the grading of lands. With the loss of this vegetation, surface soils would be exposed to wind and surface water flows, which raises the potential for erosion. Moreover, trenching associated with construction of new canals would lead to substantial soil exposure. These impacts would be potentially significant depending upon the amount and extent of erosion.

Any project involving grading of an area greater than 1 acre is required to apply for a NPDES permit from the CVRWQCB. This permit requires the preparation and implementation of a Stormwater Pollution Prevention Plan. A BMP program, as required by CVRWQCB, would be prepared and implemented as part of the SWPPP. Since some construction activities would not be restricted to the dry months of the year, erosion control BMPs would be implemented to ensure that sediment is confined to the construction area and not transported off-site.

Implementation of the stormwater pollution-control BMPs identified in the SWPPP, compliance with adopted regulations and policies, and use of appropriate sloping, shoring, and bracing techniques, as well as covering or stabilizing topsoil stockpiles, would reduce soil erosion impacts to a less-than-significant level, and therefore, no mitigation beyond compliance with these measures is required.

Storage Facilities

Project construction activities would include clearing, grubbing, grading, excavation, trenching and soil stockpiling using a cut-and-fill operation. The Kettleman Reservoir would be constructed by grading and excavating approximately 10,893,037 cubic yards of soils, which would be stockpiled and used onsite to construct levees, pump station earthen pads, and reservoir embankments.. Such activities, if not properly managed, have the potential to cause erosion and/or loss of top soil in the Project area. Erosion could result

in sedimentation and affect water quality in the nearby surface water bodies. Water within the California Aqueduct and South Fork and Blakeley Canals would potentially be impacted by this erosion.

Improper management of soils during construction activities could also reduce the capacity of agriculturally-viable soils. As discussed aboveError! Reference source not found., most soils in the Project area are suitable for agriculture, therefore, there is significant potential to lose agriculturally-valuable top soil during construction. However, all soil materials would be managed on site per construction best management practices, and because topsoil would be stored and replaced appropriately after construction (e.g. within the interior cells of the Kettleman Reservoir), topsoil would not be permanently lost from the Project area. Therefore, this impact is considered less than significant.

Conveyance Facilities

As shown below in **Table 3.7-4**, construction of all conveyance facilities would require the excavation of over 2,960,000 cubic yards of soil. The majority of excavated soil would be used for construction of the Kettleman Canal. Improvements made to the South Fork Canal and Empire Weir No. 2 are not anticipated to disrupt substantial amounts of soil.

Table 3.7-4: Soils Excavated during Conveyance Facilities Construction

Conveyance Facility	Soil Excavated (cy)	Compacted Backfill (cy)	Total Excavated Material Used in Backfill (cy)	Balance (cy)	Soil Reuse Description
Empire Weir No. 2	2,000	500	650	1,350	Reuse at the canal site or at other locations within the Project area
South Fork Canal Diversion	17,976	2,580	3,354	14,622	Construct levees within Kettleman Reservoir. Reuse at canal site or at other Project area locations
Kettleman Pumping Plant #1	25,685	2,168	2,818	22,867	Used to grade surface, additional reuse at pumping plant location or other Project area locations
Kettleman Canal	2,211,932	1,434,419	1,864,745	347,187	Construct levees within Kettleman Reservoir. Reuse at canal site or at other Project area locations
Kettleman Pumping Plant #2	20,729	14,265	18,544	2,185	Used to grade surface, additional reuse at pumping plant location or other Project area locations

Conveyance Facility	Soil Excavated (cy)	Compacted Backfill (cy)	Total Excavated Material Used in Backfill (cy)	Balance (cy)	Soil Reuse Description
Aqueduct Intertie Parallel Pipelines	668,844	43,124	576,061	92,783	Reuse for trench backfill.
Aqueduct Intertie Turn-in/Turn-out	16,273	10,788	14,024	2,249	Reuse along the pipeline alignment or at other Project area locations
Total Soil Excavated	**2,963,439**				

All soil excavated for construction would be reused elsewhere on-site, and topsoil would be stored and replaced appropriate after construction. Construction therefore would not result in the loss of topsoil, and compliance with construction best management practices would minimize the potential for erosion. Therefore, this impact is considered less than significant.

Other Facilities

Construction of other Project facilities, including the pumping plants, maintenance yard, and electrical switchyard and substation are not anticipated to disrupt large quantities of soil. These Project facilities would use soils excavated from other Project facilities (conveyance or storage facilities) to establish a preliminary grade for forming concrete slabs and foundations for permanent structures associated with the pumping plants, electrical switchyard and substation, and maintenance yard. Impacts are considered less than significant and no mitigation is required beyond compliance with construction best management practices.

Operations & Maintenance

Storage Facilities

During the Project's operational phase, storage of floodwaters within the Kettleman Reservoir would potentially result in periodic loss of soil as a result of wave run-up or erosion during reservoir draining. However, the filling and emptying of the Kettleman Reservoir would occur at rates designed to minimize erosion and the potential for impacts to levees. Embankments would be sloped 6:1 on the windward side and 3:1 on the exterior side in a design to minimize embankment erosion. Additionally, erosion would be prevented through periodic slope reinforcement via maintenance activities to grade the embankment slopes and tops of the reservoir.

During periods when the Kettleman Reservoir is not in operation, dry grazing and other related agricultural operations would be allowed within the reservoir. The prior inundation of the reservoir, followed by dry years, would promote the growth of grasses and other vegetation which would, in turn, support dry grazing. This vegetation would anchor soils within the reservoir and minimize wind-related erosion in non-operational years. These lands would continue to be managed as agricultural lands in a manner similar to current practices and, as such, would result in impacts considered to be less than significant.

Conveyance Facilities

Improvements made to the South Fork Canal and Empire Weir No. 2 would not increase potential for erosion as operation would occur within existing channels in such a manner as to minimize erosion. Similarly, operation of the Kettleman Canal would occur within the new channel, and would not be expected to cause erosion because operational flow rates would be designed to minimize erosion. Impacts are considered less than significant.

Other Facilities

Other Project facilities, including the electrical switchyard and substation and maintenance yard, would be graded and stabilized using crushed graveled bases within fenced enclosures. Facility design would minimize the potential for either water or wind-related erosion, and therefore impacts are considered less than significant.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required beyond compliance with construction best management practices.

Impact GEO-5 Salinization of Soils

Construction

All Facilities

Construction of the facilities would entail excavation, grading, trenching and levee/embankment construction. During the two-year construction period, construction activities would not lead to increased flooding and drying cycles, and therefore would not increase evaporation and salt build up on native soils. Therefore, salinity of soils would not increase due to construction activities and there are no anticipated impacts.

Operations & Maintenance

Storage Facilities

When in operation, storage of floodwaters within the Kettleman Reservoir would occur, on average, in three out of ten years. Because soils in the area are affected by salt, intervals of flooding and drying within the reservoir could lead to salt build up in native soils, which could affect the potential to grow native grasses and other grazing plants. Saline soils are typically characterized by white or light brown crusts on the surface (Provin and Pitt, 2016). Saline soils restrict the amount of water available to plants and, depending on the plant species, can cause plant death. Salinity is of greatest concern in soils that are poorly drained because salt accumulation leads to increased evaporation (Provin and Pitt, 2016). Soils within the reservoir are characterized by very slow permeability and a shallow, perched water table (at a depth of 2.5 to 6 feet), indicating concern for salt build-up through evaporation.

Salt-affected soils can be modified to improve soil quality via a variety of methods, such as improving drainage, leaching, evaporation reduction, or application of chemical treatments (Provin and Pitt, 2016). Although leaching is typically the best method used to control salt build-up, other methods include crop rotation, subsurface drains, and soil amendments. In the event that soils become salinized due to the periodic flooding/drying intervals in the Kettleman Reservoir, maintenance activities, including the implementation of **Mitigation Measure GEO-4** would reduce impacts to less than significant.

Conveyance Facilities

Operation and maintenance of the Kettleman Pumping Plant #1 and #2, Aqueduct Intertie (pumping plant, three parallel pipelines, turn-in/turn-out structures), Blakeley Canal, and Empire Weir No. 2 would not lead to increased salinity as soil would not be exposed to flooding intervals. However, the operation of the Kettleman Canal (an earthen trapezoidal channel) could lead to salt accumulation due to increased evaporation. Implementation of **Mitigation Measure GEO-4** would reduce impacts to less than significant.

Other Facilities

The O&M of the Project's other facilities would not result lead to increased salinization of soils as no flooding cycles would occur on these facilities. Therefore, there are no impacts associated with the operation of these facilities.

Significance Determination before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure GEO-4: Develop Soil Salinity Management Approach

Prior to beginning Project operations Semitropic will develop an approach to monitor soils in the Kettleman Reservoir and Kettleman Canal for salt accumulation and identify a range of potential management actions that could be implemented if soil salt concentrations were to reach levels such that plant growth in the reservoir was impacted. Should soils become salinized due to the periodic flooding/drying intervals in the Kettleman Reservoir or Canal, facility operators would work to improve soil quality through the implementation of previously-identified alternatives, based on salinity levels and site location. Management actions that could be implemented include introducing organic material (such as cattle manure) into shallow soils in the impacted areas or by tilling compacted layers that occur near or at the soil surface to break up the soils.

Significance Determination after Mitigation

Less than significant.

Cumulative Impacts

The geographic scope of potential cumulative impacts related to geology and soils encompasses the Project area and immediate vicinity. There are six relevant projects within the immediate vicinity of the proposed Project that may contribute to cumulative impacts:

- Quay Valley Community Development - a new 7,175-acre community to be developed in south Kings County.
- Kettleman Hills Facility Expansion - expanding the existing B-18 Landfill and construct a new B-20 Landfill for hazardous waste and designated waste disposal.
- Kettleman City Surface Water Treatment Plant and Commercial Water Storage Tanks (Treatment Plant) – construction of a new surface water treatment plant to treat surface water for potable supply.
- Southwest Groundwater Banking Project – development of a project to divert and store floodwater from the Kings River and local stormwater.
- JID Distributed Recharge Bypass and Lassen Projects – improvement to and construction of recharge facilities to divert and store floodwater from the Kings River.
- Terranova On-Farm Flood Capture and McMullin Recharge Site – improvements to and construction of facilities to divert floodwater from the Kings River for recharge on existing farm lands.

Potential cumulative impacts related to geology, seismicity, and soils are generally site-specific and depend on local geologic and soil conditions. Other geology- and seismic-related impacts resulting from construction and/or operation of these related projects are expected to be similar to those anticipated for the proposed Project, and as such, there are no anticipated cumulative impacts associated with the proposed Project and the projects listed above assuming the implementation of construction best management practices at all sites.

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3.8 Greenhouse Gas Emissions and Climate Change

This section analyzes greenhouse gas (GHG) emissions associated with the proposed Project and potential impacts related to climate change.

3.8.1 Environmental Setting

Climate Change and Greenhouse Gases

Gases that absorb and re-emit infrared radiation in the atmosphere are called greenhouse gases (GHGs). The GHGs that are widely seen as the principal contributors to human-induced climate change include carbon dioxide (CO_2), methane (CH_4), nitrous oxides (N_2O), fluorinated gases such as hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Water vapor is excluded from the list of GHGs because it is short-lived in the atmosphere and its atmospheric concentrations are primarily determined by natural processes, such as oceanic evaporation.

GHGs are emitted by both natural processes and human activities. Of these gases, CO_2, CH_4, and N_2O are emitted in the greatest quantities from human activities. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas CH_4 results from off-gassing associated with agricultural practices and landfills. N_2O is produced by microbial processes in soil and water, including those reactions that occur in fertilizers that contain nitrogen, fossil fuel combustion, and other chemical processes.

Man-made GHGs, many of which have greater heat-absorption potential than CO_2, include fluorinated gases and SF_6 (California Environmental Protection Agency [CalEPA] 2006). Different types of GHGs have varying global warming potentials (GWPs). The GWP of a GHG is the potential of a gas or aerosol to trap heat in the atmosphere over a specified timescale (generally, 100 years). Because GHGs absorb different amounts of heat, a common reference gas (CO_2) is used to relate the amount of heat absorbed to the amount of the gas emissions, referred to as "carbon dioxide equivalent" (CO_2e), and is the amount of a GHG emitted multiplied by its GWP. Carbon dioxide has a 100-year GWP of one. By contrast, methane has a GWP of 25, meaning its global warming effect is 25 times greater than carbon dioxide on a molecule-per-molecule basis (IPCC, 2007).

Greenhouse Gas Emissions Inventories

Federal Emissions Inventory

Total U.S. GHG emissions were 6,586.7 million metric tons (MMT or gigatonne) CO_2e in 2015 (USEPA, 2017). Total U.S. emissions have increased by 3.5 percent since 1990. However, emissions decreased by 2.3 percent from 2014 to 2015 (USEPA 2017). The decrease from 2014 to 2015 was a result of multiple factors, including: (1) substitution from coal to natural gas consumption in the electric power sector, (2) warmer winter conditions in 2015 resulting in a decreased demand for heating fuel in the residential and commercial sectors, and (3) a slight decrease in electricity demand (USEPA, 2017). Since 1990, U.S. emissions have increased at an average annual rate of 0.2 percent. In 2015, the industrial and transportation end-use sectors accounted for 29 percent and 27 percent of CO_2 emissions (with electricity-related emissions distributed), respectively. Meanwhile, the residential and commercial end-use sectors accounted for 16 percent and 17 percent of CO_2 emissions, respectively (USEPA, 2017).

California Emissions Inventory

Based on the California Air Resources Board (CARB) California Greenhouse Gas Inventory for 2000-2014, California produced 441.5 MMT CO_2e in 2014 (CARB, 2016c). The largest single source of GHG in California is transportation, contributing 37 percent of the state's total GHG emissions. Industrial sources

are the second-largest source of the state's GHG emissions, contributing 24 percent of the state's GHG emissions (CARB, 2016c). California emissions are due in part to its large size and large population compared to other states. However, the state's mild climate reduces California's per capita fuel use and GHG emissions as compared to other states. CARB has projected statewide unregulated GHG emissions for the year 2020 will be 509.4 MMT CO_2e (CARB, 2016c). These projections represent the emissions that would be expected to occur in the absence of any GHG reduction actions.

Potential Effects of Climate Change

Globally, climate change has the potential to affect numerous environmental resources through potential impacts related to future air temperatures and precipitation patterns. Scientific modeling predicts that continued GHG emissions at or above current rates would induce more extreme climate changes during the 21st century than were observed during the 20th century. Long-term trends have found that each of the past three decades has been warmer than all the previous decades in the instrumental record, and the decade from 2000 through 2010 has been the warmest. The global combined land and ocean temperature data show an increase of about 0.89°C (0.69°C to 1.08°C) over the period 1901 to 2012, and about 0.72°C (0.49°C to 0.89°C) over the period 1951 to 2012 when described by a linear trend. Several independently analyzed data records of global and regional Land-Surface Air Temperature (LSAT) obtained from station observations are in agreement that LSAT as well as sea surface temperatures have increased. In addition to these findings, there are identifiable signs that global warming is currently taking place, including substantial ice loss in the Arctic over the past two decades (IPCC 2014).

Potential impacts of climate change in California may include loss in snow pack, sea level rise, more extreme heat days per year, more high-ozone days, more large forest fires, and more drought years (CalEPA 2010). Below is a summary of some of the potential effects that could be experienced in California as a result of climate change.

Air Quality

Higher temperatures, which are conducive to air pollution formation, could worsen air quality in California. Climate change may increase the concentration of ground-level ozone, but the magnitude of the effect, and therefore its indirect effects, are uncertain. If higher temperatures are accompanied by drier conditions, the potential for large wildfires could increase, which, in turn, would further worsen air quality. However, if higher temperatures are accompanied by wetter rather than drier conditions, the rains would tend to temporarily clear the air of particulate pollution and reduce the incidence of large wildfires, thereby ameliorating the pollution associated with wildfires. Additionally, severe heat accompanied by drier conditions and poor air quality could increase the number of heat-related deaths, illnesses, and asthma attacks throughout the state (CEC, 2009a).

Water Supply

Analysis of paleoclimatic data (such as tree-ring reconstructions of stream flow and precipitation) indicates a history of naturally and widely varying hydrologic conditions in California and the west, including a pattern of recurring and extended droughts. Uncertainty remains with respect to the overall impact of climate change on future water supplies in California. However, the average early spring snowpack in the Sierra Nevada decreased by about 10 percent during the last century, a loss of 1.5 million acre-feet of snowpack storage. During the same period, sea level rose eight inches along California's coast. California's temperature has risen 1°F, mostly at night and during the winter, with higher elevations experiencing the highest increase. Many Southern California cities have experienced their lowest recorded annual precipitation twice within the past decade. In a span of two years, Los Angeles experienced both its driest and wettest years on record (California Department of Water Resources [DWR] 2008, California Climate Change Center [CCCC] 2009).

This uncertainty complicates the analysis of future water demand, especially where the relationship between climate change and its potential effect on water demand is not well understood. The Sierra snowpack provides the majority of California's water supply by accumulating snow during the state's wet winters and releasing it slowly during the state's dry springs and summers. Based on historical data and modeling, the DWR projects that the Sierra snowpack will experience a 25 to 40 percent reduction from its historic average by 2050. Climate change is also anticipated to bring warmer storms that result in less snowfall at lower elevations, reducing the total snowpack (DWR 2008).

Hydrology and Sea Level Rise

As discussed above, climate change could potentially affect the amount of snowfall, rainfall, and snow pack; the intensity and frequency of storms; flood hydrographs (flash floods, rain or snow events, coincidental high tide and high runoff events); sea level rise and coastal flooding; coastal erosion; and the potential for saltwater intrusion. According to *The Impacts of Sea-Level Rise on the California Coast* (CCCC 2009), climate change has the potential to induce substantial sea level rise in the coming century. The rising sea level increases the likelihood and risk of flooding. The rate of increase of global mean sea levels over the 2001 to 2010 decade, as observed by satellites, ocean buoys, and land gauges, was approximately 3.2 mm per year, which is double the observed 20th century trend of 1.6 mm per year (World Meteorological Organization [WMO] 2013). As a result, sea levels averaged over the last decade were about 8 inches higher than those of 1880 (WMO 2013). Sea levels are rising faster now than in the previous two millennia, and the rise is expected to accelerate, even with robust GHG emission control measures. The most recent IPCC report (2013) predicts a mean sea level rise of 11 to 38 inches by 2100. This prediction is more than 50 percent higher than earlier projections of 7 to 23 inches when comparing the same emissions scenarios and time periods. A rise in sea levels could result in coastal flooding and erosion, and could jeopardize California's water supply due to saltwater intrusion. In addition, increased CO_2 emissions can cause oceans to acidify due to the carbonic acid it forms. Increased storm intensity and frequency could affect the ability of flood-control facilities, including levees, to handle storm events.

Agriculture

California has a $30 billion annual agricultural industry that produces approximately half of the country's fruits and vegetables. Higher CO_2 levels can stimulate plant production and increase plant water-use efficiency. However, if temperatures rise and drier conditions prevail, water demand could increase, crop-yield could be threatened by a less reliable water supply, and greater air pollution could render plants more susceptible to pest and disease outbreaks. In addition, temperature increases could change the time of year certain crops, such as wine grapes, bloom or ripen, and thereby affect their quality (CCCC 2006).

Ecosystems and Wildlife

Climate change and the potential resulting changes in weather patterns could have ecological effects on a global, regional, and local scale. Increasing concentrations of GHGs are likely to accelerate the rate of climate change. Scientists project that the average global surface temperature could rise by 1.0 to 4.5°F (0.6 to 2.5°C) in the next 50 years, and 2.2 to 10°F (1.4 to 5.8°C) in the next century, with substantial regional variation. Soil moisture is likely to decline in many regions, and intense rainstorms are likely to become more frequent. Rising temperatures could have four major impacts on plants and animals:

- Timing of ecological events
- Geographic range
- Species' composition within communities
- Ecosystem processes, such as carbon cycling and storage (Parmesan 2006)

3.8.2 Regulatory Framework

Federal Regulations

The U.S. Supreme Court in *Massachusetts et al. v. Environmental Protection Agency et al*. ([2007] 549 U.S. 05-1120) held that the USEPA has the authority to regulate motor-vehicle GHG emissions under the federal Clean Air Act. The USEPA issued a Final Rule for mandatory reporting of GHG emissions in October 2009. This Final Rule applies to fossil fuel suppliers, industrial gas suppliers, direct GHG emitters, and manufacturers of heavy-duty and off-road vehicles and vehicle engines, and requires annual reporting of emissions. In 2012, the USEPA issued a Final Rule that establishes the GHG permitting thresholds that determine when Clean Air Act permits under the New Source Review Prevention of Significant Deterioration (PSD) and Title V Operating Permit programs are required for new and existing industrial facilities.

In 2014, the U.S. Supreme Court in *Utility Air Regulatory Group v. EPA* (134 S. Ct. 2427 [2014]) held that USEPA may not treat GHGs as an air pollutant for purposes of determining whether a source is a major source required to obtain a PSD or Title V permit. The Court also held that PSD permits that are otherwise required (based on emissions of other pollutants) may continue to require limitations on GHG emissions based on the application of Best Available Control Technology (BACT).

State Regulations

CARB is responsible for the coordination and oversight of State and local air pollution control programs in California. California has a numerous regulations aimed at reducing the state's GHG emissions. These initiatives are summarized below.

California Advanced Clean Cars Program

Assembly Bill (AB) 1493 (2002), California's Advanced Clean Cars program (referred to as "Pavley"), requires CARB to develop and adopt regulations to achieve "the maximum feasible and cost-effective reduction of GHG emissions from motor vehicles." On June 30, 2009, the USEPA granted the waiver of Clean Air Act preemption to California for its greenhouse gas emission standards for motor vehicles beginning with the 2009 model year. Pavley I regulates model years from 2009 to 2016 and Pavley II, which is now referred to as "LEV (Low Emission Vehicle) III GHG", regulates model years from 2017 to 2025. The Advanced Clean Cars program coordinates the goals of the Low Emissions Vehicles (LEV), Zero Emissions Vehicles (ZEV), and Clean Fuels Outlet programs, and would provide major reductions in GHG emissions. By 2025, when the rules will be fully implemented, new automobiles will emit 34 percent fewer GHGs and 75 percent fewer smog-forming emissions from their model year 2016 levels (CARB, 2011).

Assembly Bill 32

California's major initiative for reducing GHG emissions is outlined in Assembly Bill 32, the "California Global Warming Solutions Act of 2006," signed into law in 2006. AB 32 codifies the statewide goal of reducing GHG emissions to 1990 levels by 2020, and requires CARB to prepare a Scoping Plan that outlines the main State strategies for reducing GHGs to meet the 2020 deadline. In addition, AB 32 requires CARB to adopt regulations to require reporting and verification of statewide GHG emissions. Based on this guidance, CARB approved a 1990 statewide GHG level and 2020 limit of 427 MMT CO_2e. The Scoping Plan was approved by CARB on December 11, 2008, and included measures to address GHG emission reduction strategies related to energy efficiency, water use, and recycling and solid waste, among other measures. Many of the GHG reduction measures included in the Scoping Plan (e.g., Low Carbon Fuel Standard, Advanced Clean Car standards, and Cap-and-Trade) have been adopted since approval of the Scoping Plan.

In May 2014, CARB approved the first update to the AB 32 Scoping Plan. The 2013 Scoping Plan update defines CARB's climate change priorities for the next five years and sets the groundwork to reach post-2020 statewide goals. The update highlights California's progress toward meeting the "near-term" 2020 GHG emission reduction goals defined in the original Scoping Plan. It also evaluates how to align the State's longer-term GHG reduction strategies with other State policy priorities, such as for water, waste, natural resources, clean energy and transportation, and land use (CARB, 2014).

Executive Order B-30-15

Executive Order (EO) B-30-15 established a Statewide mid-term GHG reduction target of 40 percent below 1990 levels by 2030. Targets set beyond 2020 provide market certainty to foster investment and growth in industries like clean energy.

Senate Bill 97

Senate Bill (SB) 97, signed in August 2007, acknowledges that climate change is an environmental issue that requires analysis in California Environmental Quality Act (CEQA) documents. In March 2010, the California Resources Agency (Resources Agency) adopted amendments to the State CEQA Guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions. The adopted guidelines give lead agencies the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHG and climate change impacts.

Senate Bill 375

Senate Bill 375, signed in August 2008, enhances the State's ability to reach AB 32 goals by directing CARB to develop regional GHG emission reduction targets to be achieved from passenger vehicles for 2020 and 2035. In addition, SB 375 directs each of the state's 18 major Metropolitan Planning Organizations (MPO) to prepare a "sustainable communities strategy" (SCS) that contains a growth strategy to meet these emission targets for inclusion in the Regional Transportation Plan (RTP). On September 23, 2010, CARB adopted final regional targets for reducing GHG emissions from 2005 levels by 2020 and 2035. San Joaquin Valley's Metropolitan Planning Organizations was assigned GHG emissions targets of a 5 percent per capita reduction for the year 2020 and a 10 percent per capita reduction for the year 2035 (CARB, 2013).

Senate Bill 32

On September 8, 2016, the governor signed Senate Bill 32 into law, extending AB 32 by requiring the State to further reduce GHGs to 40 percent below 1990 levels by 2030 (the other provisions of AB 32 remain unchanged). SB 32 became effective on January 1, 2017 and now codifies the 2030 goal set in EO B-30-15. This requires CARB to develop technologically feasible and cost-effective regulations to achieve the targeted 40 percent GHG emission reduction. CARB is currently working to update the Scoping Plan to provide a framework for achieving the 2030 target, and the updated Scoping Plan is expected to be completed and adopted by CARB in 2017 (CARB, 2017). The Scoping Plan update calls for emissions reductions at the State level that meet or exceed the Statewide GHG target, and notes that additional effort will be needed to maintain and continue GHG reductions to meet the mid- (2030) and long-term (2050) targets.

For more information on the Senate and Assembly bills, executive orders, and reports discussed above, and to view reports and research referenced above, please refer to the following websites: www.climatechange.ca.gov and www.arb.ca.gov/cc/cc.htm.

California Environmental Quality Act

Pursuant to the requirements of SB 97, the Resources Agency has adopted amendments to the *State CEQA Guidelines* for the feasible mitigation of GHG emissions or the effects of GHG emissions. The adopted *State CEQA Guidelines* provide general regulatory guidance on the analysis and mitigation of GHG emissions in CEQA documents, while giving lead agencies the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHGs and climate change impacts. To date, a variety of air districts have adopted quantitative significance thresholds for GHGs.

3.8.3 Impact Analysis

Methodology for Analysis

The vast majority of individual projects do not generate sufficient GHG emissions to directly influence climate change. However, physical changes caused by a project can contribute incrementally to cumulative effects that are significant, even if individual changes resulting from a project are limited. The issue of climate change typically involves an analysis of whether a project's contribution towards an impact would be cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects (CEQA Guidelines, Section 15064[h][1]). GHG emissions and climate change are, by definition, cumulative impacts as they affect the accumulation of greenhouse gases in the atmosphere. Therefore, the impact analysis for the Project encompasses both a project-level and cumulative analysis.

In late 2015, the California Supreme Court's Newhall Ranch decision confirmed that there are multiple potential pathways for evaluating GHG emissions consistent with CEQA, depending on the circumstances of a given project (*Center for Biological Diversity v. Department of Fish and Wildlife* (2015) 62 Cal. 4th 204; see also, *Cleveland National Forest Foundation v. SANDAG* (2017) 2017 WL 2980146). The decision also identified the need to analyze both near-term and post-2020 emissions, as applicable, stating that an "EIR taking a goal-consistency approach to CEQA significance may in the near future need to consider the project's effects on meeting longer-term emissions reduction targets." While not legally binding on local land use agencies, SB 32 extends the statewide AB 32 reduction goal, requiring the State to further reduce GHGs to 40 percent below 1990 levels by 2030, and Executive Order (EO) S-03-05 has set forth a long-term reduction target to reduce GHG emissions in California by 80 percent below 1990 levels by the year 2050. SB 32 codifies the 2030 goal; however, the 2050 goal set forth by EO S-03-05 is not a codified goal. The 2050 goal assumes the development and implementation of new low-carbon technology and fuels. Therefore, assessment of current development projects against the 2050 goal would be speculative.

While the State has adopted the AB 32 Scoping Plan and multiple regulations to achieve the AB 32 year 2020 target, there is no currently adopted State plan to meet post-2020 GHG reduction goals. CARB is currently working to update the Scoping Plan to provide a framework for achieving the 2030 target set forth by SB 32 (CARB, 2015). As a result, State reduction strategies cannot be applied to the project to achieve long-term reductions. Achieving these long-term GHG reduction policies will require State and federal plans and policies for achieving post-2020 reduction goals. Placing the entire burden of meeting long-term reduction targets on local government or individual new development projects would be disproportionate and likely ineffective. Therefore, without further guidance on SB 32, such as an adopted Scoping Plan, projects with a horizon year of 2020 that is consistent with AB 32 would be considered on the trajectory for reaching the SB 32 target.

The San Joaquin Valley Air Pollution Control District (SJVAPCD) adopted a threshold of 29 percent reduction in GHG emissions relative to business-as-usual conditions (SJVAPCD 2015). However, this method is no longer recommended following the Newhall Ranch ruling. The California Air Pollution Control Officers Association (CAPCOA) recommended threshold of 10,000 MT CO_2e for stationary

sources was determined to be most appropriate for this project (CAPCOA 2008). The proposed Project is most similar to a stationary source because the Project is an infrastructural use, and the majority of the Project's emissions would occur onsite at the water storage facility.

Construction Emissions

Construction would generate temporary GHG emissions primarily due to the operation of construction equipment and truck hauling trips. Refer to *Section 3.4 Air Quality*, regarding project construction details. Site preparation and grading typically generate the greatest amount of emissions due to the use of grading equipment and soil hauling. CalEEMod was used to estimate emissions associated with the construction. Although construction activity is addressed in this analysis, CAPCOA does not discuss whether any suggested threshold approach adequately addresses impacts from temporary construction activity. As stated in CAPCOA's *CEQA and Climate Change* white paper, "more study is needed to make this assessment or to develop separate thresholds for construction activity" (CAPCOA 2008). Air districts throughout the State recommend amortizing GHG emissions from construction over the lifetime of a project and adding the annualized construction emissions to annual operating emissions. The Project is a major infrastructure development with an estimated minimum lifetime of 50 years. Therefore, construction emissions are annualized by amortization over a 50-year period and added to annual operating emissions in this analysis.

Operational Emissions

Operational emissions for energy use due to pumping were calculated using estimated electricity consumption and energy intensity factors for GHG emissions from PG&E, which are based on PG&E's total energy portfolio, including renewable sources of energy. The variance in PG&E's mix of electricity sources largely accounts for changes in PG&E's emission factors from year to year. The most recent CO_2 energy intensity factor is 427 lb CO_2 per MWh, based on PG&E's *Greenhouse Gas Emission Factors: Guidance for PG&E Customers* (2015a). Since PG&E's guidance document does not provide energy intensity factors for CH_4 or N_2O, energy intensity factors for these GHGs have been obtained from CalEEMod, which is based on 2013 PG&E energy portfolio data. The energy intensity factors for CH_4 and N_2O used in this analysis are 0.029 lb CH_4 per MWh and 0.006 lb N_2O per MWh (CalEEMod 2016). Energy intensity associated with each pump was provided by Semitropic. As described in *Section 3.10 Hydrology and Water Quality* of the Draft EIR, based upon the hydrological period evaluated (from 1977 to 2016), there are short and long-duration flooding events. Short flooding events are defined by those events having an average duration of 20 days, and long flooding events are defined by those events having an average duration of 140 days. Thus, the maximum energy consumed would be over 140 days during wet years, which occur approximately every three out of ten years. Therefore, assuming 24-hour operation for 140 days every three out of ten years, the annual average energy consumed would occur over approximately 42 days per year.

Thresholds of Significance

Based on Appendix G of the *State CEQA Guidelines*, impacts related to GHG emissions from the project would be significant if the project would do one or both of the following:

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

Impacts and Mitigation Measures

Impact GHG-1 Generate Greenhouse Gas Emissions, Either Directly or Indirectly, that May Have a Significant Impact on the Environment

Construction

All Facilities

As shown in **Table 3.8-1**, construction activity for the Project would generate an estimated total of 151,316 MT CO_2e over the 32-month construction period. When amortized over the estimated 50-year lifetime of the Project, construction would generate 3,026 MT CO_2e per year. As noted in *Section 3.4 Air Quality*, the majority of construction emissions would occur during 2020, and would be associated primarily with construction of the Kettleman Reservoir facilities.

Table 3.8-1: Estimated Construction Emissions of Greenhouse Gases

Year	GHG Emissions
2018	16,300 MT CO_2e/year
2019	55,350 MT CO_2e/year
2020	79,666 MT CO_2e/year
Total	151,316 MT CO_2e
Amortized over 50 years	**3,026 MT CO_2e/year**

See Appendix B for CalEEMod output.

Operations and Maintenance

All Facilities

Long-term GHG emissions relate to energy use from pumping. The generation of electricity through combustion of fossil fuels emits CO_2, and to a smaller extent, N_2O and CH_4. Annual electricity emissions are calculated using PG&E's energy intensity factors for GHGs. The Project has an estimated maximum total power of 48,113 kW. The maximum energy consumed would occur during long flooding events (140 days) during wet years, which occur every three out of ten years. As an annual average, the Project would operate approximately 42 days per year, based on these assumptions. This would result in an approximate average electricity consumption of 48,498 MWh annually. Based on the estimated electricity consumption and PG&E energy intensity factors, the Project would result in approximately 9,464 MT CO_2 per year associated with electricity consumption. However, this estimate uses current PG&E energy intensity factors, which are based on the State's existing portfolio of renewable and non-renewable energy sources. California's Renewables Portfolio Standard (RPS) pursuant to SB 1038, SB 1078, SB 1250, and SB 107 requires retail sellers of electricity to increase the amount of renewable energy they procure each year. Renewable energy is less GHG-intensive and would reduce energy intensity factors for utilities including PG&E. Therefore, as California's energy portfolio continues to shift to renewable energy sources, long-term GHG emissions associated with operation of the project would decrease.

The Project would also generate mobile emissions due to occasional maintenance vehicle trips. However, these trips would be infrequent and would not generate substantial mobile GHG emissions due to the project.

Energy Savings

The Project would generate energy savings by capturing flood flows and delivering the water to meet beneficial uses (e.g., direct irrigation demands) in Kings and Kern Counties, reducing reliance on more energy-intensive sources of water, such as native groundwater, that would otherwise need to be pumped or imported water from more distant locations such as the Delta. Additionally, the Project would divert flood flows that flood agricultural lands and potentially local disadvantaged communities under existing conditions.

The groundwater pumping savings associated with the Project have been estimated to be approximately 89,500 acre-feet (AF) of water per year, every three out of ten years, or approximately 26,850 AF of water per year, averaged annually. Based on an estimated average 350 feet of lift (average depth to groundwater as measured by Semitropic) and assuming an energy use factor of 1.02 kWh/AF/foot, the estimated energy savings would be 9,585,450 kWh per year averaged annually. This estimate does not account for the efficiency of a pump and motor together. Wire-to-water efficiency is the energy that is imparted to the water divided by the energy that came in over the electrical wires. Assuming a total wire-to-water efficiency of 70%, the total energy savings would be 13,693,500 kWh every three out of ten years, or 13,694 MWh per year. Based on PG&E energy intensity factors for CO_2, N_2O, and CH_4, operation of the proposed Project would provide a reduction of approximately 2,672 MT CO_2e per year.

Combined Construction and Operational Emissions

All Facilities

Table 3.8-2 combines the construction and operational GHG emissions associated with the proposed Project, which are offset by the energy savings (reduction in GHG emissions) of the Project. Net annual emissions would total approximately 9,818 MT CO_2e per year, and would not exceed the annual threshold of 10,000 MT CO_2e.

Table 3.8-2 Combined Annual Emissions

Emission Source	Annual GHG Emissions (MT CO_2e/year)
Construction	3,026
Operational	9,464
Total	**12,490**
Energy Reduction from Operation of Project	2,672
Net Emissions	**9,818**
Threshold	10,000
Threshold Exceeded?	**No**

See Appendix B for CalEEMod output.

Table 3.8-2 represents a conservative analysis of Project GHG emissions because operational GHG emissions, including energy reduction from operation of the Project, are based on 2013 energy intensity factors from PG&E. During 2013, 22% of PG&E's power was generated from renewable resources (PG&E 2015b). Based on PG&E's performance in 2013, the CO_2 emission factor was 0.194 MT CO_2/MWh. PG&E

is on track to achieve SB 350's target of 33% Renewable Portfolio Standard (RPS) in 2020 and 50% RPS in 2030. Based on this trajectory, the CO_2 energy intensity factor would be approximately 0.164 MT CO_2/MWh in 2020 and 0.124 MT CO_2/MWh in 2030. Using these estimated future year energy intensity factors would result in annual operational energy emissions of 8,016 MT CO_2e in 2020 and 6,086 MT CO_2e in 2030, which is a reduction of 15% and 36%, respectively, from the current 9,464 CO_2e per year.

As shown in **Table 3.8-2**, GHG emissions under existing-plus-Project conditions would not exceed the 10,000 MT CO_2e per year threshold. Furthermore, GHG emissions are expected to decrease each year to meet RPS targets for 2020 and 2030. Therefore, impacts to GHG emissions would be less than significant.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures required.

Impact GHG-2 Conflict with State GHG Reduction Goals or Any Applicable Plan, Policy, or Regulation Adopted for the Purpose of Reducing GHG Emissions.

Construction, Operations and Maintenance

All Facilities

As discussed in Section 3.7.2, *Regulatory Framework*, California has established a policy framework to reduce GHG emissions statewide through implementation of policies including AB 32. The 2013 Scoping Plan identifies GHG reduction strategies, focusing on energy, transportation, agriculture, water, waste management, and natural and working lands. Since GHG emissions from the water sector result primarily from energy used to pump, convey, treat, and heat water, GHG emissions reductions in the water sector would be achieved primarily by reducing electricity use (CARB, 2014). The Project's consistency with the six water sector GHG reduction measures are discussed below:

- **Measure W-1 (Water Use Efficiency):** The Project would capture flood flows but would not use water during operation of the facilities. Measure W-1 is not applicable to the Project.
- **Measure W-2 (Water Recycling):** As discussed in Measure W-1, the Project would not use water and therefore water recycling would not be a feasible option. Measure W-2 is not applicable to the Project.
- **Measure W-3 (Water System Energy Efficiency):** The Project would consume energy by moving water through recharge, storage, and conveyance facilities. At the point of diversion from the South Fork Canal, water would flow via gravity and be lifted via the proposed Kettleman Pumping Plant #1 into the proposed Kettleman canal for conveyance to Kettleman Pumping Plant #2. At this pumping plant, the water would be re-lifted through the Aqueduct Intertie and ultimately delivered to the California Aqueduct. A Preliminary Engineering Study Plan was completed for the Project. The Project would not operate in a fashion that would cause substantial wasteful, inefficient, and unnecessary consumption of energy. In addition, the Project would install pumps and conveyance infrastructure meeting the most current applicable efficiency standards. Furthermore, the Project would result in energy savings relative to existing conditions by capturing flood flows that would be used in lieu of native groundwater pumping and otherwise flood agricultural land, which would require removal by pumping.

- **Measure W-4 (Water Reuse Urban Runoff):** The Project is not a land use development project, and urban runoff would not be applicable to the Project since the site would permeable, natural surfaces where infiltration can readily occur. Measure W-4 is not applicable to the Project.
- **Measure W-5 (Increase Renewable Energy Production):** The Project would not produce energy on site. Measure W-5 is not applicable to the Project.
- **Measure W-6 (Public Good Charge):** This measure was intended to affect water prices on a statewide level rather than by individual water providers. Measure W-6 is not applicable to the Project.

The proposed Project would manage available waters by developing new surface water storage and conveyance facilities and utilizing existing facilities and groundwater conjunctive use capacity south of the Delta to provide for direct beneficial use and groundwater banking of floodwaters and surplus surface waters. The Project would result in energy savings relative to existing conditions by capturing flood flows that would be used in lieu of native groundwater pumping and otherwise flood agricultural land which would require removal by pumping. This Project would be consistent with the Scoping Plan's applicable water/energy-related emission reduction measures, as discussed above. The Project would not operate in a fashion that would cause substantial wasteful, inefficient, and unnecessary consumption of energy. In addition, the Project would install pumps and conveyance infrastructure meeting the most current applicable efficiency standards. Therefore, the Project would be an investment in efficient infrastructure for water resources, which is consistent with CARB's Scoping Plan.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Cumulative Impacts

As discussed in the Methodology for Analysis, GHG emissions and climate change are by definition cumulative impacts, as they affect the accumulation of greenhouse gases in the atmosphere. The proposed Project would be consistent with applicable land use and zoning designations and would be consistent with applicable State plans and programs designed to reduce GHG emissions. In addition, as shown in **Table 3.8-2**, GHG emissions associated with the proposed Project would not exceed the applicable 10,000 MT CO_2e per year GHG significance threshold. Furthermore, the Project would support the State with adapting to climate change by developing new surface water storage and conveyance facilities that capture and promote the beneficial use of floodwater. By utilizing existing facilities and groundwater conjunctive use capacity south of the Delta, the Project would provide direct beneficial use and groundwater banking of floodwaters and surplus surface waters. This is a necessary improvement to mitigate the impacts of climate change on water supply reliability by providing for conservation and storage of precipitation, especially during extreme flooding events, which are expected to increase in frequency and intensity due to climate change. As climate changes, the State needs to adapt to climate change by improving water management resilience to account for warmer temperatures and declining snowpack. The new infrastructure would help manage water supply variability, thereby stabilizing water reliability in high demand areas with limited water supply. Therefore, the Project would provide long-term benefits to adapt to climate change, and the Project's GHG emissions would not be cumulatively considerable.

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3.9 Hazards and Hazardous Materials

The following section describes the environmental setting for hazards and hazardous materials in the Project area, including the Project site and adjacent areas that could be affected by the use or presence of hazardous materials. The California Health and Safety Code defines hazardous materials as a material that because of its "quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment" (Section 25501(o)). Potential hazards addressed in this section include the use of hazardous materials during Project operation, the mobilization of or exposure of workers to existing hazardous materials in soils and groundwater, and potential releases of hazardous materials during construction. The impact analysis evaluates anticipated hazardous materials and hazards-related impacts to public health or the environment that would result from construction or operation of the Project.

3.9.1 Environmental Setting

The proposed Project is located in unincorporated Kings County, outside of the jurisdictional areas of the nearby cities. The nearest cities include Kettleman City, located approximately 0.5 mile southwest of the southern portion of the Project area, and Stratford, located approximately 0.5 mile north of the northern portion of the Project area. The following section describes the results of a records search conducted for the Project area to evaluate the potential for hazardous materials to exist in and around the Project area (see Appendix G for a full description of surveys and methodology).

a. Hazardous Materials. An Environmental Data Resources, Inc. (EDR) records search was prepared in support of the Hazardous Materials Technical Memorandum (2017) for the Project and surrounding area. The EDR search was conducted for the Project area and included data for sites surrounding the property. Federal, state, and county lists were reviewed as part of the research effort in order to identify sites that generate, store, treat, or dispose of hazardous materials or sites for which a release or incident has occurred. In addition, the hazardous materials technical analysis included review of historic records, aerial photographs, and topographic maps. Known or suspected environmental conditions associated with the property include the following:

Current and historical agricultural use of the Project area and adjacent properties – Based on review of the historical topographic maps and aerial photographs, the Project area and adjacent properties have historically been used for agricultural purposes. Therefore, the potential exists for shallow soils in the vicinity of the Project area and water in the on-site canals (Blakeley Canal and South Fork Canal) to have been impacted with pesticides.

The presence of on-site oil wells – A review of the Division of Oil, Gas and Geothermal Resources (DOGGR) website indicates six oil wells are located in the Project area. The oil wells include plugged, abandoned, and idle wells. In the past, diesel fuel was often used as a lubricant during drilling of oil wells. The drilling of oil wells in the Project area may have included the placement of an oil well sump adjacent to the well, resulting in the presence of crude oil or drilling fluids in soils in the vicinity of the oil wells. Therefore, there is the potential that hydrocarbon-impacted soil is present in the vicinity of the oil wells.

Potential crude oil spills in the Project area – Three orphan sites that were unable to be mapped (based on the information provided in the EDR report) may be located on the Project site. All three of the orphan sites involved spills of crude oil that are likely associated with oil wells or other oil production facilities. There are numerous oil wells on the subject property and in the area surrounding the Project area.

The listing of Westlake Farms in the landfill database – Westlake Farms is located inside the northwestern border of the Project and is listed in the landfill database. No other pertinent information regarding the landfill listing was provided in the EDR report. According to an article published by the Los Angeles Times (2016), the Sanitation Districts of Los Angeles County (LACSD) owns and operates a composting facility

on the Westlake Farms site. The reported composting facility operations include the mixing of biosolids with wood chips and other green waste to turn the sludge into fertilizer that meets USEPA safety standards. On March 23, 2017, Ann T. Heil, Section Head of the Sanitation Districts of Los Angeles County, indicated that the Los Angeles County Sanitation District purchased approximately 14,000 acres of land from Westlake Farms Inc. through a series of agreements executed between 2000 and 2006. Approximately 12,000 acres of the land are leased back to Westlake Farms for farming operations, and LACSD operates its composting facility on the remaining 2,000 acres. As indicated in **Figure 3.9-1**, the 12,000 acres of farming land is located adjacent to the Project area.

The release of diesel fuel and contaminated soil cleanup associated with Quinn Engine Systems identified at 23311A and 23395 Newton Avenue, Stratford, California – According to the EDR report, both of these addresses are located on the northwestern portion of the Project. Because a site reconnaissance was not conducted as part of the Hazardous Materials Technical Memorandum, it is unknown if these addresses are actually located in the Project area or an adjacent property. According to the EDR report, in May 2003, a spill of 1,500 to 1,600 gallons of diesel fuel occurred at the Quinn Engine Systems site when a valve on a generator was opened by mistake and diesel fuel spilled from the storage tank. The report stated that the valve was fixed, surface fuel was cleaned up, and soil was excavated. Additionally, the EDR report indicates that in 2003, 372.2 tons of "contaminated soil from site cleanup" were removed from the Quinn Engine Systems site and disposed at a landfill. An additional listing indicates 22 tons of "contaminated soil from site cleanup" were removed from the Quinn Engine Systems site. The Quinn Engine Systems site is not presently active. The exact location of the release/cleanup area is unknown based on the documents reviewed as part of the Hazardous Materials Technical Memorandum. Further research of local regulatory oversight agency records could help to determine the location of the release and determine if confirmation sampling was conducted following removal and cleanup of the diesel-impacted soil.

The presence of fuel dispensers and fuel storage tanks on the northwestern portion of the Project– According to Google Earth aerial imagery reviewed as part of the Hazardous Materials Technical Memorandum, there are fuel dispensers on the northwestern portion of the Project area. It is unclear if there are underground storage tanks associated with the fuel dispensers or if the fuel storage tanks that service the dispensers are above-ground. Information relating to the fuel dispensing system was not provided in the EDR report. Further research of local regulatory oversight agency records could help to determine the extent of impact the fuel dispensing system may have on the Project area.

The presence of Westlake Farms Airport and other Westlake Farms structures on the northwestern portion of the Project. Based on review of the historical topographic maps and aerial photographs, Westlake Farms and the associated buildings have been present in the northwestern portion of the Project area since at least 1954, and a landing strip at the farm property has been present since at least 1963. Based on the hazardous materials use and storage identified for Westlake Farms, there is the potential that shallow soils in the vicinity of the private Westlake Farms Airport and other Westlake Farms structures on the northwestern portion of the Project area have been impacted with undocumented releases. Further research of local regulatory oversight agency records could help to determine the extent of impacts the Westlake Farms Airport and other Westlake Farms structures may have in the Project area.

Figure 3.9-1: Map of Area Leased to Westlake Farms from Los Angeles County Sanitation District for Farming Operations

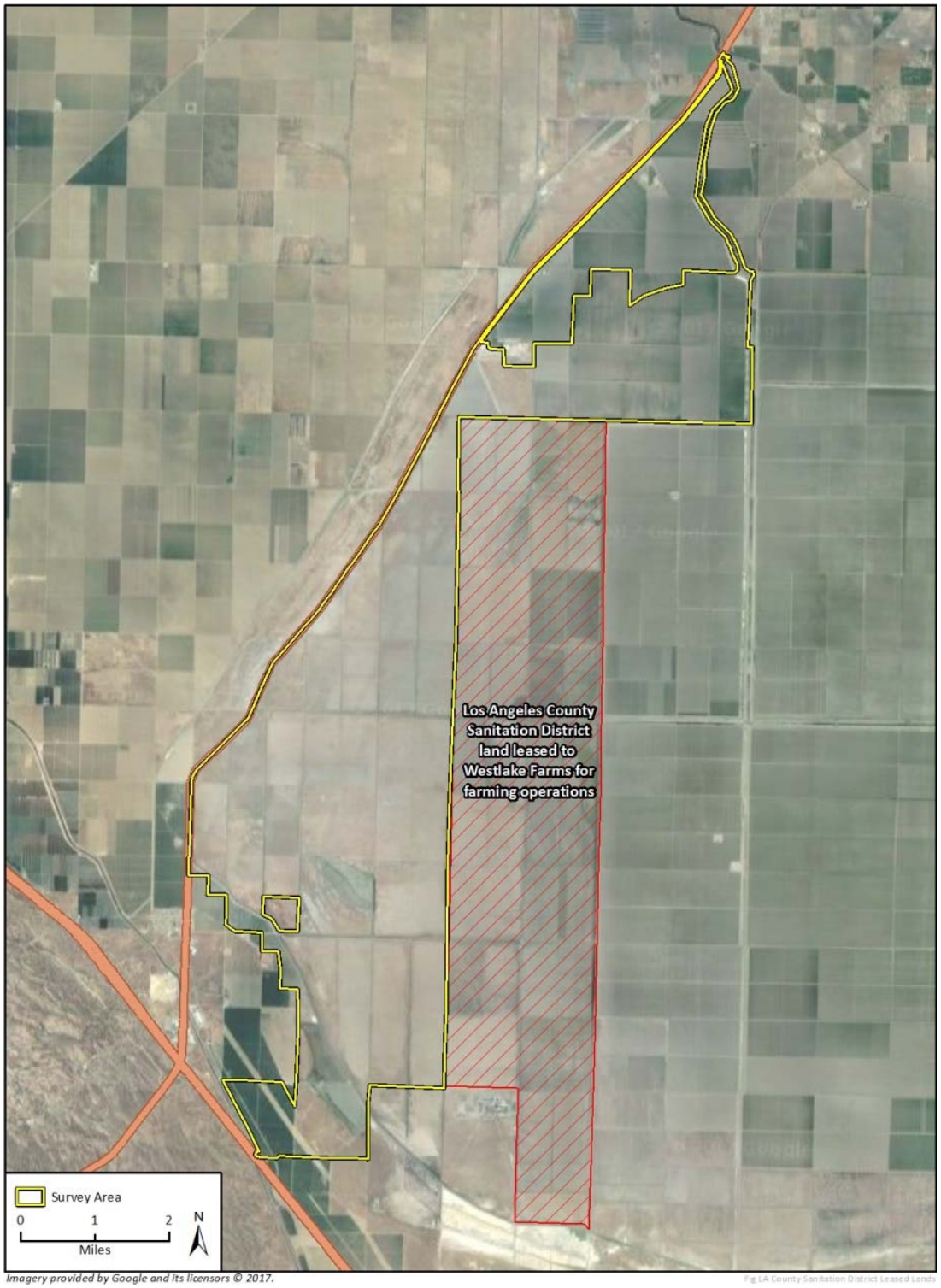
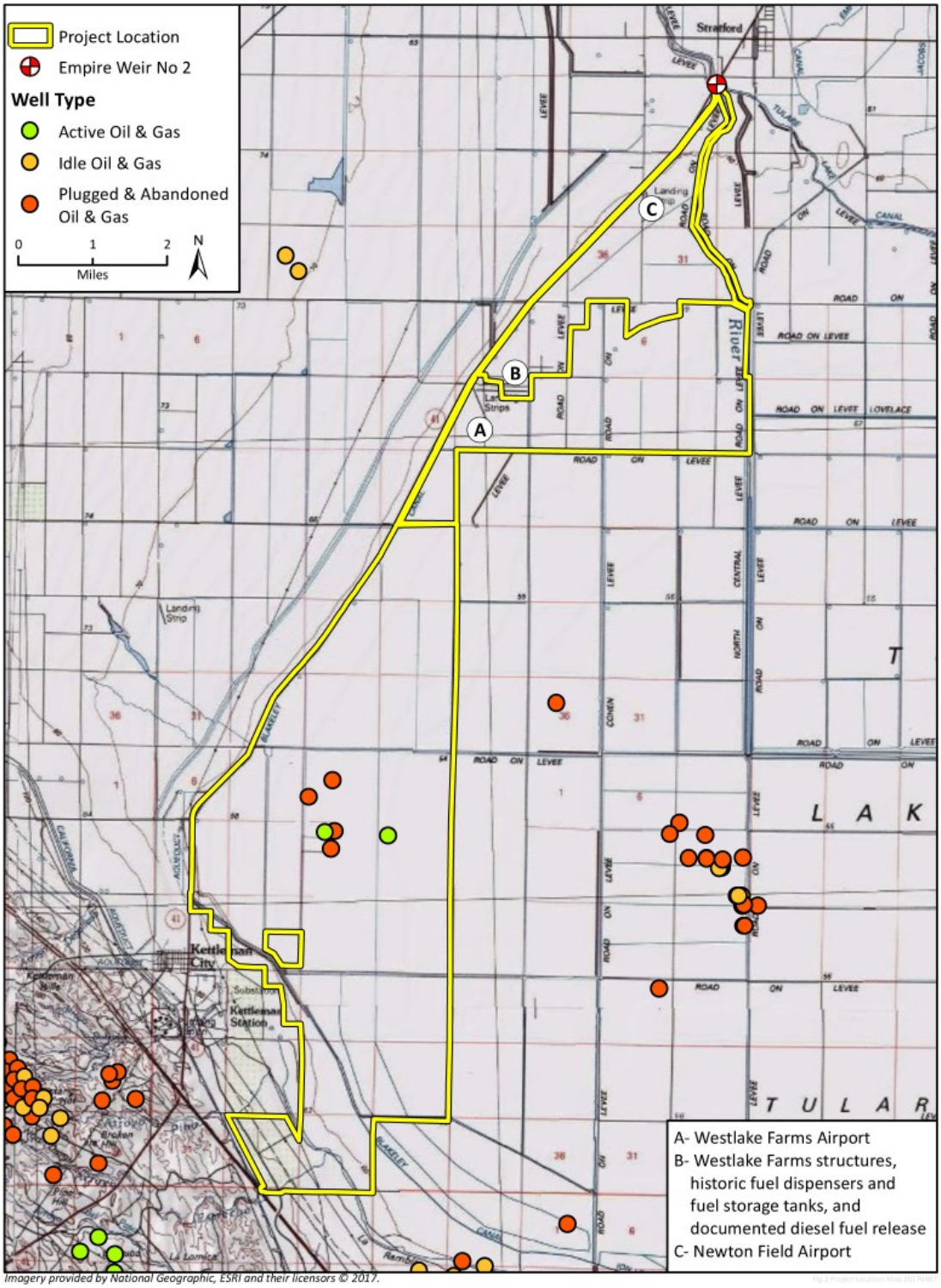


Figure 3.9-2 Site Map



b. Wildland Fire Hazards. Wildland fires have the potential to cause significant loss of life and property, and can result in adverse impacts to the natural environment, such as increased erosion and temporary loss of habitat. The Project is located in a Local Responsibility Area, as designated by the California Department of Forestry and Fire Protection (Kings County, 2007). According to the Kings County General Plan (2010), the Project is primarily located in an area of little wildfire potential with small areas throughout the Project of moderate to high wildfire potential.

c. Airports. According to the Kings County General Plan (2010), the primary hazard to the general public is the possibility of being injured on the ground during an aircraft accident. Only one airport in Kings County is identified for public use, the Hanford Municipal Airport, located approximately 14 miles northeast of the Project. The Project is not located inside the safety zone of the Hanford Municipal Airport. Westlake Farms Airport is located on the northern corridor of the Project and Newton Field Airport is located to the east of the northern corridor. Both the Westlake Farms Airport and the Newton Field Airport are private airports. According to the Kings County General Plan, use of private aircraft in Kings County is mostly related to agriculture, either for crop dusting or private transportation over long distances. Neither the Westlake Farms Airport nor the Newton Field Airport is addressed in the Kings County General Plan.

3.9.2 Regulatory Framework

Hazardous materials and waste can result in public health hazards and environmental contamination if released to soil, groundwater, or air. Hazardous materials, as defined in California Health and Safety Code Section 25501(o), are materials that, because of their "quantity, concentration, or physical or chemical characteristics, pose a significant present or potential hazard to human health and safety or to the environment if released to the workplace or environment." Hazardous materials have been and are commonly used in commercial, agricultural, and industrial applications, as well as to a limited extent in residential areas.

A waste is any material that is relinquished, recycled, or inherently waste-like. California Code of Regulations (CCR) Title 22 Section 66261.1, *et seq.* contains regulations for the classification of hazardous wastes. Article 3 criteria classify waste as hazardous if it is toxic (causes human health effects), ignitable (has the ability to burn), corrosive (causes severe burn or damage to materials), or reactive (causes explosions or generates toxic gases). Article 4 also lists specific hazardous wastes, while Article 5 identifies specific waste categories, including hazardous wastes, extremely hazardous wastes, and special wastes. If improperly handled and released to soil, groundwater, or air (in the form of vapors, fumes, or dust), hazardous materials and wastes can result in public health hazards and environmental contamination.

Federal Policies and Regulations

Federal Risk Management Program

Section 112(r) of the 1990 Federal Clean Air Act amendments requires the USEPA to publish regulations and guidance for chemical accident prevention at facilities that use certain hazardous substances. These regulations and guidance are contained in the Risk Management Plan (RMP) rule. The RMP rule requires facilities that use extremely hazardous substances to develop an RMP. These plans must be revised and resubmitted to the USEPA every five years. The information required from facilities under an RMP helps local fire, police, and emergency response personnel prepare for and respond to chemical emergencies.

Comprehensive Environmental Response, Compensation, and Liability Act

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), also referred to as the Superfund law, regulates the potential for liability relating to the cleanup of hazardous substances, provides for defense against liability, identifies contaminated sites, and defines hazardous substances,

petroleum products, and petroleum exclusions. The Superfund Amendments and Reauthorization Act (SARA), includes emergency planning and community right-to-know. Under CERCLA, facilities must report where toxic chemicals are transferred, chemical-specific information, and supplemental information, along with identification information for their facility to the USEPA. Hazardous substances must be reported and releases to the environment accounted for.

Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA) regulates potential health and environmental problems associated with solid-waste hazards and nonhazardous waste. RCRA defines solid waste as garbage or refuse; sludge from wastewater treatment plants, water supply treatment plants, or air pollution control facilities; and other discarded materials. Solid waste can be either hazardous or non-hazardous. Hazardous waste is waste that burns readily, is corrosive or reactive, contains certain amounts of toxic chemicals, or has been included on the USEPA's list of hazardous wastes. RCRA regulates the disposal of waste and aims to reduce waste generation. It restricts which facilities can receive hazardous wastes and regulates facilities to ensure proper handling of materials.

Preliminary Remediation Goals

The USEPA has published screening levels, referred to as Preliminary Remediation Goals, for the evaluation of chemicals commonly found in soil or groundwater where a release of hazardous materials has occurred (USEPA, 2008a). For an industrial worker, these screening levels are conservative estimates of safe levels of a chemical that a worker could be exposed to in soil and groundwater. If the concentration of a chemical in the soil or groundwater is below the Preliminary Remediation Goal, then it can be assumed that the chemical would not pose a health risk to the worker.

Hazardous Materials Worker Safety Requirements

The Occupational Safety and Health Administration (OSHA) is the federal agency responsible for ensuring worker safety. The federal regulations for worker safety are contained in the CFR Title 29, as authorized in the Occupational Safety and Health Act of 1970. These regulations provide standards for safe workplaces and work practices, including those relating to hazardous materials handling.

State Policies and Regulations

Process Safety Management

Facilities that handle more than 10,000 pounds of a flammable liquid, or specific chemicals above threshold quantities, are subject to the Process Safety Management regulations specified in CCR Title 8 Subchapter 7 and CFR Title 29 Section 1910.119. In accordance with these regulations, the facility operator must conduct a hazard analysis for each process, develop written operating procedures, provide employee training, establish and implement an emergency action plan, and conduct periodic audits of the process. Prior to starting up a new process or after a major modification to an existing process, the operator must perform a pre-startup review to ensure that the construction and installed equipment are in accordance with design specifications; safety, operating, maintenance, and emergency procedures are in place and are adequate; and employees are appropriately trained. For maintenance, the operator must also provide written procedures to maintain the ongoing integrity of equipment required for the regulated process.

California Fire Code

The California Fire Code, Article 80, includes specific requirements for the safe storage and handling of hazardous materials. These requirements reduce the potential for a release of hazardous materials and for the mixing of incompatible chemicals, and specify design features to reduce the potential for a release of hazardous materials that could affect public health or the environment, including:

- Separation of incompatible materials with a noncombustible partition
- Spill control in all storage, handling, and dispensing areas
- Separate secondary containment for each chemical storage system

The California Fire Code, Article 79, includes specific requirements for the safe storage and handling of flammable and combustible liquids. Specific requirements address:

- Fire protection
- Prevention and assessment of unauthorized discharges
- Labeling and signage
- Protection from sources of ignition
- Specifications for piping, valving, and fittings
- Maintenance of above-ground tanks
- Requirements for storage vessels, vaults, and overfill protection
- Requirements for dispensing, using, mixing, and handling of flammable and combustible liquids

Transportation of Hazardous Wastes

Regulatory requirements for the transport of hazardous wastes in California are specified in CCR Title 22 Division 4.5 Chapters 13 and 29. In accordance with these regulations, all hazardous waste transporters must have identification numbers issued by either the USEPA or the California Department of Toxic Substances Control (DTSC) to identify whether the waste is classified as hazardous by federal regulations or under California regulations. Hazardous waste transporters must comply with the California Vehicle Code, California Highway Patrol regulations (CCR, Title 13), the California State Fire Marshal regulations (CCR Title, 19), U.S. Department of Transportation regulations (CFR, Title 49), and USEPA regulations (CFR, Title 40). California regulations specify specific cleanup actions that must be taken by a hazardous waste transporter in the event of a discharge or spill, and for the safe packaging and transport of hazardous wastes.

Waste Classification Criteria

In accordance with CCR Title 22 Section 66261.20, *et seq.,* excavated soil would be classified as a hazardous waste if it exhibits the characteristics of ignitability, corrosivity, reactivity, or toxicity.

A waste is considered hazardous by state and federal regulations if the soluble concentration exceeds the federal regulatory level as determined by the toxicity characteristic leaching procedure (TCLP). A waste is considered hazardous under state regulations if the soluble contaminant concentration exceeds the soluble threshold limit concentration (STLC). A waste may also be classified as toxic if testing indicates toxicity greater than the specified criteria.

Lead in Construction Standard

The California Occupational Safety and Health Administration (Cal/OSHA) Lead in Construction Standard (CCR, Title 8 Section 1532.1) requires project proponents to develop and implement a lead compliance plan when lead-based paint would be disturbed during construction. The plan must describe activities that could emit lead, methods for complying with the standard, safe work practices, and a plan to protect workers from exposure to lead during construction activities. Cal/OSHA requires 24-hour notification if more than 100 square feet of lead-based paint would be disturbed.

Hazardous Materials Worker Safety Requirements

The state regulations concerning the use of hazardous materials in the workplace are included in CCR Title 8, and include requirements for safety training, availability of safety equipment, accident and illness prevention programs, hazardous substance exposure warnings, and emergency action and fire prevention plan preparation. Cal/OSHA also enforces hazard communication program regulations, which contain worker safety training and hazard information requirements, such as procedures for identifying and labeling hazardous substances, communicating hazard information relating to hazardous substances and their handling, and preparation of health and safety plans to protect workers. Cal/OSHA standards are generally more stringent than federal OSHA regulations.

California Accidental Release Program

California Health and Safety Code (CHSC) Section 25531 and the California Accidental Release Program (CalARP) regulate the registration and handling of regulated substances. CalARP incorporates the requirements of the federal RMP rule, but is more stringent with respect to the threshold quantities of chemicals requiring RMPs, and includes more chemicals than the federal program. Regulated substances are any chemicals designated as an extremely hazardous substance by the USEPA as part of its implementation of SARA Title III or by the State of California pursuant to CHSC Section 25532. The requirements of CHSC Section 25531 overlap or duplicate some of the requirements of SARA and the Federal Clean Air Act. Facilities handling or storing regulated substances at or above Threshold Planning Quantities must register with their local Certified Unified Program Agency (CUPA), which is the King's County Environmental Health Services Department (EHS), and prepare a RMP. CalARP is found in CCR Title 19 Chapter 4.5. The RMP is implemented by the business to prevent or mitigate releases of regulated substances that could have off-site consequences through hazard identification, planning, source reduction, maintenance, training, and engineering controls.

Division of Oil, Gas, and Geothermal Resources

The California Department of Conservation, Division of Oil, Gas, & Geothermal Resources (DOGGR) oversees the drilling, operation, maintenance, and plugging and abandonment of oil, natural gas, and geothermal wells. DOGGR also oversees enhanced recovery projects that try to maximize production from the state's oil reservoirs. The regulatory program implemented by DOGGR includes acting as a clearinghouse for information about the state's oil, natural gas and geothermal industries, monitoring the proper installation and maintenance of blowout prevention equipment, regulating well design, ensures that idle and orphan wells are properly plugged and abandoned, regulating geothermal wells and offshore drilling, and ordering the re-abandonment of any well that is considered hazardous or poses a danger to health, the environment or natural resources.

Regional and Local Policies and Regulations

The SWRCB, through its regional boards, regulates the discharge of potentially hazardous materials to waterways and aquifers and administers basin plans for groundwater resources in various regions of the state. The SWRCB provides oversight for sites at which the quality of groundwater or surface waters is threatened, and has the authority to require investigations and remedial actions. The CVRWQCB is the regional board that has jurisdiction over the Project area.

The SJVAPCD may impose specific requirements to protect ambient air quality from dust or other airborne contaminants.

California State Senate Bill 1082 was passed in 1993 and created the Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program). The Unified Program consolidates, coordinates, and makes consistent the administrative requirements, permits, inspections, and enforcement activities of six environmental and emergency response programs. The California Environmental Protection Agency and other state agencies set the standards for their programs while local governments implement the standards through CUPA. These local implementing agencies, or CUPA, include the Kings County Environmental Health Department. Site inspections for hazardous materials programs (aboveground storage tanks (ASTs), underground storage tanks (USTs), hazardous waste treatment, hazardous waste generators, hazardous materials management and response plans, and the Uniform Fire Code) are consolidated and accomplished during a single inspection.

Kings County Mosquito Abatement District

The Kings County Mosquito Abatement District (District) was established to control the populations of mosquitos and minimize the spread of disease. Kings County Mosquito Abatement District was consolidated with Hanford and Corcoran Mosquito Abatement Districts in 1947 to encompass a total area of 580 square miles; 546 square miles in Kings County and 34 square miles in Tulare County. The District takes an aggressive and proactive approach to control the populations of mosquitoes within the counties by utilizing an integrated program based on surveillance, control, and source reduction. The integrated mosquito management program established by the District relies on a surveillance program, use of mosquito control products (including mosquito traps and biological and chemical controls), and cooperation with local agencies.

3.9.3 Impact Analysis

Methodology for Analysis

This analysis focuses on the effects of the use of hazardous materials, the potential to encounter and/or mobilize existing hazardous substances in soil and groundwater, the potential to interfere with an established emergency response or evacuation plan, and the risk of hazards associated with private airstrips and wildfires. Each potential impact is assessed in terms of the applicable regulatory requirements. Mitigation measures are identified for significant impacts.

Thresholds of Significance

For the purposes of this analysis, an impact to public health or the environment would be significant if the proposed Project would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.
- 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.

- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school.
- Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment.
- For a Project located inside 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, the Project would result in a safety hazard for people residing or working in the project area.
- For a project in the vicinity of a private airstrip, the Project would result in a safety hazard for people residing or working in the project area.
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.
- Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.
- Create a public health hazard from new or increased exposure to vector-borne diseases by providing substantial new habitat for mosquitoes or other vectors.

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to actions associated with the proposed Project are identified below along with a supporting rationale as to why further consideration is unnecessary and a no impact determination is appropriate.

For a Project located inside 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, the Project would result in a safety hazard for people residing or working in the project area: The proposed Project is not located within two miles of a public airport. Therefore, there would be no impact related to a safety for people residing or working in the project area as a result of a public airport.

Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school: The Project is not located within 0.25 mile of an existing or proposed school. Therefore, there would be no impact related to emissions or use of hazardous materials within 0.25 mile of a school.

Impacts and Mitigation Measures

Impact HAZ-1 Create a Hazard through the Transport, Use, or Disposal of Hazardous Materials

Construction

All Facilities

Construction of the proposed project would temporarily increase the routine transport and use of hazardous materials used in construction activities. Limited quantities of miscellaneous hazardous substances, such as diesel fuel, oil, solvents, and other similar materials, would be brought onto the construction site, used, and stored during the construction period. These materials would be disposed of in accordance with all applicable laws pertaining to the handling and disposal of hazardous waste. The use, handling, storage, and disposal of the hazardous materials would be regulated by local, state, and federal regulations. Construction of the Project would temporarily increase the routine transport and use of hazardous materials used in construction activities.

Operations & Maintenance

All Facilities

Operation of the proposed Project does not generally involve the storage or transport of hazardous materials. However, the use of pumping plants onsite may involve limited quantities of diesel fuel and hydraulic fluids for lubrication of pumps, motors, and control valves with petroleum products. Use of petroleum products creates a risk for spills and a possible need for disposal of petroleum containers. Additionally, onsite maintenance may include the limited use of herbicides and/or pesticides. However, these materials would be applied per manufacturer's instruction and may result in a possible need for disposal of used containers.

Additionally, as discussed in *Chapter 3.13 Oil, Gas and Mineral Resources*, there 15 plugged and abandoned oil wells and two active oil wells mapped in the Project area by DOGGR. Plugged and abandoned wells mapped in the Project area meet requirements and procedures administered by DOGGR, and are not considered active threats of hazardous materials as they have been properly decommissioned under supervision of DOGGR. The two active oil wells onsite would continue to managed by their owners under oversight by DOGGR, and would be protected from the reservoir's storage cells by perimeter levees (that would also serve as access roads to the facilities). Impacts from potential oil spills from the active wells are addressed in *Chapter 3.10 Hydrology and Water Quality.*

Although construction and operation of the Project would comply with all relevant regulations, including the enforcement of hazardous materials transportation regulations and the County's General Plan Safety Element regarding hazardous materials, to ensure an additional level of safety and reduce any remaining potentially significant impact, mitigation measures HAZ-1, HAZ-2, HYD-1, and OIL-1 would also be implemented.

Significance Determination before Mitigation

Potentially significant.

Mitigation Measures

Mitigation measures HAZ-1 and HAZ-2 shall be implemented to mitigate the potential impacts to the public or environment from the routine transport, use, or disposal of hazardous materials associated with construction and operation of the Project.

Mitigation Measure HAZ-1: Hazardous Materials Management and Spill Control Plan

Before construction begins, all construction contractors shall be required to develop and implement a Hazardous Materials Management and Spill Control Plan (HMMSCP) that includes project-specific contingency plan for hazardous materials and waste operations. The HMMSCP shall establish policies and procedures consistent with applicable codes and regulations, including but not limited to the California Building and Fire Codes, as well federal OSHA and Cal/OSHA regulations. The HMMSCP shall articulate hazardous materials handling practices to prevent their release into the San Joaquin Valley groundwater basin during construction and operation of the Project.

Mitigation Measure HAZ-2: Preparation of Hazardous Materials Business Plan

Prior to operation of the new facilities and, as appropriate, a Hazardous Materials Business Plan (HMBP) shall be prepared and implemented for the proposed Project. The HMBP shall include a hazardous materials inventory, site plan, an emergency response plan, and requirements for employee training. An existing HMBP can be updated and resubmitted for the expanded facilities.

Also, see **Mitigation Measure HYD-1: Storm Water Pollution Prevention Plan** and **Mitigation Measure OIL-1: Use Proper Well Remedial Steps for Unknown Wells in Project Area**.

Significance Determination after Mitigation

With implementation of the above measures and Mitigation Measure HYD-1 and Mitigation Measure OIL-1, impacts related to transport, use or disposal of hazardous materials during construction and operation of the Project would be reduced to less than significant.

Impact HAZ-2 Create a Hazard through the Disturbance of Onsite Hazardous Materials that could Potentially Create a Safety Hazard to the Public or Environment

Construction

All Facilities

Based on the results of the EDR Report and review of historical documents, the following hazardous materials are located or are potentially located on-site:

- Pesticide-impacted soil as a result of the historical agricultural use in the Project area.
- Hydrocarbon-impacted soil as a result of onsite oil wells, onsite fuel dispensers and fuel storage tanks, and reported releases onsite. Trenching and other ground-disturbing activities during Project construction could disturb soil or groundwater contamination.
- Ground-disturbing activities during construction, including grading activities, could result in a potential safety hazard through the spread of materials via dust particulates. Improper handling and disposal of contaminated soils could result in a health risk to people.

As described under Impact HAZ-1, the proposed Project would involve the routine transport, storage, use, and disposal of hazardous materials. The proposed Project therefore has potential to create a hazard through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. Construction of the Project would comply with all relevant regulations, and implementation of **Mitigation Measure HAZ-1**, as well as **Mitigation Measures HAZ-3 through HAZ-5,** would reduce these potential impacts to less than significant.

Operations & Maintenance

All Facilities

Operation and maintenance of the Project does not involve ground disturbance; therefore, a safety hazard is not anticipated as a result of disturbance or mobilization of on-site hazardous materials would not occur.

Significance Determination before Mitigation

Potentially significant.

Mitigation Measures

The following mitigation measures would reduce impacts related to reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment during Project construction:

Mitigation Measure HAZ-3: Soil Sampling and Disposal

Prior to construction, a soil assessment shall be completed under the supervision of a professional geologist or professional engineer. If soil sampling indicates the presence of any contaminant in quantities not in compliance with applicable laws, the RWQCB or DTSC shall be contacted to

determine proper disposal. Prior to the commencement of site construction, the following shall be performed: an assessment of air resource impacts and health impacts associated with excavation activities, transportation impacts from the removal activities, and risk of upset management practices shall be employed if an accident occurs on or off the site.

Mitigation Measure HAZ-4: Contaminated Soil Contingency Plan

Construction contractors shall develop and implement a Contaminated Soil Contingency Plan to handle treatment and/or disposal of contaminated soils. If contaminated soil is encountered during project construction, work shall halt and an assessment made to determine the extent of contamination. Treatment and/or disposal of contaminated soils shall be conducted in accordance with the Contingency Plan.

Mitigation Measure HAZ-5: Onsite Monitoring

During construction activities in the areas of suspect contamination, monitoring of dust and air quality shall be completed. Fugitive vapor emissions shall be monitored with the use of a PID or equivalent. If necessary, dust would be controlled by periodically spraying the work areas with water or other approved dust-control materials. If required by the Authority to Construct/Permit to Operate permit by the San Joaquin Valley Air Pollution Control District, a particulate air monitor would be utilized to monitor dust. The meters shall be calibrated in accordance with their respective manufacturer specifications. During the soil excavation and loading activities, fugitive airborne emissions shall be monitored along the property boundary and at the interpreted down-wind perimeter of the site. If fugitive airborne emissions are measured at levels exceeding permit conditions, operations would cease until the dust the emissions reach an acceptable level.

Significance Determination after Mitigation

With implementation of the above measures, impacts related to release of hazardous materials during construction would be reduced to less than significant.

Impact HAZ-3 Be Located on a Site that is Included on a List of Hazardous Materials Sites Compiled Pursuant to Government Code Section 65962.5

All Facilities

Per the EDR Report, Westlake Farms, located at 23311 Newton Avenue, Stratford, California, is on and adjacent to the northwestern portion of the Project area. Mile Marker 3.2 State Highway 41 is located south of Newton Road, near 23rd Avenue, which appears to be the location of Westlake Farms. The Westlake Farms site is listed on the Recovered Government Archive Landfill (RGA LF), which is part of Government Code Section 65962.5. The EDR RGA LF database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. According to the EDR report, the property is listed as a landfill from 2000 to 2004.

According to an article published by the Los Angeles Times (2016), Los Angeles County Sanitation District owns and operates a composting facility on the Westlake Farms site. The reported composting facility operations include the mixing of biosolids with wood chips and other green waste to turn the sludge into fertilizer that meets USEPA safety standards. On March 23, 2017, Ann T. Heil, Section Head of the Sanitation Districts of Los Angeles County, indicated that the Los Angeles County Sanitation District purchased approximately 14,000 acres of land from Westlake Farms Inc. through a series agreements executed between 2000 and 2006. Approximately 12,000 acres of the land are leased back to Westlake Farms for farming operations, and Los Angeles Sanitation District operates a composting facility on the remaining 2,000 acres. Since the reported facility does not handle or generate hazardous materials, the

reported Westlake Farms landfill would have a less than significant impact during construction and operation of the Project.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact HAZ-4 Result in a Safety Hazard for People Residing or Working in the Project Area in the Vicinity of a Private Airstrip

Construction

All Facilities

Westlake Farms Airport and Newton Field Airport are private airfields located on the northern portion of the Project area. These airports provide private aviation services to the area. According to the Kings County General Plan (2010), much of the use of private aircraft in Kings County is related to agriculture, either for crop dusting or private transportation over long distances. Safety standards related to height limitations for private airfields in Kings County are not discussed in the General Plan; however, safety hazards associated with airports are generally related to construction of tall structures that could interfere with airplane flight paths, or with increasing the number of people working or residing in areas subject to crash hazards. Due to the fact that both the Westlake Farms Airport and the Newton Field Airport are not public facilities and aircraft operations are limited, a safety hazard for workers during construction of the Project as a result of these airports would not occur. Therefore, impacts related to the presence of the Westlake Farms Airport and the Newton Field Airport at the Project would be less than significant.

Operations & Maintenance

All Facilities

The proposed Project does not include residential development that would increase the number of people residing in proximity to private airports. Operation and maintenance of the Project would also involve limited activity by onsite personnel during maintenance activities. Therefore, impacts related to the onsite and nearby airports would be less than significant during operation of the Project.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact HAZ-5 Impair or Physically Interfere with an Adopted Emergency Evacuation and Response Plan

Construction

All Facilities

The proposed Project would consist of water storage through the construction of a leveed impoundment. Associated pumping plants would also be installed on applicable pipelines and canal segments, in addition to the construction and operation of ancillary facilities such as an electrical substation and maintenance yard. Access for these facilities would be available from existing access roads on-site. Road closures during construction activities are not anticipated. Although no construction would occur on the roadways around the Project area, there is potential for traffic to be impacted during transport of equipment and construction

materials or removal of onsite soil. Therefore, construction of the proposed Project could interfere with emergency response or evacuation plans. Additionally, workers traveling to and from the site have the potential to increase traffic in the vicinity of the Project. As such, impacts associated with increased traffic resulting from Project construction could be potentially significant.

Operations & Maintenance

All Facilities

Project operations and maintenance would involve limited transport activity by onsite personnel and little to no interference with traffic and, therefore, represents a less than significant impact.

Significance Determination before Mitigation

Potentially significant.

Mitigation Measures

Implementation of **Mitigation Measure TRA-1, Implement a Construction Management Plan to Minimize Interference with Traffic and Emergency Response Hazards,** would address the potentially significant impact associated with the Project's potential to interfere with an adopted emergency response or evacuation plan during construction. See *Section 3.17 Transportation* for a description of this mitigation measure.

Significance Determination after Mitigation

With implementation of the above measure, impacts related to interference with an adopted emergency and response plan would be reduced to less than significant.

Impact HAZ-6 Exposure of People or Structures to Wildfire Risks.

Construction

All Facilities

According to the Kings County General Plan (2010), the Project is located in areas of little (on the northern portion of the Project area) and moderate to high (on the southern portions of the Project) wildfire potential. Since this part of the county is isolated and contains no urban settlements, hazards to life and property are considered minimal.

During construction activities, the use of spark-producing construction machinery in or adjacent to areas of moderate fire hazard could potentially create hazardous fire conditions and expose workers and others to wildfire risks. Impacts are thus considered to be potentially significant.

Operations & Maintenance

All Facilities

The Project would not increase the exposure of people or structures to wildfire risks due to population growth. Therefore, it represents a less than significant impact during operation and maintenance of the Project. In addition, the proposed Project would not increase the exposure of people or structures to wildfire risks because it would not induce population growth in or movement to areas of increased wildfire hazard zones.

Significance Determination before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure HAZ-6 shall be implemented to mitigate the potential to risk of loss, injury, or death involving wildland fires due to the Project.

Mitigation Measure HAZ-6: Prevention of Fire Hazards

During construction of the Project, staging areas, welding areas, or areas slated for construction shall be cleared of dried vegetation or other material that could ignite. Construction equipment that includes a spark arrestor shall be equipped in good working order. In addition, construction crews shall have a spotter during welding activities to look out for potentially dangerous situations, such as accidental sparks. Other construction equipment, including those with hot vehicle catalytic converters, shall be kept in good working order and used only inside cleared construction zones. The creation and maintenance of approved fire access to work areas shall be required in accordance with local fire regulations. During construction of the Project, contractors shall require vehicles and crews working in the Project area to have access to functional fire extinguishers.

Significance Determination after Mitigation

With implementation of the above measure, impacts related to wildland fire would be reduced to less than significant.

Impact HAZ-7 Create a New or Increased Human Health Hazards Associated with Vector-Borne Diseases.

Construction

All Facilities

Construction sites are generally flat and have the potential to create ponding areas after a rainstorm. Large ponding areas that do not completely dry after three to five days are conducive to mosquito breeding and can contribute to mosquito population growth. In addition, to satisfy stormwater permit requirements, some construction contractors create drainage ditches and subsequent retention ponds at Project construction sites to prevent stormwater runoff from entering nearby waterbodies. Increased surface water area would create habitat suitable for mosquito egg deposition. These ponds also have the potential for becoming mosquito breeding grounds, resulting in a potentially significant impact at all Project facility construction sites.

Operations & Maintenance

All Facilities

The Kettleman Reservoir and conveyance canals, when in operation, would increase water surface area potentially contributing to a favorable habitat for mosquitoes and several vectors. Fluctuations in surface water levels in the Kettleman Reservoir due to as-needed diversions would create favorable conditions for mosquito egg deposition and mosquito habitat every three out of ten years when the Project is anticipated to be in operation. The standing water in the Reservoir would support mosquito or vector populations during this period, but would also attract mosquito predators in the wetland elements of the reservoir, such as frogs and birds. These waterfowl and other wetland species are a key to the recreational element of the Kettleman Reservoir. Recreational use would be facilitated by the establishment of wildlife viewing areas along the reservoir for visitors to observe waterfowl and other wetland species.

However, because these recreation areas would be open to the public, mosquito abatement is a priority to decrease the risk of spreading disease. Although existing mosquito abatement controls are in use in Kings County, the maintenance and operational activities due to the establishment of the Kettleman Reservoir

may result in increased impacts to/from mosquito or vector populations, habitat, controls, or the spread of mosquito- or vector-borne illnesses. This would result in a potentially significant impact

Significance Determination before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure HAZ-7 shall be implemented to mitigate the potential increase in exposure to vector-borne diseases (i.e. through mosquitoes) due to Project operations.

Mitigation Measure HAZ-7: Develop and Implement a Mosquito, Vector, and Other Nuisance Problem Control Plan

Semitropic shall prepare and implement a Mosquito, Vector, and Other Nuisance Problems Control Plan for the Project in consultation with the Kings County Mosquito Abatement District. This Plan shall include, but not limited to, the following:

- Conduct routine inspection and virus surveillance activities within the Kettleman Reservoir and conveyance pipelines.
- Minimize places where mosquitoes, ticks, rodents, or rattlesnakes may inhabit by removing heavy brush, trimming and pruning landscape shrubs, and mowing grass areas regularly.
- Install bird nesting boxes to encourage birds that feed on mosquitoes, midges and other vectors or nuisance species.
- Conduct routine inspections of all pipelines and other water conveyance structures for aboveground leaks that could create standing water. Repair all leaks in a timely manner.
- Conduct routine inspections of property for stinging insect nests and remove them, if necessary, to avoid public health or nuisance issues.
- Promptly remove from property all dead animals or carnage.

Significance Determination after Mitigation

Implementation of **Mitigation Measure HAZ-7,** in combination with County control and public outreach programs, would reduce the level of significance of Project impacts to public health from mosquitoes, other vectors, and nuisance problems to less than significant.

Cumulative Impacts

The geographic scope of potential cumulative impacts related to hazards and hazardous materials encompasses the Project and immediate vicinity. There are six relevant projects within the immediate vicinity of the proposed Project that may contribute to cumulative impacts:

- Quay Valley Community Development - a new 7,175-acre community to be developed in south Kings County.
- Kettleman Hills Facility Expansion - expanding the existing B-18 Landfill and construct a new B-20 Landfill for hazardous waste and designated waste disposal.
- Kettleman City Surface Water Treatment Plant and Commercial Water Storage Tanks (Treatment Plant) – construction of a new surface water treatment plant to treat surface water for potable supply.
- Southwest Groundwater Banking Project – development of a project to divert and store floodwater from the Kings River and local stormwater.

- JID Distributed Recharge Bypass and Lassen Projects – improvement to and construction of recharge facilities to divert and store floodwater from the Kings River.
- Terranova On-Farm Flood Capture and McMullin Recharge Site – improvements to and construction of facilities to divert floodwater from the Kings River for recharge on existing farm lands.

Potential cumulative impacts related to hazards and hazardous materials are generally site-specific and depend on local geologic and soil conditions. Other hazards and hazardous materials-related impacts resulting from construction and/or operation of these related projects are expected to be similar to those anticipated for the proposed Project, and as such, there are no anticipated cumulative impacts associated with the proposed Project and the projects listed above assuming the implementation of construction best management practices at all sites.

3.10 Hydrology and Water Quality

This section presents the physical and regulatory setting for hydrology and water quality conditions at the Project area, and analyzes the impacts of proposed Project on hydrology and water quality in the project vicinity. The impact analysis is supported by the following documents included in appendices of this document:

- Appendix F – Breach Analysis Technical Memorandum
- Appendix H –Water Quality Assessment for the Tulare Lake Storage and Floodwater Protection Project
- Appendix I – South Fork Kings River Hydrology Evaluation Technical Memorandum

3.10.1 Environmental Setting

The proposed Project is located in unincorporated Kings County. The following describes existing hydrologic and hydrogeologic conditions within the project region, including surface water features, groundwater resources, and water quality; and provides a discussion of the environmental regulations associated with surface water, groundwater, and water quality.

Climate

The climate in the Project area is typical of the southern San Joaquin Valley. In general, the Project area experiences a Mediterranean environment with mild winters and dry summers. The average annual temperature is 63.0 degrees Fahrenheit (°F), with a monthly average maximum temperature of 97.2° F in August and a monthly average minimum temperature of 35.9° F in December (Tulare Lake Basin Water Storage District [TLBWSD], 2015). In general, spring is mild with some wind, while summers are hot and dry. The fall months are characterized by warm afternoons and cool evenings, whereas the winter season is typically foggy and rainy, with temperatures seldom dropping below the freezing point (Summers Engineering, Inc., 2012). Most precipitation falls between the months of October and May, with an average annual rainfall around 7.4 inches (Summers Engineering, Inc., 2012). The standard annual average evapotranspiration rate (ETo) for the area is approximately 4.9 inches per year (Hanford, 2010). ETo measures the loss of water to the atmosphere by evaporation from soil and plant surfaces and transpiration from plants.

Regional Topography

The topography of the Project area is generally flat terrain with an average slope of about one-foot per mile from the Project area's northern and western boundaries towards the lowest region in the Tulare Lake bed, at approximately 175 feet above mean sea level (MSL) (TLBWSD, 2015), which is south and east of the Project area. The Tulare Lake bed area is a 'closed' basin with no natural outlet; that is, there was no natural outflow from the historic Tulare Lake. This changed in the late 1870's as a result of upstream diversions on the east side of the San Joaquin Valley from the four major river tributaries to the lake (Kings, Kaweah, Tule and Kern Rivers) and reclamation of land for farming. However, periodic floodwaters occurring in above-normal runoff years can inundate highly productive farmland in the Project area.

Regional Surface Water Hydrology

The Project is located within the Tulare Lake Basin (Basin), historically fed by runoff from the Kings, Kaweah, Tule, and Kern Rivers originating in the southern Sierras east of the Project area (Error! Reference source not found.). The four rivers are currently controlled by dams and reservoirs constructed by the U.S. Army Corps of Engineers (USACE) in the 1950's and 1960's. Under natural conditions, waters from each

river entered various distributary[1] channels once it emerged from the Sierra. Deposition of sediment by these distributaries have built several alluvial fans that compose the soils and aquifers of the east side of the San Joaquin Valley. In recent time, the distributary systems have been supplemented with man-made structures to assist the movement of water across the valley floor, largely for purposes of agricultural supply (*CVRWQCB*, 2012). Smaller uncontrolled streams, including Deer Creek, Poso Creek, and the White River, provide erratic flows during flood periods. Currently, flooding of cropland occurs an average of one in four to five years (TLBWSD, 2015), with residual floodwaters in Tulare Lake bed used to the maximum extent possible for irrigation. Floodwater not used for irrigation is lost primarily to evaporation.

Kings River

The 272-mile Kings River starts high in the western slope of the southern portion of the Sierra Nevada, and flows in a mostly southwesterly direction toward the Tulare Lake bed. Pine Flat Dam, located in the Sierra foothills east of Fresno, was completed in 1954 and is operated for flood control by the USACE. The Kings River Conservation District (KRCD) and the Kings River Water Association (KRWA) coordinate water storage operations of the Pine Flat Reservoir for water supply purposes. A series of weirs, canals, and ditches below Pine Flat Reservoir also control flows and diversions of Kings River water. Murphy Slough, Fresno Slough, and James Bypass provide connections between the North Fork of the Kings River and the San Joaquin River, while the South Fork of the Kings River veers southwards toward Stratford, terminating in the Tulare Lake bed.

The Kings River is the primary source of surface water into the Project area. Kings River water is delivered to the Project area from the northeast through the Lakeland Canal, from the northwest through the South Fork of the Kings River, and through other canals. Kings River flows into the Project Area are primarily regulated by Empire Weir No. 2, which directs flows into the Blakeley Canal, South Fork Canal, and Tulare Lake Canal, as shown in Error! Reference source not found.

Kaweah River

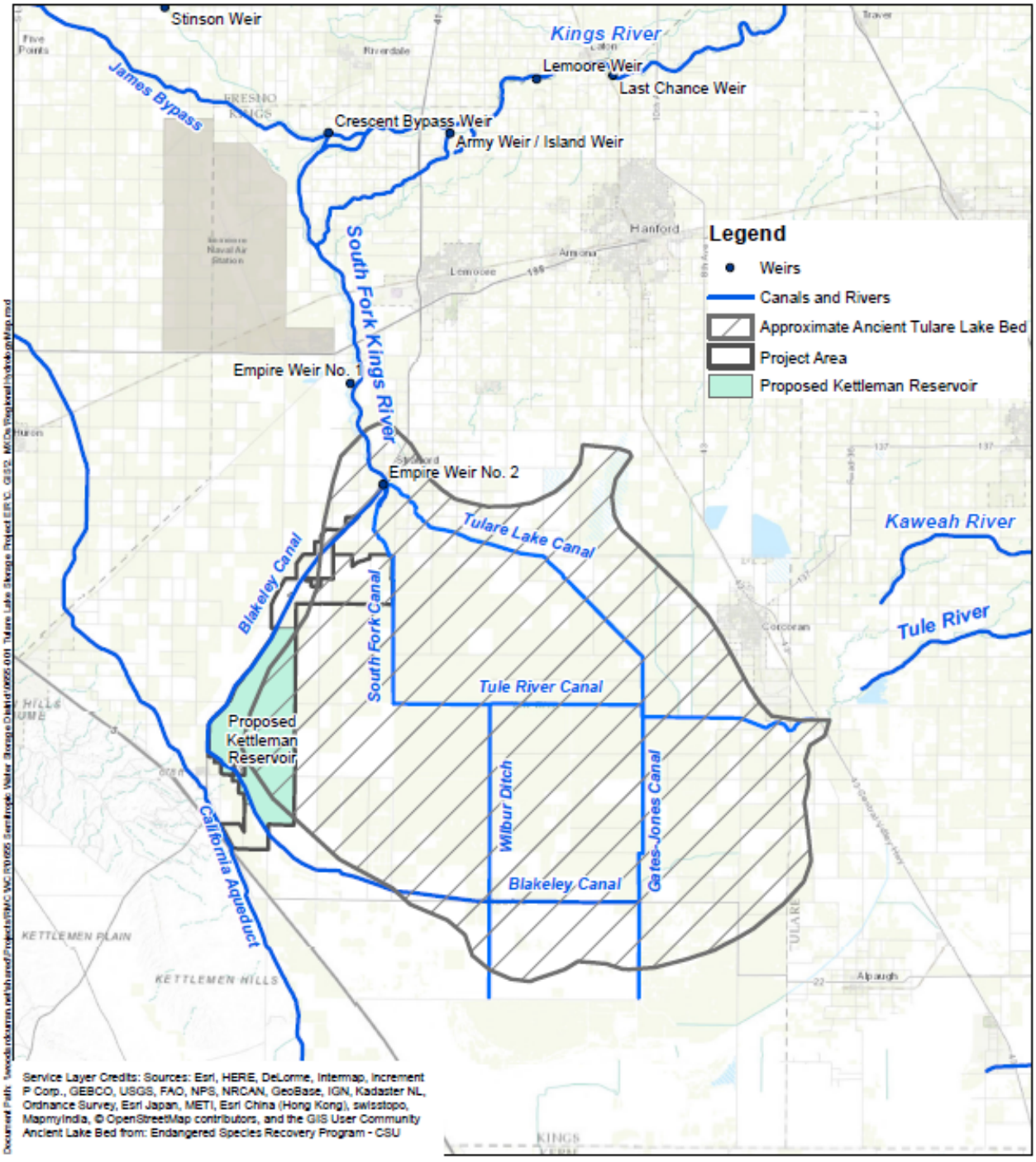
The Kaweah River is a 59-mile long river originating high in the western slopes of the southern Sierra Nevada. It is the next river to the south of the Kings River and flows in a westerly direction. Historically, the Kaweah River Basin is a closed system, terminating at Tulare Lake. The main branch of the Kaweah River contains the Terminus Dam, which was completed in 1962 by the USACE for flood protection and irrigation water supply purposes. Downstream of Terminus Dam, the Kaweah River divides into many different creeks, canals, and ditches. A few canals and ditches maintain some connection between the Kaweah River and the Tulare Lake bed. Flows into the Tulare Lake area primarily occur in particularly wet years under flood conditions.

Tule River

The Tule River is the next river to the south of the Kaweah River. The Tule River is a 68-mile long river originating in the southern Sierra Nevada and flowing west toward the Tulare Lake bed. The Tule River Basin is made up primarily by three main forks: North, Middle and South Forks. The main branch of the Tule River contains Lake Success, which was created by construction of Success Dam by the USACE in 1961. The Porter Slough, near the City of Porterville and downstream of Lake Success, is a natural distributary used to convey irrigation water. Numerous additional canals, ditches, and other diversions exist along the river. Under "normal" conditions, surface water from the Tule River is entirely diverted. In particularly wet years and under flood conditions, water from the Tule River Basin flows into the Tulare Lake bed.

[1] a stream that branches off and flows away from a main stream channel

Figure 3.10-1: Regional Hydrology



Kern River

The Kern River is a 165-mile long river south of the Tule River. The Kern River originates in the western slope of the southern Sierra Nevada and flows primarily in a southwesterly direction. Historically, the river flowed into Buena Vista Lake and the now-dry Kern Lake. Under high flows or flood conditions, the Buena Vista and Kern Lakes would sometimes overflow into the Buena Vista Slough and flow into the Tulare Lake bed. The Kern River is now almost entirely diverted for agriculture, along with a substantial amount of infiltration into the Kern County Groundwater Subbasin in the Kern River alluvial fan. Though limited, a series of canals and irrigation ditches maintain some degree of hydrologic connection between the Kern River and the Tulare Lake bed.

Blakeley Canal

One water conveyance canal to the proposed Kettleman Reservoir would be the Blakeley Canal. The canal is owned and operated by Tulare Lake Reclamation District No. 761 (RD 761). The Blakeley Canal originates at Empire Weir No. 2 and conveys water southeasterly for approximately 30 miles.

South Fork Canal

Another water conveyance canal to the proposed Kettleman Canal and Kettleman Reservoir is the South Fork Canal which takes water from the South Fork of the Kings River downstream of Empire Weir No. 2. The canal flows from the terminus of the South Fork of the Kings River to a location past the Project's proposed diversion to the Kettleman Canal and approximately 10 miles south of Empire Weir No. 2 to the lowest point in the Tulare Lake bed. At that location, it intersects with the Tule River Canal from the east at a point approximately 12 miles west of the city of Corcoran. The canal is reportedly used by Lovelace Water Corporation for deliveries to its stockholders (KRCD/KRWA, 2009).

State Water Project (SWP)

The 444-mile long California Aqueduct is a critical part of the State Water Project and the primary conveyance structure that moves surface water from Northern to Southern California. The Aqueduct begins at the Harvey O. Banks Pumping Plant, and generally parallels Interstate 5 south to the Tehachapi Mountains. The Aqueduct varies in bottom width from 12 to 85 feet and has an average depth of 30 feet (WEF, 2017). About 30 percent of SWP water is delivered to San Joaquin Valley farms and cities via the Aqueduct. Just south of Kettleman City (and the Project area), the Coastal Branch separates from the Aqueduct to deliver water to Kern, Santa Barbara and San Luis Obispo Counties (WEF, 2017).

The Tulare Lake Basin Water Storage District (TLBWSD) owns the 15-mile Lateral A, which conveys SWP water from the California Aqueduct to an outfall just above Empire Weir No. 2. TLBWSD also owns the 8-mile Lateral B, located approximately 7 miles south of the Project area. TLBWSD began taking deliveries of SWP water in 1968. Since then, SWP deliveries have accounted for approximately 80 percent of the total average annual water supplies used within their service area (TLBWSD 2015). **Table 3.10-1,** from the TLBWSD's *2015 Agricultural Water Management Plan*, reflects the various surface water supplies delivered to TLBWSD for the Water Years 2000-2001 through 2013-2014.

Table 3.10-1: Surface Water Supplies Delivered within TLBWSD (Acre-Feet)

Water Year[1]	Flood Waters[2]	Local River Supplies[3]	State Water Project[4]	Other Surface Water[5]	Total
2000–2001	0	106,000	122,000	31,000	259,000
2001–2002	0	59,000	89,000	12,000	160,000
2002–2003	0	137,000	73,000	0	210,000
2003–2004	0	64,000	101,000	18,000	183,000
2004–2005	45,000	191,000	80,000	0	316,000
2005–2006	135,000	70,000	96,000	2,000	303,000
2006-2007	0	168,000	152,000	0	320,000
2007-2008	0	90,000	32,000	1,000	123,000
2008-2009	0	79,000	32,000	0	111,000
2009-2010	0	187,000	24,000	23,000	234,000
2010-2011	138,200	144,000	28,000	20,000	330,200
2011-2012	0	124,000	99,000	9,000	232,000
2012-2013	0	67,000	35,000	9,000	111,000
2013-2014	0	37,000	7,000	2,000	46,000
Total (AF)	**318,200**	**1,523,000**	**970,000**	**127,000**	**2,938,200**
% of Total	**10.8%**	**51.8%**	**33.0%**	**4.3%**	**100.0%**

Source: Tulare Lake Basin Water Storage District, Nov. 2015 Agricultural Water Management Plan Update
Notes:
1. October 1 through September 30.
2. Floodwaters from local rivers impounded in the Tulare Lake Bed or flood releases directly diverted from the rivers.
3. Local River supplies include Semitropic's and individual Water Users' water rights from the Kings and Tule Rivers.
4. SWP supplies include Table A, Carryover, Article 21, and Turnback Pool waters from the California Aqueduct.
5. Other Surface Waters include purchase, exchange, and transfer waters.

Surface Water Quality

The State and Regional Water Boards are conjunctively responsible for developing programs to monitor and protect surface water quality. In 2002, the State Water Boards developed a comprehensive surface water ambient monitoring program (SWAMP) that was designed to assess conditions of surface water throughout the State. While the State continues to administer the Program, the Regional Boards that have jurisdiction over their geographical regions are responsible for implementing the program. Data compiled from this program, as well as other State monitoring programs, is stored in a centralized database that is available to the public.

Primary objectives of the States monitoring programs are:

1) Evaluate water quality using consistent and objective monitoring, sampling and analytical methods; consistent data quality assurance protocols; and centralized data management.
2) Document ambient water quality conditions and characterize surface water quality as either maintaining beneficial uses or as impaired, with the scale of these assessments ranging from site-specific to watershed management area-wide.
3) Determine whether there is an association between land use and water quality impacts.
4) Coordinate and collaborate with internal and external monitoring efforts to leverage limited resources.

5) Provide data to evaluate overall effectiveness of water quality regulatory programs in protecting beneficial uses.

The CVRWQCB implements their program by comparing surface water quality against Water Quality Objectives contained in the *Water Quality Control Plan for the Tulare Lake Basin* (Basin Plan). As noted in the Basin Plan, surface water from the Kings River at Empire Weir No. 2 is considered to have agricultural, recreational, warm-water habitat, wildlife and groundwater beneficial uses. Water Quality objectives within this plan vary depending on ambient conditions and designated beneficial uses.

In addition to Basin Plan objectives, surface water pumped into the Aqueduct must meet drinking water standards established by Title 22 of the California Code of Regulations. Applicable limits are not consistently established between the various monitoring programs. To demonstrate water quality meets the proposed Project requirements, each of the established surface water quality standards will be addressed in this report with context for its applicability to the Project.

Kings River

The Lower Kings River, from Peoples Weir to Stinson Weir on the North Fork and Empire Weir No. 2 on the South Fork, is a Water Quality Limited Segment because of salinity. Studies indicate that the source of the salinity is either surface or subsurface agricultural drainage. Levels of boron, molybdenum, sulfates, and chlorides in the Lower Kings River are high enough to impact agricultural uses and aquatic resources (CVRWQCB, 2015). The Basin Plan river-specific water quality objectives for the Kings River include maximum electrical conductivity levels of 300 µmhos/cm (CVRWQCB, 2015).

Waters that do not meet standards are placed on the *303(d) List of Water Quality Limited Segments*, which identifies water bodies of impaired water quality. Impaired water body and beneficial use designations are evaluated by the Regional Board every five to 15 years. Their evaluation includes review of water quality data compiled through management plans such as Irrigated Lands Regulatory Program (IRLP) and SWAMP. Water quality goals are based on TMDLs and standards set in the Basin Plan. If water quality goals are achieved, the Regional Board can recommendation to the USEPA that contaminants are delisted from the 303(d) list; when all contaminants are delisted, the waterbody is no longer considered impaired. During the CVRWQCB's 2015 review, conductivity, molybdenum and toxaphene were not delisted based on the frequency of exceeding standards during the past 5-year monitoring period. Ammonia and *E. coli* were under consideration for new TMDL's; however, after further review of the data, listing these contaminants was not recommended. The USEPA approved each of the CVRWQCB's recommendations: therefore, 303(d) listing remains in effect for the Lower Kings River, Reach VI (from Island Weir to South Fork and Empire Weirs).

The SWAMP program coordinates all surface water quality monitoring conducted by the State and Regional Boards. Samples are collected directly by Regional Board staff as well as through collaborative partnerships such as ILRP. The purpose of this sampling is to monitor ambient quality, beneficial use protection, potential sources of impairment, and evaluate the effectiveness of the water boards water quality improvement policies. Monitoring plans implemented by the Regional Boards are designed to perform rotational watershed monitoring on a quarterly basis for one fiscal year of a 5-year period. However, due to contracting and/or staffing issues, quarterly sampling is not always conducted. Data are supplemented through the collaborative monitoring programs (ILRP, Safe to Swim, etc.). Several surface water monitoring sites exist on the South Fork Kings River; **Table 3.10-2** lists the sites that are representative to the Project and are considered in this analysis.

Table 3.10-2: Representative Surface Water Monitoring Sites on the Kings River (2002-2014)

Site Code	Site Description	Physical Description	Monitoring Program
552KIN900	Kings River South Fork@ Muir Rock	Reference Point	2008-2012: Safe to Swim 2012-2014 Safe to Swim and SWAMP
552KIN901	Kings River South Fork @ Hotel Creek and Cedar Grove	Reference Point ~5 miles South of Muir Rock	2008-2012: Safe to Swim 2012-2014 Safe to Swim and SWAMP
552KIN903	South Fork Kings River @ 180 & Cedar Grove	Reference Point ~6 miles South of Hotel Creek and Cedar Grove	2008-2012: Safe to Swim 2012-2014 Safe to Swim and SWAMP
551KIN065	Kings River at North 7th Ave Roads End	~3 miles South of Peoples Weir	2012-2013: SWAMP
551KIN060	Kings River at Laton-Kingston Park	~4 miles North of Island Weir	2012-2013: SWAMP
551LKI050	Kings River Lower – South Fork 2	Empire Weir No. 2	2002-2004: SWAMP baseline 2012-2014: SWAMP Rotation
551LKI040	Kings River Lower – South Fork	Between Island and Empire Weirs36.2558	2002-2004: SWAMP baseline 2008-2014: SWAMP Trends

There are three monitoring sites that serve as a reference point to the South Fork Kings River management plan. Reference points are locations that best represent water quality of a minimally-disturbed area within the river system. The site furthest upstream is Muir Rock, which is in Kings Canyon National Park on the Upper South Fork. This site is the furthest upstream monitoring location that is accessible by road. Two slightly downstream reference points are also used, depending on accessibility at the time of sampling. These minimally disturbed locations assume there are some anthropogenic stresses (swimming, fishing, boating, etc.), but in most cases, will represent natural, undisturbed conditions.

The CVRWQCB's monitoring program for the South Fork of the Kings River collected samples to establish baseline conditions during FY 2002-2003 and 2003-2004 (Sites 551LKI050 and 551LKI040). Reference point and trend monitoring samples were collected on a rotational basis between 2008 and 2014. Per the most recent SWAMP Annual Report, samples were collected for the baseline monitoring program from various points on the lower Kings River (below Pine Flat Reservoir) as it flows through the lower portion of the Kings Basin Management Area and eastern portion of the Tulare Lake Basin Watershed Management Area (CVRWQCB Staff Report, FY 02/03 and 03/04). The report identifies a number of samples that exceed the Basin Plan Water Quality Objective for conductivity (9 of 31); dissolved oxygen (5 of 30); ammonia (2 of 25); and the recommended pH range (6 of 31). The staff report aggregates sample results for long stretches of the lower Kings River, but Basin Plan Objectives are specified based on USEPA designated reaches. Overall, baseline sampling shows that the Kings River experiences localized water quality challenges. Samples from Reach VI of the Kings River (Sites 551LKI050 and 551LKI040) represent the project area:

Table 3.10-3 summarizes this data collection and samples from Reach VI that that did not meet the Central Valley Basin Plan objectives for municipal, agricultural and aquatic life beneficial uses. Sample results from Reach VI follow the same pattern of localized exceedances that do not correlate with upstream or downstream sample. Closer review of the sample location and depth for each sampling event indicates that these variations are related to sampling shallow or very low-flow conditions; of the 2002 through 2004 data reviewed, exceedance typically occurred when samples were collected from the "bank" of the river rather than "mid-channel" (CEDEN database).

Table 3.10-3: Summary of Basin Plan Objective Exceedances at Reach VI (2002-2004 Sampling)

Number of		Parameter (units)	Range of Detections	[1]Basin Plan Objective	Limit
Samples	Exceedances				
14	6	[2]Conductivity (µS/cm)	41 - 1670	300	[3]900-1600 [4]1000
14	2	[5]Dissolved Oxygen (mg/L)	2 - 11	7	n/a
14	8	[5]Ammonia (µg/L)	6 - 710	25	n/a
14	1	pH (units)	7.8 – 9.0	6.5 – 8.5	n/a

Notes:
1. Objectives for Reach VI of South Fork Kings River (Island Weir to Empire Weir).
2. Conductivity results are based on field measurements.
3. Recommended (900) and upper limit (1600) of Title 22 secondary standards.
4. Tulare Lake Water Quality Control Plan Basin Limit.
5. Limit applies exclusively to aquatic life protection.

Samples collected through the SWAMP program are limited to field analyses (temperature, pH, conductivity and dissolved oxygen); and lab analyses for nitrogen species (ammonia, Total Kjeldahl Nitrogen, and nitrite/nitrate), phosphorus and bacteria. This limited water quality assessment is used to characterize water quality compared to designated beneficial uses. Conductivity represents municipal and agricultural uses while dissolved oxygen and ammonia represent aquatic life benefits.

Additional water quality data were collected by the Kings River Integrated Regional Water Management (IRWM) Region and the Irrigated Lands Regulatory Program. These sampling programs are intended to evaluate potential degradation from agricultural land uses, and follow sampling criteria consistent with SWAMP and the SWRCB *Standard Operating Procedures for Conducting Field Measurement and Field Collections of Water*. These programs sample more frequently and consistently than the SWAMP program, and test for an expanded list of parameters that includes general minerals and inorganic chemicals. A 2007 study conducted by the Kings IRWM notes that surface water on the South Fork of the Kings River sometimes has high conductivity values and elevated levels of other constituents. As a result of these collective sampling programs, the Lower Kings River is listed on the Clean Water Act Section 303(d) list as impaired for conductivity, molybdenum and toxaphene.

The inconsistency in sample results from the various monitoring programs appears to be related to sampling at times when water is either stagnant or during very low-flow conditions. In an effort to characterize water quality that is representative the Tulare Lake Project's flow conditions, GEI Consultants (GEI) implemented a sampling program on behalf of Semitropic. Findings from this sampling program indicate that the Lower Kings River conveys high-quality water during flood flow conditions. GEI's sampling is summarized in Section 3.10.3, Operation; a Technical Memorandum that includes sample results and water quality analysis is presented in Appendix H.

State Water Project

California Aqueduct water quality typically resembles the quality of the water pumped into the Aqueduct at the headworks located at Clifton Court Forebay and Banks Pumping Plant, and then changes in quality throughout the Aqueduct through the introduction of groundwater via a series of Pump-In Projects. These projects operate in accordance with California Water Code which states that non-project water may be conveyed, wheeled, or transferred in the SWP provided that water quality is protected. The acceptance of turn-in water is through established agreements with DWR's State Water Project Analysis Office (SWPAO). These agreements between SWPAO and pump-in entities include water quality criteria among other aspects. These water quality criteria dictate that a pump-in entity of any non-project water program

must demonstrate that the water is of consistent, predictable, and acceptable quality prior to pumping the local groundwater into the SWP. Since there cannot be any adverse impacts to SWP water deliveries, operations or facilities, the water quality criteria cannot constrain DWR's ability to operate the SWP for its intended purposes or to protect its integrity during emergencies. The pump-in volumes and water quality are monitored regularly when approved pump-in entities are introducing local groundwater into the SWP (DWR, 2017). Water in the California Aqueduct is a raw water source and must be treated and filtered before it can be used as a potable supply.

The constituents of concern that are currently stipulated in pump-in contracts into the California Aqueduct include arsenic, bromide, chloride, total chromium, hexavalent chromium, conductivity, nitrate, sulfate, total or dissolved organic carbon, TDS, uranium, and gross alpha (DWR, 2016).

Blakeley Canal

The Blakeley Canal is owned and operated by RD 761. Sources of supply to the canal have historically included King River water. To a lesser degree, in the past, secondary-treated wastewater from Kettleman City and possibly the City of Lemoore Olam Processing Plant was transported through the canal along with the other water supplies. The two wastewater dischargers are regulated under the State Water Resources Control Board's Waste Discharge Requirements (WDR) Program. Kettleman City Sanitary District was issued its WDR (Order No. 79-143) from the Central Valley Regional Water Quality Control Board (CVRWQCB) in 1979, while the City of Lemoore wastewater treatment facility (WWTF) was issued its WDR (Order No. 96-050) in 1996.

Data on water quality produced by the Lemoore wastewater treatment plant is not publicly available, but the Basin Plan mandates that discharges shall not exceed conductivity of 1,000 μS/cm, chloride of 200 mg/L, and boron of 1 mg/L. The 1996 WDR states that per the permit, groundwater is used to dilute the wastewater effluent (conductivity ranges from 600 to 1200 μS/cm). Wastewater dilution ranges from 2:1 to 25:1 (canal water:wastewater effluent). The extent of historical Lemoore wastewater discharges into the canal (if any) is not clear.

Similar to the City of Lemoore, data on water quality of effluent produced by the Kettleman city plant is not publicly available so the best estimate of effluent quality is compliance with the Basin Plan mandates (CVRWQCB 2016). Discharges from wastewater treatment plants to the Blakeley Canal have ceased and are no longer physically possible. The City of Kettleman's outfall to the Blakeley Canal has recently been capped and sealed, and the Sanitary District now discharges to a ditch 250 feet away from Blakeley Canal, where there is no opportunity for the discharge to commingle with Blakeley Canal water.

Per a Memorandum of Letter Agreement between Semitropic and Howe Family LP, Sandridge Partners LP, Westlake Farms, Inc., Westlake Grain & Cotton, Inc. and Priest Valley Cattle Company Westlake Farms, Inc., Westlake Grain & Cotton, Inc. and Priest Valley Cattle Company, Westlake Farms "…covenants that no County effluent will be used, released, conveyed or discharged on the [proposed Project] Property or on or through Project or Non-Project Facilities." (Law Offices of Young Wooldridge LLP, April 2017b). "Non-Project Facilities" include the Blakeley Canal. Moreover, Semitropic has been informed by representatives of the landowner, including Westlake Farms, Inc., that independent of the Project, the City of Kettleman and City of Lemoore effluent agreements are in the process of being re-negotiated, that any agreement will not permit effluent to be put in the Blakeley Canal, and the re-negotiation, if successful, will lead to new or revised WDRs.

Regional Hydrogeology

The proposed Project area overlies the southern portion of the Tulare Lake Subbasin of the San Joaquin Valley Groundwater Basin (DWR Bulletin 118 Basin number 5-22.12). Locally referred to as the Tulare Lake Groundwater Basin, the groundwater basin is bounded on the south by the Kings-Kern County line;

on the west by the California Aqueduct and the Tertiary marine sediments of the Kettleman Hills; on the east by the westerly boundaries of the Kaweah and Tule Groundwater Basins; and on the north by the southern boundary of the Kings Groundwater Subbasin. The southern half of the Tulare Lake Groundwater Basin (which contains the Project area) consists of lands in the former Tulare Lake bed in Kings County.

The Tulare Lake Groundwater Basin generally consists of a shallow aquifer and a deep aquifer separated by a low-permeability hydrogeologic formation known as the Corcoran Clay. Water-bearing formations in the basin consist of younger and older alluvium, flood-basin deposits, lacustrine and marsh deposits, and continental deposits. Younger Alluvium is heterogenous in nature and consists of interstratified discontinuous beds of unsorted to fairly well sorted clay, silt, sand and gravel. This unit is very permeable, but largely above the water table. The underlying Older Alluvium consists of poorly sorted lenticular deposits of clay, silt, sand, and gravel, which may be loosely consolidated to cemented. This formation is moderately to highly permeable and yields large quantities of water. Flood-basin deposits are relative impermeable silt and clay with some moderately to poorly permeable sand layers that can yield moderate amounts of water. Lacustrine and marsh deposits are reduced deposits of silt, clay, and fine sand, and generally comprise the Corcoran Clay. This layer varies from approximately 50 to 200 feet in thickness, and occurs at depths of 400 to 600 feet. Continental deposits underlie the Corcoran Clay, and consist of poorly sorted lenticular deposits of clay, silt, sand, and gravel, which are moderately to poorly permeable and yield variable quantities of water (DWR 2006).

Soils in the Project area are very deeply developed on nearly flat alluvial deposits and are typically somewhat poorly drained to poorly drained. The surface horizon is typically fine-grained, ranging from fine sandy loam to clay (Kings County, 2009), and are relatively impermeable, limiting direct recharge to the shallow aquifer.

Groundwater use in the Project area has historically been conjunctively managed with surface water to maximize surface water use for irrigation. Groundwater is used to augment irrigation supplies and for domestic use. Production wells typically extend below the Corcoran clay to an average depth of around 1,500 feet (Summers Engineering, 2012) due to the better water quality of the deeper aquifer, although shallow groundwater (above the Corcoran Clay) is also utilized in some areas.

In 1995, the Tulare Lake Basin Water Storage District and several other public entities and private landowners established the Tulare Lake Bed Coordinated Groundwater Management Plan (GWMP) under the provisions of Assembly Bill (AB) 3030. In July 2012, the AB 3030 plan was updated to Senate Bill (SB) 1938 standards. The main purposes of the GWMP are to preserve local management of groundwater resources and document the long-standing groundwater management practices and programs of the local landowners (Summers Engineering, 2012).

Groundwater Quality

Groundwater in the Tulare Lake Groundwater Basin is generally a calcium bicarbonate type in the northern area, trending towards a sodium bicarbonate type as it approaches the Tulare Lake bed. Due to the fairly impermeable soil in the area and the depth to usable groundwater, surface flow does not affect groundwater quantity or quality. The main groundwater quality concern is total dissolved solids (TDS), where values are typically in the 200 to 600 mg/L range, and can get as high as 40,000 mg/L in drainage problem areas. The high concentration of salts has precluded the use of the groundwater for irrigation or municipal uses (Summers Engineering 2012). Other groundwater quality impairments include localized areas of high arsenic and reports of odors in the city of Hanford caused by hydrogen sulfide (DWR 2006).

3.10.2 Regulatory Framework

Federal Policies and Regulations

Clean Water Act (CWA)

Originally titled the Federal Water Pollution Control Act of 1972, the CWA is administered by the U.S. Environmental Protection Agency (USEPA). The CWA allowed the USEPA to delegate the National Pollutant Discharge Elimination System (NPDES) Permit Program to state governments, enabling states to perform many of the permitting, administrative, and enforcement aspects of the NPDES Program. In California, these functions are performed by the State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards. The CWA serves as the primary federal law protecting the quality of the nation's surface waters, including lakes, rivers, and coastal wetlands. The CVRWQCB has jurisdiction over the Project area as well as over the entire lengths of the Kings, Kaweah, Tule, and Kern Rivers.

Section 303(d)

CWA Section 303(d) requires states to develop lists of water bodies that will not attain water quality standards after implementation of technology-based effluent limitations by point-source dischargers. Section 303(d) further requires states to develop a Total Maximum Daily Load (TMDL) for each of the listed pollutants and water bodies. A TMDL is the amount of pollutant loading that the water body can receive and still meet water quality standards.

In 2011, the EPA gave final approval to a revised list of impaired water bodies (hereinafter referred to as the 303(d) list) prepared by the State. The Lower Kings River is listed for conductivity, molybdenum, and toxaphene on Reach VI, the stretch from Island Weir to Empire Weir, but TMDLs are still needed (SWRCB 2010). These listings are based on decisions made prior to 2006; however, the decision has not changed. As cited in Decision ID 6974 Line of Evidence, 11 of 38 conductivity samples collected by SWAMP exceeds the evaluation objective. Consequently, Reach VI of the Kings River remains listed.

Molybdenum is a naturally occurring element found in soils throughout the Central Valley. The listing decision for molybdenum in the Kings River has not changed from the 2006 decision because the CVRWQCB has not gathered any new data to assess it. Toxaphene is an insecticide that was banned in 1990 and remains listed because there are not sufficient data to assess its listing status. While 19 samples were collected from the Kings River and all results were non-detect, none of the samples used a method detection limit below the California Toxics Rule criteria concentration.

The Lower Kings River (Pine Flat Reservoir to Island Weir) is listed for the pesticide chlorpyrifos and unknown toxicity (statistical analysis to estimate the negative impacts on aquatic life). Deer Creek (a tributary of the Kings River) is listed for high pH and unknown toxicity. Corresponding TMDLs have an estimated completion date of 2021.

As discussed in the King River Water Quality section of this Draft EIR, contaminants are intermittently detected in various reaches of the River and tend to be localized. Detections for a single contaminant are typically not found at upstream or downstream sample sites. The SWRCB's sampling Standard Operating Procedures (SOP) requires sampling when 8-inches of standing water is present which may contribute to inconsistency in contaminant detections.

Section 401

Section 401 of the CWA allows for evaluation of water quality when a proposed activity requiring a federal license or permit which could result in a discharge to waters of the U.S. Compliance with Section 401 is required for all projects that have a federal component and may affect water quality, including projects that

require a 404 Permit from the U.S. Army Corps of Engineers. See *Section 3.5 Biological Resources* for further discussion of CWA Section 401.

Section 402

Section 402 of the CWA specifically required USEPA to develop and implement the NPDES program. In California, the USEPA authorizes the SWRCB to oversee the NPDES program through the Regional Water Quality Control Boards. There are two types of NPDES permits relevant to the Proposed Action. An NPDES permit would be needed for discharge of pollutants to Waters of the State or U.S., and NPDES General Waste Discharge Requirements approval would also be required to discharge dewatering and other low-threat discharge to surface waters. These NPDES permits are described further below.

- *General Permit for Discharges of Storm Water Associated with Construction Activity* In 2009, the SWRCB adopted an amended *General Permit for Discharges of Storm Water Associated with Construction Activity,* NPDES Order No. CAS000002, Order No. 2009-0009-DWQ (Construction General Permit). Effective July 1, 2010, the amended General Construction Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP must list best management practices (BMPs) the discharger will use to protect storm water runoff; a visual monitoring program; a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment (Note: the proposed Project would not discharge to a water body that is 303(d)-listed for sediment.) Because the proposed Project would disturb more than one acre of land, coverage under the General Construction Permit and development of a SWPPP would be required.
- *Waste Discharge Requirements for Dewatering and Other Low Threat Discharges to Surface Waters.* On May 31, 2013, the CVRWQCB Order R5-2013-0074, NDPES No. CAG995001. Individuals, public agencies, private businesses, and other legal entities discharging relatively pollutant-free wastewaters that pose little or no threat to the quality of surface waters, for a duration of either four months or less in duration or have an average dry weather flow less than 0.25 MGD, may obtain authorization under this General Order to discharge. This General Order covers certain categories of dewatering and other low threat discharges to waters of the U.S.

Section 404

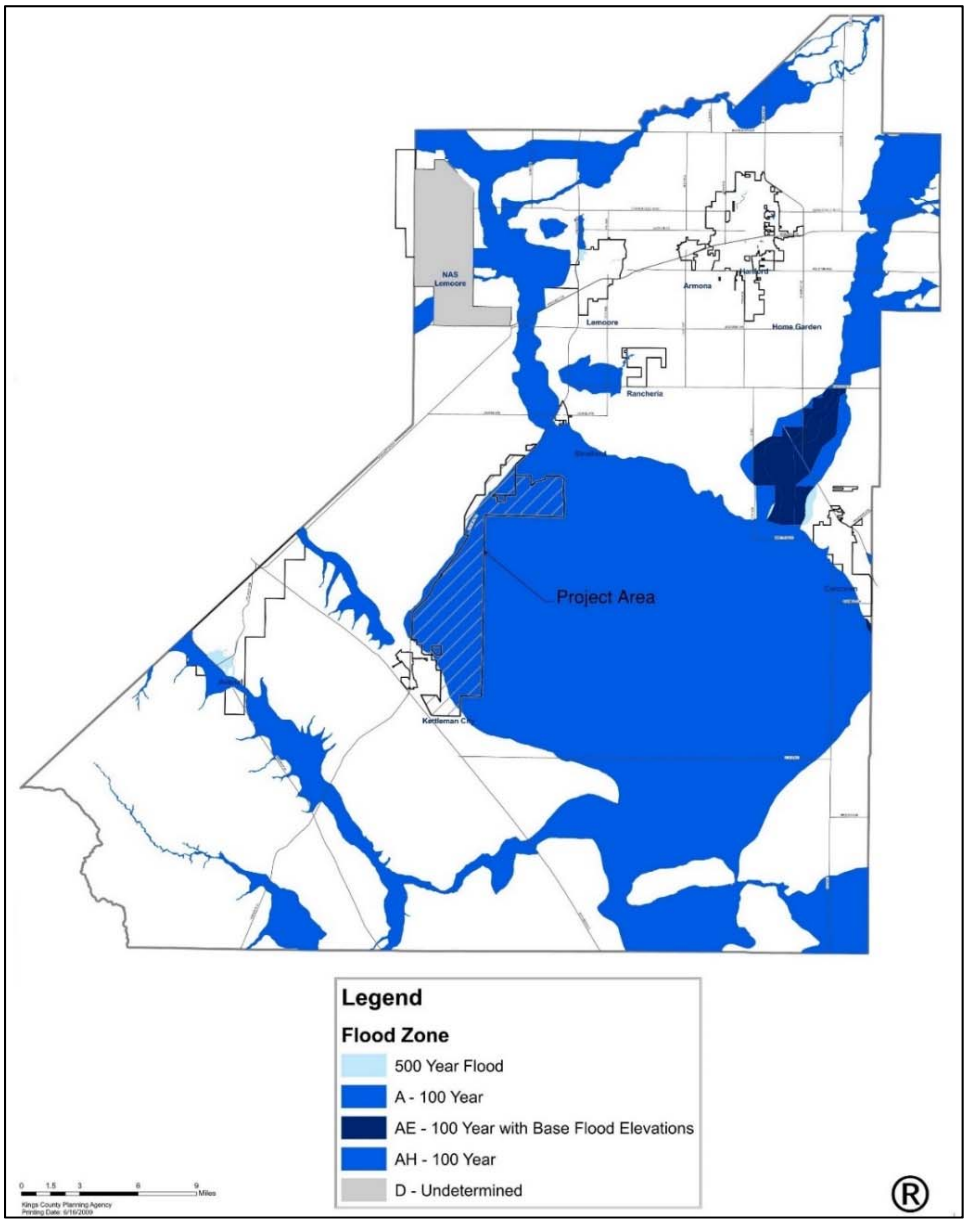
CWA Section 404 regulates the discharge of dredged and fill materials into Waters of the U.S. Areas meeting the regulatory definition of Waters of the U.S. are subject to the jurisdiction of the U.S. Army Corps of Engineers (USACE) under provisions of CWA Section 404. Construction activities involving placement of fill into jurisdictional Waters of the U.S. are regulated by the USACE through permit requirements. No USACE permit is in effect in the absence of state water quality certification pursuant to Section 401 of the CWA. See *Section 3.5 Biological Resources* for further discussion of CWA Section 404.

National Flood Insurance Program (NFIP)

The NFIP was created to promote flood awareness and reduce flood losses of properties within Special Flood Hazard Areas. Drainage and related flooding hazards are managed in response to requirements established by the National Flood Insurance Act of 1986 and the Flood Disaster Protection Act of 1973, as amended. Requirements of the NFIP are included in the Building Code and through overall city and interagency programs for flood management. In implementing NFIP, the Federal Emergency Management Agency (FEMA) requires that new construction in a flood hazard area meet minimum design standards to place occupied structures above flood hazard areas.

Figure 3.10-2 shows the FEMA flood zones within Kings County.

Figure 3.10-2: Kings County FEMA Flood Zone



Source: Kings County Planning Agency (2009).

State Policies and Regulations

The proposed Project is within the jurisdiction of the Central Valley Regional Water Quality Control Board, which governs many of the regulations associated with water supply, wastewater, and storm drainage. The Regional Water Quality Control Boards administer regulations related to discharges under the Federal Water Pollution Control Act of 1972 (CWA), as amended, and the Porter-Cologne Water Quality Control Act.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act is California's statutory authority for the protection of water quality. Under this act, the State must adopt water quality policies, plans, and objectives that protect the State's waters. The act sets forth the obligations of the SWRCB and Regional Water Quality Control Boards pertaining to the adoption of Basin Plans and establishment of water quality objectives. Unlike the CWA, which regulates only surface water, the Porter-Cologne Act regulates both surface water and groundwater.

The Basin Plan (CVRWQCB 2015) is designed to preserve and enhance water quality and protect the beneficial uses of all regional waters. Specifically, the Basin Plan:

1) Designates beneficial uses for surface and ground waters;
2) Sets narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to the state's antidegradation policy;
3) Describes implementation programs to protect the beneficial uses of all waters in the Region; and
4) Describes surveillance and monitoring activities to evaluate the effectiveness of the Basin Plan [California Water Code Sections 13240 thru 13244, Section 13050(j)].

The Basin Plan is used as the regulatory authority for water quality standards established in local NPDES permits and other CVRWQCB decisions. The Basin Plan for the Tulare Lake Basin designates beneficial uses for the South Fork of the Kings River (to Empire Weir No. 2), the Tule River (below Lake Success), the Kern River (below Southern CA Edison Kern River Powerhouse No. 1), Poso Creek, and the Tulare Lake Basin.

The Basin Plan was last revised by CVRWQCB in July 2016. It lists water quality objectives for both inland surface waters and groundwater. As stated in the Basin Plan, the greatest long-term water quality concern of the Tulare Lake Basin region is the increase of salinity in both surface and groundwater. Other water quality objectives apply for chemical constituents (dependent on local beneficial use classification), bacteria, pesticides, and radioactivity. Objectives to protect the beneficial uses of inland surface waters apply to the following constituents: chemical constituents (dependent on local beneficial use classification), ammonia, bacteria, biostimulatory substances, color, dissolved oxygen, floating material, oil and grease, pH, pesticides, radioactivity, salinity, sediment, settleable and suspended material, tastes and odor, temperature, toxicity, and turbidity.

Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act of 2014 (SGMA) is a comprehensive three-bill package (SB1168, SB1319, and AB1739) that provides a framework for the sustainable management of groundwater basins by local authorities, which became effective January 1, 2015. SGMA requires the development and implementation of groundwater sustainability plans (GSPs) for medium- and high-priority basins. The GSPs must contain measurable objectives and actions to bring a groundwater basin into and maintain groundwater sustainability, and to avoid undesirable results (e.g., chronic lowering of groundwater levels indicate a significant and unreasonable depletion of supply if continued over the planning and implementation horizon, significant and unreasonable land subsidence that substantially interferes with surface land uses). SGMA also required the establishment of groundwater sustainability agencies (GSAs) by June 30, 2017 to oversee development and implementation of GSPs, and provides authority to GSAs to sustainably manage groundwater. Under SGMA, the Tulare Lake Groundwater Basin is a high-priority groundwater basin and is classified as being in critical over-draft condition. Per the SGMA deadline, the Southwest Kings Groundwater Sustainability Agency was formed for the portion of the Tulare Lake Groundwater Basin underlying the proposed Project. This GSA is a joint powers authority formed by

Dudley Ridge Water District, Tulare Lake Reclamation District No. 761, Tulare Lake Basin Water Storage District, Kettleman City Community Services District and the County of Kings.

California Water Code Section 1810

According to California Water Code Section 1810, no agency may deny a transferor of water the use of water conveyance, which has unused capacity, if fair compensation is paid and provided that the comingled water does not result in a diminution of water quality. The transfer must also be made without unreasonably affecting fish, wildlife, or other instream beneficial uses. DWR has established procedures and criteria for adding Non-Project water into the State Water Project through the *Water Quality Policy and Implementation Process for Acceptance of Non-Project Water into the State Water Project* (DWR 2012).

Local Policies and Regulations

Kings County General Plan

The Kings County General Plan (Kings County, 2010e) guides development for the county within a 20-year planning horizon. The Land Use Element, Resource Conservation Element, and Health and Safety Element include policies that are applicable to hydrology and water quality in the project area.

Land Use Element

The Kings County General Plan, Land Use Element (Kings County, 2010f) designates the general distribution, location, and intensity of land uses throughout the unincorporated territory of the County, and establishes land use policies to guide and direct future land use decisions and development. The Land Use Element includes the following goals addressing hydrology and water in the Project Area under the Natural Lands section of the Land Use Element.

- *LU Objective A1.2: Protect natural waterways to ensure continued water delivery and recharge to surrounding agricultural uses and related homesites, while maintaining the natural aesthetic appeal of the Kings River and Cross Creek waterway channels.*
- *LU Policy A1.2.1: Water channels and riparian habitat along the Kings River and Cross Creek shall be designated "Natural Resource Conservation" with a minimum parcel size the same as the surrounding agricultural zone, i.e. AG-20, AG-40, or AX. This designation shall include the natural water channel and outer edge of the riparian vegetation, or to the exterior toe of the bank of the channel where absent of vegetation.*
- *LU Policy A1.2.2: Natural Resource Conservation designated areas along waterways shall allow irrigation, flood control and drainage facilities as "Permitted Uses."*
- *LU GOAL B6 Agricultural areas provide secondary benefits by serving as essential public safety buffers for strategic military installations and floodwater drainage, and serve to protect the wellbeing of residents and business investments which are critical to the sustainability of the County*
- *LU OBJECTIVE B6.2 Identify agricultural areas that may serve as emergency floodwater storage or drainage areas.*
- *LU Policy B6.2.1: Flood zones within the General Agriculture designations shall be considered appropriate land use areas that have the potential to receive emergency floodwater. Specific basin sites shall be determined by the relevant water, irrigation, reclamation or flood control district having authority over territories along waterways and the Tulare Lake Basin.*

Resource Conservation Element

The King County's Resource Conservation Element (Kings County, 2010i) identifies natural resources throughout the county and establishes guiding policies for the conservation, development and utilization of these resources. The Resource Conservation Element includes the following goals relative to hydrology and water quality:

- *RC GOAL A1 Beneficially use, efficiently manage, and protect water resources while developing strategies to capture additional water sources that may become available to ensure long-term sustainable water supplies for the region.*
- *RC OBJECTIVE A1.1 Maintain and Protect Existing Water Supplies.*
- *RC Policy A1.1.1: Cooperate with water purveyors and water management agencies to manage groundwater resources within the County to assure an adequate, safe and reliable groundwater supply for existing and future water users.*
- *RC Policy A1.1.3: Discourage the net export of groundwater and surface water resources currently allocated to water users within Kings County.*
- *RC Policy A1.1.5: Encourage and support regional groundwater management strategies such as an Integrated Regional Water Management Plan.*
- *RC Policy A1.1.6: Support expansion of joint management of surface water and groundwater supplies that contributes to the protection, reliability and sustainability of local and regional water supplies.*
- *RC OBJECTIVE A1.3 Secure additional water supply sources to meet current and future water demand.*
- *RC Policy A1.3.1: Participate with and encourage all state, regional and local efforts to develop new or expanded water supplies that may serve Kings County.*
- *RC OBJECTIVE A1.4 Protect the quality of surface water and groundwater resources in accordance with applicable federal, state and regional requirements and regulations.*
- *RC Policy A1.4.2: Monitor and enforce provisions to control water pollution contained in the U.S. EPA National Pollutant Discharge Elimination System (NPDES) program as implemented by the California Water Quality Control Board, Central Valley Region.*
- *RC Policy A1.4.3: Require the use of feasible and cost-effective Best Management Practices (BMPs) and other measures designed to protect surface water and groundwater from the adverse effects of construction activities and urban and agricultural runoff in coordination with the California Water Quality Control Board, Central Valley Region.*
- *RC Policy A1.4.4: Encourage and support the identification of degraded surface water and groundwater resources and promote restoration where appropriate.*
- *RC OBJECTIVE A1.6 Protect groundwater quality by applying development standards which seek to prevent pollution of surface or groundwater and net loss of natural water features.*
- *RC GOAL A2 Protect natural waterway channels that serve as part of the County's critical floodwater conveyance system.*
- *RC OBJECTIVE A2.1 Maintain the existing Kings River water conveyance system as a designated floodway, and encourage the preservation of riparian habitat along the Kings River consistent with state and federally mandated flood control purposes.*

Health and Safety Element

The King County's Health and Safety Element (Kings County, 2010b) is intended to reduce or eliminate long term risk to people and property from natural or man-made hazards. The Health and Safety Element includes the following goals relative to hydrology and water quality:

- *HS GOAL A1 Preventative measures reduce the potential impacts of natural hazards upon people's lives, property, and the environment.*
- *HS Policy A1.4.2: Update the Kings County Flood Damage Prevention Ordinance as new flood information and/or relevant 2009 changes to FEMA references occur, including new FEMA digital flood insurance rate maps.*
- *HS OBJECTIVE A3.1 Prepare for long term countywide drought conditions by encouraging water conservation measures among urban, rural, and agricultural users, and increase regional water storage capacity to enhance groundwater recharge and capture of floodwater.*
- *HS Policy A3.1.1: Support the continued coordinated efforts of the Kings County Water Commission to seek countywide solutions to the ongoing water supply challenges facing urban, rural and agricultural water users within the County.*
- *HS Policy A3.1.2: Improve coordination, planning, and investment in long-term water supplies to meet demands of ongoing growth and development.*
- *HS GOAL A4 Prevent unnecessary exposure of people and property to flood damage.*
- *HS Policy A4.1.2: Reserve FEMA designated flood hazard areas for agricultural and natural resource conservation uses along the floodway channels and Tulare Lake Basin.*
- *HS Policy A4.1.5: Regulate development, water diversion, vegetation removal, and grading to minimize any increase in flood damage to people and property.*
- *HS Policy A4.1.8: Enforce the "Kings County Flood Damage Prevention Ordinance," Chapter 5A of the Kings County Code of Ordinances.*

3.10.3 Impact Analysis

Methodology for Analysis

This section evaluated whether construction and O&M of the facilities associated with the proposed Project would result in significant impacts related to hydrology and water quality. The analysis is based on a review of the hydrology and water quality studies referenced herein that have been developed for the proposed Project.

Thresholds of Significance

For the purposes of this analysis, an impact to hydrology and/or water quality would be significant if the Project would:

- Violate any water quality standards or waste discharge requirements.
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site.

- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site, including as a result of a levee breach and/or expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.
- Substantially alter the flows in a stream or river resulting in significant changes to flow patterns in downstream rivers and/or the Delta.
- Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff or otherwise substantially degrade water quality.
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.
- Place within a 100-year flood hazard area structures which would impede or redirect flood flows.
- Inundation by seiche, tsunami, or mudflow.

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to actions associated with the proposed Project are identified below along with a supporting rationale as to why further consideration is unnecessary and a no-impact determination is appropriate.

- *Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map* – the improvements associated with the proposed Project would not include construction of housing. Additionally, the Project would likely reduce the risk of flooding within the existing 100-year flood hazard area rather than add to it.
- *Result in inundation by seiche, tsunami, or mudflow* –The risk of tsunami in the project area is low enough that California Department of Conservation does not publish a tsunami inundation map for Kings County and all other counties not bordering the Pacific Ocean or the San Francisco Bay. The probability of a seiche occurring in the Kings River is considered minimal as seiches, rare in any circumstance, generally occur only in lakes and enclosed seas.

Impacts and Mitigation Measures

This section discusses potential impacts to hydrology and water quality that could result from construction and O&M of the proposed Project. Mitigation measures are identified where appropriate.

Impact HYD-1 Exceed Any Water Quality Standards or Waste Discharge Requirements Issued by the Central Valley Regional Water Quality Control Board and/or California Department of Water Resources or Otherwise Substantially Degrade Water Quality

Construction

All Facilities

Construction of Project facilities would require excavation, grading and recontouring of soils at the Project area. During these activities, sedimentation in storm runoff and loss of topsoil could occur if soils are exposed to high winds or heavy precipitation. In addition, construction activities would require the use of hazardous materials including but not limited to petroleum products and automotive fluids. Any inadvertent spills or leaks could inadvertently affect the quality of runoff water. However, construction of Project facilities would comply with water quality standards and waste discharge requirements issued by the CVRWQCB. Coverage under the statewide construction storm water permit would be obtained from

CVRWQCB (Section 402 Clean Water Act). In this regard, a SWPPP would be prepared and submitted that would identify pollutant sources that may affect the quality of storm water discharges and identify BMPs, such as erosion control and pollution prevention measures, to be implemented during construction. In addition, for dewatering during construction and for pipeline discharges for testing and startups, coverage would be obtained from the CVRWQCB under the General Order for low-threat discharges. Construction water would be contained and disposed of in accordance with the permits and as described in the Project's SWPPP. This would ensure that water quality is not degraded during construction of project facilities.

Implementation of **Mitigation Measure HYD-1**, preparation and implementation of a Storm Water Pollution Prevention Plan would ensure that construction operations would not release contaminants into the shallow groundwater zone. As such, the potential for exceeding of water quality objectives or wastewater discharge requirements during construction is less than significant.

Operation and Maintenance

All Facilities

The Project would capture and temporarily store primarily floodwaters from the Kings River system for beneficial uses and groundwater recharge and storage, including within Semitropic and the Semitropic Groundwater Bank. There are two proposed modes of operations as follows: 1) water would be diverted at Empire Weir No. 2 and conveyed approximately one mile southward in the existing South Fork Canal and diverted via the Kettleman Weir into the proposed Kettleman Canal for delivery to the Kettleman Reservoir and/or the Aqueduct Intertie and ultimately to the California Aqueduct; and 2) Water would also be diverted from Empire Weir No. 2 to the Blakeley Canal, diverted via gravity to the Kettleman Reservoir for ultimate conveyance to the Aqueduct Intertie and the California Aqueduct. Prior to introducing the water into the California Aqueduct, Semitropic would ensure that the water quality meets the DWR requirements through the implementation of **Mitigation Measure HYD-2**, preparation and implementation of a Comprehensive Water Quality Monitoring Plan that ensures that DWR's Pump-In Program agreement requirements are met.

As previously noted, the proposed Project could also be used to divert and temporarily store SWP water in the Kettleman Reservoir during periods of high flows for later conveyance back to the California Aqueduct. Depending on the volume of water stored in the reservoir, weather conditions at the time of storage and period of storage, the quality of stored water may change. To ensure that there are no impacts resulting from the reconveyance of this SWP stored water back to the California Aqueduct, **Mitigation Measure HYD-2** would again be implemented to ensure that DWR's Pump-In Program agreement requirements are met.

The Project would help improve water supply reliability for Semitropic and possibly other SWP customers downstream of the Project by capturing and temporarily retaining more wet-year water supplies. With respect to water quality impact assessment, in addition to meeting the Basin Plan water quality objectives, if the Project water is pumped directly into the Aqueduct, DWR requires that all water placed in the SWP meet water quality criteria as described in the Department of Water Resources *Water Quality Policy and Implementation Process for Acceptance of Non-Project Water Into the State Water Project* (Pump-In Policy), that dictate that a pump-in entity of any non-project water program must demonstrate that the water is of consistent, predictable, and acceptable quality prior to pumping into the SWP. These standards potentially include the requirement that turned-in water meet Title 22 drinking water standards for certain constituents (California Code of Regulations, Sections 64431-64439). Additionally, DWR regularly monitors the pump-in volumes and water quality to ensure that their water quality objectives are met.

To characterize the quality of floodwaters that may be diverted into the Project, a sampling program that takes advantage of the 2017 flood flow conditions on the Kings River was implemented (GEI Consultants, 2017d). This sampling program evaluated water quality during the 2017 flood flow conditions on the Kings

and Tule Rivers, which are representative of conditions under which the Project would be able to divert water once the Project is completed. Eight sampling events were conducted between February 16 and June 2017. In the assessment, the floodwater water quality (as sampled at Army Weir and Empire Weir No. 2) was compared to DWR's sample results from the Aqueduct at Check 21.

Data collected and the comparative analysis to Aqueduct water quality indicates that floodwaters conveyed through the proposed Project and pumped into the California Aqueduct will not degrade receiving water quality. Overall, the Kings and Tule Rivers convey high-quality water that either meets or exceeds applicable water quality standards. Sampling from Empire Weir No. 2 shows that water quality is not degraded through the proposed Project conveyance. Furthermore, the sampling program demonstrates that flood flows would meet the DWR Pump-in Policy since the water quality results demonstrate that the floodwater is of consistent, predictable and acceptable water quality. Overall, the Kings River conveys high-quality water that either meets or exceeds the applicable Title 22 constituents for drinking water standards. GEI's sampling program employed similar procedures to the State Water Boards SOP, except the minimum water level: The State Water Board requires sampling if there is at least 8-inches of standing water at the sample site, whereas GEI's sampling program required a minimum of 100-cfs of flowing water at the sample site. This criterion ensures that samples are representative of the potential Project.

Table 3.10-4 below summarizes relevant sample data from the sampling program. Constituents presented in this table are identified in the Tulare Lake Basin Plan, and are potential constituents of concern in a pump-in proposal. Water quality at each of the sampling stations is discussed below. A Technical Memorandum that details GEI's sampling program and water quality assessment is provided in Appendix H.

Table 3.10-4: Comparison of Water Quality to Project Floodwaters

Basin Plan Objectives	Aqueduct – Check 21 (DWR Receiving Water Quality)			Representative Project Water Quality						Title 22 MCL[1] or (SMCL)[2]
				Army Weir			Empire Weir 2			
Constituent	*Min*	*Avg*	*Max*	*Min*	*Avg*	*Max*	*Min*	*Avg*	*Max*	
Conductivity (µmhos/cm)	209	350	644	30	46	61	56	263	812	(900 – 1600)
Molybdenum (ppb)	n/a	n/a	n/a	1	1	2	1.6	5.3	15	NS
Sulfate (ppm)	22	28	34	1	2	3	67	65	250	(250 – 500)
TDS (ppm)	117	200	360	25	40	53	51	211	590	(500 – 1000)
Turbidity (NTU)	ND	9	13	2	6	11	2	12	24	NS for raw surface water
Selenium (ppb)	ND	0.2	1	0.5	0.6	0.8	0.5	0.6	0.6	50
Iron (ppb)	62	323	479	240	638	950	180	841	1,500	(300)
Dissolved Iron (ppb)	18	23	32	Sampled June 15		41	Sampled June 15		150	-
Aluminum (ppb)	30	289	465	180	520	850	140	574	1,000	(200), 1000
Dissolved Aluminum (ppb)	ND	ND	ND	Sampled June 15		53	Sampled June 15		140	-
Manganese (ppb)	10	35	57	9	19	28	18	31	60	(50)
Dissolved Manganese (ppb)	n/a	n/a	n/a	Sampled June 15		4	Sampled June 15		13	-

Notes:
1. Primary MCLs are health-based standards
2. Secondary MCLs address aesthetic concerns such as taste and odor. These limits are typically applied to treated water quality, not raw surface water.
3. Some Title 22 SMCLs are based on a range of consumer acceptance limits. Where a range is presented, the lower value is the recommended limit and the higher value is the recommended upper limit. These limits are strictly based on aesthetic concerns and are not typically applied to raw surface water. Ranges are provided in this table as a benchmark.
   ppm – parts per million
   ppb – parts per billion
   NTU - Nephelometric Turbidity Unit
   NS – no standard exists

In some samples, iron, manganese and aluminum levels exceed the drinking water secondary limit. These naturally occurring metals are likely present as particles in the soil. All samples with elevated concentrations follow a similar trend line with turbidity. High turbidity is caused by sediment carried by flood flows: to confirm this theory, samples collected on June 15 were analyzed for both total and dissolved metals. Total metals analysis includes the metals content that is both dissolved and in the water and present in the particulates suspended in the water. Sample results for dissolved metals are substantially lower than total metals, confirming that soil particles are the primary contribution of these naturally occurring metals. When water is diverted into the Project's reservoir cells, these particles will settle and naturally mitigate the levels of iron and aluminum found in the total metals analysis. Water

pumped into the Aqueduct is expected to contain levels comparable to the dissolved metals analysis, which is in-line with levels found at Check 21.

California Aqueduct

Semitropic currently pumps water from its existing Semitropic Groundwater Banking Program and SWRU into the California Aqueduct in accordance with a turn-in/turn-out agreement with DWR. As a result of this existing agreement, Semitropic has in-depth knowledge of stakeholder interests in maintaining high-water quality water in the Aqueduct. DWR's criteria for pumping into the Aqueduct is documented in their Water Quality Policy and Implementation Process for Acceptance of Non-Project Water into the State Water Project (2013). This policy explains DWR's two-Tier approach to evaluating proposals. Semitropic will use data gathered through GEI's sampling program to prepare a Tier 1 proposal, which exhibits water quality that is essentially the same, or better, than what occurs in the Aqueduct.

Table 3.10-4 above illustrates the existing water quality at Check 21 of the California Aqueduct, one of the closest monitoring locations to the proposed Project's tie-in locations, which reflects expected receiving water quality and also illustrates expected Project water quality as reflected in sampling at the Army Weir and Empire Weir 2. Water quality for the sampled Project locations is comparable, or better than, ambient water quality in the Aqueduct. While only a limited amount of data is presented in this report, GEI's sampling program tested for more than 170 parameters. Since many of the parameters are not detected or only found in negligible concentrations, the summary table focuses on parameters that either exceed drinking water limits or are known concerns for a Pump-in Proposal. When the complete set of sample results are compared against the Aqueduct data, water quality improvement may be demonstrated for some constituents. Implementation of **Mitigation Measure HYD-2**, Prepare and Implement a Comprehensive Water Quality Monitoring Plan, would further ensure that potential water quality impacts would be less than significant.

Tule River

As described in the GEI study, the Tule River is not a source of supply for the proposed Project, and is therefore not analyzed in terms of potential project impacts.

Tule River (upstream) sampling has indicated much higher concentrations of iron (a maximum of 3,100 ppb) and aluminum (up to 4,900 ppb) compared to that in the Aqueduct. In all four sample sets collected at this location, these metals are consistently over the Secondary Maximum Contaminant Level (SMCL) for iron (SMCL=300 parts per billion [ppb]) and the primary MCL for aluminum (MCL= 1,000 ppb). Turbidity levels were up to 46 NTUs; like samples in the Kings River, dissolved levels are substantially lower and comply with respective SMCLs. These results demonstrate that high turbidity is contributing to the elevated concentrations of iron and aluminum and will be naturally mitigated when the water is settled in the Projects reservoirs (GEI Consultants 2017a). **Mitigation Measure HYD-2** would prevent Project water with elevated concentrations of turbidity, iron, or aluminum from being pumped into the Aqueduct.

Lower Kings River

Designated beneficial uses of the Lower Kings River are limited to agriculture (AGR), water contact recreation (REC-1), non-contact water recreation (REC-2), warm freshwater habitat (WARM), wildlife habitat (WILD), and groundwater recharge (GWR). Based on water quality data reported in the State of the Watershed report for the Tulare Lake basin, Lower Kings River water quality is degraded during critically dry periods. However, the Project would capture floodwaters during wet years; thus, any existing degraded water quality would be improved with fresh water dilution.

Based on water quality data collected from 2002 to 2013 from 12 points along the Kings River, Tule River, Tulare Lake Canal, and the Ditch South of Utica Avenue, concentrations of conductivity, boron, chloride, selenium, and sulfate exceeded the Basin Plan water quality objectives in 10 out of 30 monitoring periods at the South Fork-Kings River monitoring locations. Data collected during 2011 and 2012 can be considered

representative of anticipated water quality during above average and critically dry periods, respectively. During 2011, when rainfall measured at the Stratford station and annual discharges from Pine Flat were significantly higher than the 10-year average, conductivity and molybdenum concentrations were below the standard except in March, when the relatively small discharge did not adequately dilute the concentrations. During 2012, which was a critically dry year, and a year in which flood water was not available for diversion and storage, conductivity and/or molybdenum exceeded water quality standards in three of nine sampling events in the months of April and May at the South Fork 2 and Empire Weir No. 2 sampling locations. As previously described, these exceedances may be more representative of site-specific stagnant water since the State requires sampling if 8-inches of standing water is present at the site. When sampling conditions represented flowing water, water quality improved and met all standards in all sampling events between July and September. However, as Pine Flat discharges are reduced in August and September, after the time when water is expected to be diverted to the Project, constituent concentrations begin to increase. Since water quality is demonstrated to improve during periods of high flow (as is proposed for project operations), **Mitigation Measure HYD-2** would ensure that the Project water quality objectives are met before Project water is pumped into the Aqueduct. With implementation of this mitigation measure, the Project would not be expected to cause exceedance of the water quality objectives in the Aqueduct, and this impact would be minimized to a less than significant level.

Army Weir and Empire Weir No. 2

GEI's water quality assessment included two sampling stations along the Lower Kings River, at Army Weir and Empire Weir No. 2. Water quality data trends from these two sample points were similar, and demonstrate that flows representative of the Project meets all Title 22 drinking water standards and will not degrade the Aqueduct. Total iron and aluminum concentrations at the weirs were elevated but dissolved samples showed substantially lower levels. At both weirs, it was noted that iron and aluminum concentrations increased with turbidity, appearing to indicate increased metal concentrations are linked with increased flows upstream and turbidity/sediment levels. Storage of these waters in the proposed Kettleman Reservoir, and lower flows in the proposed Kettleman Canal, would aid in sediment reduction resulting in consistent with the dissolved levels, which is in compliance with drinking water standards for treated water.

Based on data collected through the State Water Board's surface water monitoring programs, water quality varies considerably with flow and, at times, exceeds Basin limits. However, the Project would only divert surface water when water is flowing greater than 100 cfs. GEI's sampling programs demonstrates that, at this flow rate, Project water would meet required standards. With the implementation of **Mitigation Measures HYD-1 and HYD-2,** Project O&M would not exceed any water quality standards or waste discharge requirements.

Significance Determination before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure HYD-1: Storm Water Pollution Prevention Plan

Prior to beginning construction, a Notice of Intent to comply with the State's *General Permit for Discharges of Storm Water Associated with Construction Activity* would be filed and a Storm Water Pollution Prevention Plan prepared. Implementation of the SWPPP would minimize the potential for water quality impacts resulting from Project construction to a less than significant level.

Mitigation Measure HYD-2: Prepare and Implement a Comprehensive Water Quality Monitoring Plan

To protect the California Aqueduct's water quality from being impaired by pump-in of Project waters during Project operations, a comprehensive Water Quality Monitoring Plan shall be implemented. Prior to pumping Project water from the Project into the Aqueduct, the monitoring plan would require sampling of all constituents of concern as listed in the pump-in proposal agreements. Only if the applicable water quality standards are met will the water be pumped into the Aqueduct. If such water quality standards are not met, the floodwaters collected in the reservoir would either be left to evaporate or offered to nearby agriculture for other uses. Implementation of this mitigation measure will mitigate potential exceedances of applicable SWP water quality standards to a less than significant level.

Significance Determination after Mitigation

Less than significant.

Impact HYD-2 Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)

Construction

All Facilities

Construction of Project facilities would have no effect on the groundwater supplies as any project-related excavation would not reach the water table in the Project area, estimated to be approximately 300 or more feet below the ground surface. Additionally, construction would not interfere with groundwater recharge, resulting in a deficit in aquifer storage. Construction activities would not intercept groundwater bearing zones nor would groundwater be used as a water supply during construction. As such, impacts to the groundwater basin relative to groundwater depletion or recharge during construction are less than significant.

Operation and Maintenance

Storage Facility

The proposed Project is a storm water capture project, and is conceptually designed to capture water for delivery to Semitropic via the California Aqueduct. The soils in the Project area are fairly impermeable, as would be expected of lake bed soils, and loss of stored water into the groundwater basin within the Project area is anticipated to be negligible. An analysis was conducted of the proposed Project to estimate the potential effects of seepage on the groundwater levels adjacent to the proposed Project (GEI Consultants, 2017d). Given that the proposed operation of the Project includes storage of up to approximately 30,000 AF depending on levee heights, there is a potential for seepage of water.

Based on the initial seepage analysis performed for the Project, the water table on the landward side of the reservoir is not expected to significantly change during periods of storage in the reservoir. Due to the fairly impermeable soils anticipated at the reservoir site, the underseepage flux is estimated to be approximately 1.2 ft^3/day per foot of embankment, and the associated potential rise in the groundwater table due to seepage from the Project storage reservoir is expected to be approximately 0.6 feet at the toe of the levee, declining to 0 feet at a distance approximately 500 feet from the toe of the levee. Because the Project would operate, on average, three out of every 10 years, this groundwater elevation rise would be temporary in nature, would only occur when the reservoir was full, and is within the range of natural groundwater elevation fluctuations and is therefore considered to be less than significant. Furthermore, operation of the Project facilities would

not significantly reduce groundwater storage capacities nor interfere substantially with existing groundwater recharge.

Conveyance Facilities

The existing Blakeley and South Fork Canals are unlined conveyance facilities. The proposed Kettleman Canal will also be an unlined facility. As such, these three conveyance facilities will be subject to a loss in flow due to seepage during Project operations. The underlying soils are similar throughout the Project area, with seepage losses in the three canals being similar to the projected seepage losses at the Kettleman Reservoir site.

There will also be increased groundwater seepage in the South Fork Kings River from the point of diversion at Army Weir to the point where the South Fork enters the historic Tulare Lake, which is approximately at the location of Empire Weir No. 2. Utilizing historic data and analyses of California Central Valley Groundwater-Surface Water Simulation Model (C2VSim) results, the seepage loss in the South Fork Kings River from Army Weir to Empire Weir No. 2 is estimated to be approximately 8 to 12 percent. Assuming a seepage loss rate of up to 10 percent, the average annual seepage loss could be up 12,000 AFY (up to 10 percent of the average annual diversion of up to 120,000 AFY).

Reductions in seepage from the James Bypass to the regional groundwater basin are expected to occur during periods of flood flows in the James Bypass. Utilizing historic data and analyses of California Central Valley Groundwater-Surface Water Simulation Model (C2VSim) results, seepage losses in the James Bypass between the Kings River and the San Joaquin River are estimated to be approximately 30 percent. These estimates do not account for additional river losses resulting from evaporation or in-stream phreatic uptake. The resulting reduction in seepage in the James Bypass ranges up to approximately 42,000AF in years when water is diverted to the proposed Project. For the smaller 1,200 cfs Project Alternative (Alternative 1), the resulting reduction in seepage in the James Bypass ranges up to approximately 33,000 AF in years when water is diverted.

The total average annual groundwater recharge of the underlying groundwater basin (Sub-Basin 15 in **Figure 3.10-3**) is estimated to be approximately 1.3 million acre-feet per year. The estimated reductions in seepage and associated reductions in groundwater recharge are summarized in **Table 3.10-5**. The estimated average annual reduction in seepage and recharge of the groundwater basin for the Proposed Project and Alternative 2 represents approximately 1.3 percent of the total recharge in the local groundwater sub-basin. The average annual reduction in seepage and recharge of the groundwater basin for Alternative 1 represents approximately 1.2 percent of the total recharge in the groundwater basin. This level of reduced groundwater recharge will be partially offset by the up to 12,000 AF of increased recharge between Army Weir and Empire Weir No. 2 in years when water is diverted to storage.

Figure 3.10-3: Groundwater Sub-Basins in Project Area

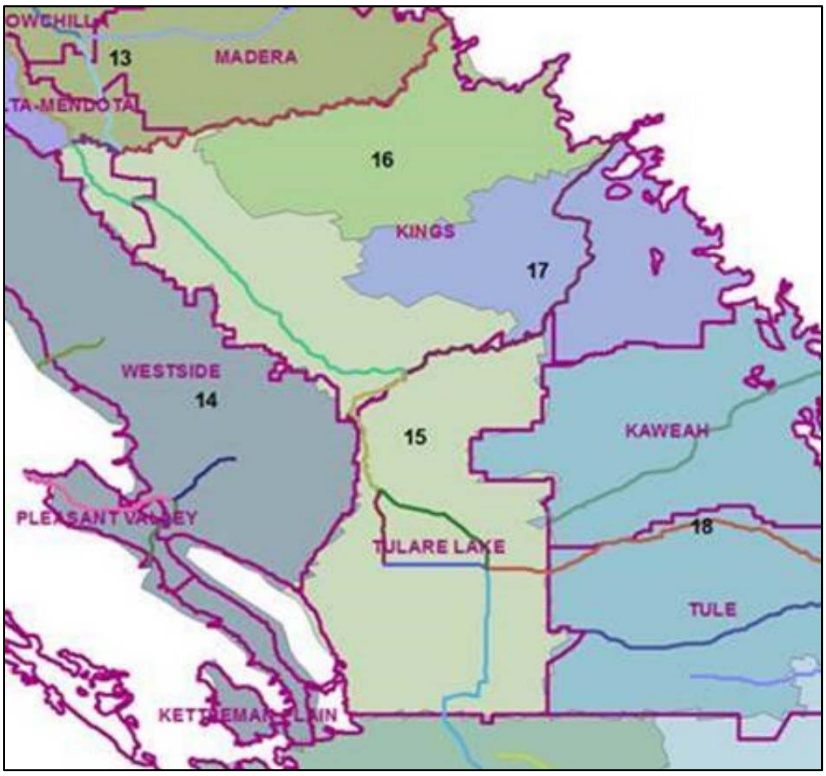


Table 3.10-5: Reductions in Groundwater Seepage/Recharge Resulting from Reduced Flows in the James Bypass – Proposed Project and Project Alternative 2

Year	Total Annual Sub-Basin Recharge (AFY)	30% Seepage Loss Proposed Project & Alternative 2 (AFY)		30% Seepage Loss Alternative 1 (AFY)	
1997	1,243,991	41,826	3.4%	33,450	2.7%
1998	1,481,149	6,145	0.4%	6,145	0.4%
1999	1,396,110	11	0.0%	11	0.0%
2000	1,455,762	12,058	0.8%	12,058	0.8%
2001	1,321,998	20,520	1.6%	20,520	1.6%
2002	1,347,064	9,790	0.7%	9,790	0.7%
2003	1,345,075	23,209	1.7%	23,209	1.7%
2004	1,338,036	0	0.0%	0	0.0%
2005	1,380,673	0	0.0%	0	0.0%
2006	1,525,220	62,890	4.1%	62,633	4.1%
2007	1,222,968	30,559	2.5%	30,559	2.5%
2008	1,213,517	10,353	0.9%	10,353	0.9%
2009	1,041,581	3,645	0.3%	3,645	0.3%
Averages	1,331,780	17,000	1.3%	16,336	1.2%

The Project is a storm water capture and recharge project that would provide expanded groundwater conjunctive use opportunities by capturing nuisance floodwater from the South Fork of the Kings River and other Tulare Lake tributaries, as well as surplus Delta flows, and either directly deliver this water and/or temporarily store captured water for later delivery to Semitropic's irrigation customers and the Semitropic Groundwater Bank. The Project is proposed in response to reduced deliveries from the SWP and declining groundwater levels, and would provide water supply benefits at regional and state levels. Given these potential benefits to the region, the Project's operation is not anticipated to deplete groundwater supplies or interfere with groundwater recharge resulting in a new deficit in aquifer storage or the lowering of local groundwater table levels.

The reduction in seepage to the groundwater basin is less a than significant impact during Project operations, and the potential to impact groundwater quality is also considered to be less than significant.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact HYD-3 Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site

Construction

All Facilities

Construction of Project facilities would require excavation, grading and recontouring of soils in the Project area. During these activities, erosion could occur if soils are exposed to high winds or heavy precipitation. However, a SWPPP will be prepared and submitted, which would include BMPs to minimize erosion hazards during grading and demolition activities, including erosion control and pollution prevention measures. With implementation of **Mitigation Measure HYD-1,** impacts will be less than significant.

Operation and Maintenance

Storage Facility

The proposed Project would construct and operate a storage facility to capture and store up to 30,000AF. The storage facility would serve to contain floodwater and thus, although the drainage pattern would be altered, the facility would be designed and managed so as not to cause substantial erosion or siltation on- or off-site. The storage facility would also continue to be used for agricultural purposes when not in use (seven out of ten years). With the continuation of grazing activities, the existing land cover would not be substantially altered from existing conditions and would not substantially affect erosion or siltation.

Conveyance Facilities

The proposed Project would construct facilities to capture available floodwaters from the South Fork of the Kings River and other tributaries, as well as surplus Delta flows, for ultimate delivery to the California Aqueduct through conveyance via the South Fork Canal, the proposed Kettleman Canal, the proposed Kettleman Reservoir, the proposed Aqueduct Intertie and/or the existing Blakeley Canal. The proposed conveyance routes (both existing and new canals) are earthen trapezoidal channels. The Project has been designed and would be operated in such a manner as to minimize erosion both to protect Project infrastructure and to preserve water quality and would therefore not result in substantial erosion or siltation on- or off-site. Additionally, although operation of the proposed Project would alter existing South Fork-Kings River flows by diverting floodwaters to the south instead of diverting them to the James Bypass,

these operations would use existing channel capacity and be conducted in a manner that would not result in substantial erosion or siltation on- or off-site.

Other Facilities

Operation of the other Project facilities is not expected to have any impact on existing drainage patterns.

Significance Determination before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure HYD-1: Storm Water Pollution Prevention Plan

Significance Determination after Mitigation

Less than significant.

Impact HYD-4 Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site, including as a result of a levee breach and/or expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam

Construction

All Facilities

During construction of Project facilities and improvements to existing diversion structures, cofferdams would be installed to reroute flows around the specific construction sites. Particularly, cofferdams may be used as part of construction of the Aqueduct tie-in, Empire Weir No. 2 improvements, and/or for construction of the weir connecting the South Fork Canal and the proposed Kettleman Canal. As construction at these locations would most likely occur during low-flow periods, the temporary diversion of flows around construction work areas would not substantially alter the area's overall drainage pattern.

Construction of the Project facilities, including the storage reservoir and canals, would not significantly increase the amount of surface runoff in such a manner that it would result in flooding on- or off-site. The rate and amount of surface runoff would essentially remain the same, such that there would be no increase in flooding, and the facilities would capture, rather than route runoff. Therefore, the potential for Project construction to substantially alter an existing drainage pattern at the Project area or result in increased flooding on- and/or off-site is less than significant. Construction of Project facilities would result in changes to topography in the Project area; however, given the relatively flat nature of the Project area, the presence of the facilities would not substantially alter area drainage patterns such that they would increase local flooding potential.

Operation and Maintenance

Storage Facility

Overall drainage patterns within the site and vicinity are not anticipated to be substantially altered by the proposed Project facilities. While Project operations would periodically increase flows in the South Fork of the Kings River (south of Army Weir) and in the South Fork Canal, it would not alter the course of the Kings River nor result in the potential for increased flooding. Project operations are designed to divert flood flows in the Kings River system, which will alleviate periodic flooding that is presently occurring in the Project area, providing a net benefit to the area.

Project operations would result in the storage of up to 30,000 AF of water behind levees that are up to eight feet tall, either through capture of floodwaters, storage of surplus Delta flows, or a combination of both. Although unlikely, a levee breach would have the potential to result in flooding in the immediate Project area. A breach analysis was conducted to model and evaluate the impacts of a potential floodplain inundation of the Tulare Lake bed from a levee breach (GEI Consultants, 2017b: See Appendix F). The analysis was performed assuming three breach locations along the eastern (downhill side) boundary of the proposed Kettleman Reservoir. Each breach location was assumed to have formed over a six-hour period for a 300-foot wide section of the levee, with a final bottom elevation equivalent to the nearest adjacent surrounding terrain. **Figure 3.10-4** shows the floodplain inundation of Tulare Lake bed at a full reservoir capacity of 30,000 AF.

The modeling results indicate that, during the breach, water from the reservoir would inundate a portion of the Tulare Lake bed east of the reservoir site due to the elevation and slope of the area. The existing Cross Levee, which runs north-south approximately two miles to the east of the proposed reservoir, would contain breach flows, and released water would begin to rise against this existing levee. Water leaving the reservoir would spread over approximately 8,700 acres of the Tulare Lake bed, reaching a maximum floodplain depth of approximately four feet. However, due to the existing topography at one location immediately next to the northernmost breach, the maximum flooding depth would be eight feet at that one location. If a breach were to occur, flooding would occur solely over agricultural lands, and regular inspection and preventative maintenance of the levees would minimize the potential for a breach to occur. Therefore, with regular maintenance and inspection, the potential for flooding during Project operations resulting from a levee breach is considered less than significant.

Another area of potential risk to the levees results from waves that could result from high winds. Such waves could result in erosion of the levees that form the Kettleman Reservoir. An analysis of the potential wave run-up on the reservoir levees was conducted by GEI (GEI Consultants, 2017e). The results of that analysis indicate the wave run-up for a 100-mph wind is estimated to be approximately 3-feet. The levees will be designed to accommodate at least a 3-foot freeboard with appropriate rock shielding in accordance with accepted levee design standards of the US Army Corps of Engineers and the California Department of Water Resources.

Conveyance and Other Facilities

Project conveyance facilities are designed to contain and convey flow. As such, operation and maintenance of these facilities would not result in localized flooding that could results in on- or off-site flooding. Similarly, other project facilities, such as the substation, would be constructed on pads that are graded and contained a crushed gravel surface. Precipitation falling on these facilities would infiltrate and/or drain in a manner similar to current conditions. Therefore, the potential for Project conveyance and other facilities to result in flooding either on- or off-site is less than significant.

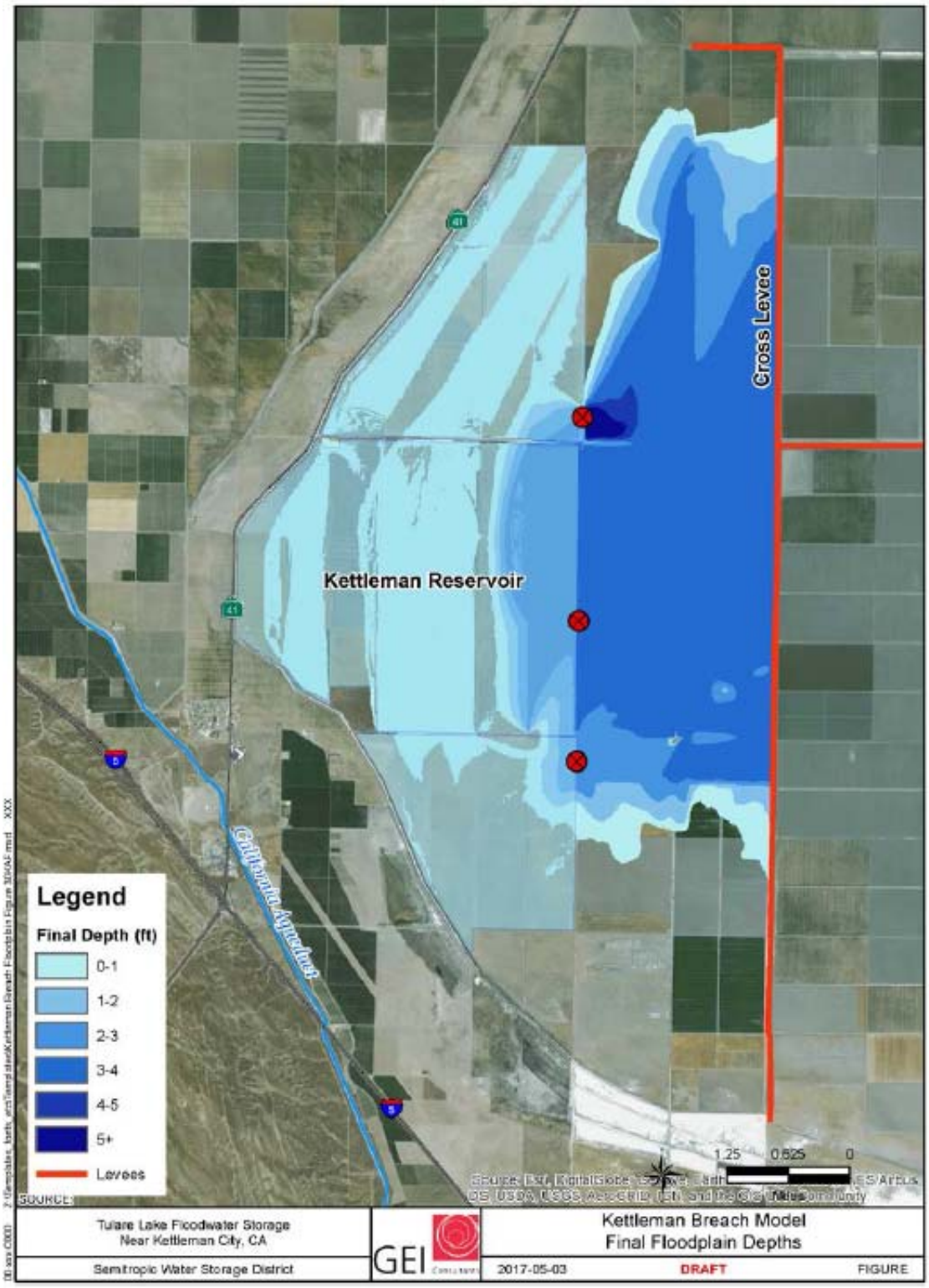
Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Figure 3.10-4: Floodplain Inundation due to Kettleman Reservoir Breaches (30,000 AF)



Impact HYD-5 Substantially alter the flows in a stream or river resulting in significant changes to flow patterns in downstream rivers and/or the Delta

Construction

All Facilities

As previously discussed, construction of Project facilities would not substantially alter the flows in a stream, river, or the California Aqueduct, and therefore would not significantly change flow patterns downstream.

Operations and Maintenance

All Facilities

Project operations would result in the redirection of either floodwaters from the Kings River and its tributaries, or redirection of Aqueduct water into storage when there are surplus Delta flows. In the former case, up to an additional 2,100 cfs of floodwaters from the Kings River would be diverted into the South Fork Canal with an additional 100 cfs of floodwaters diverted into the Blakeley Canal and away from the James Bypass and ultimately the San Joaquin River. Under current conditions, when flood events occur on the Kings River, floodwaters not lost to seepage and evaporation typically leave the watershed through the North Fork Kings River via Fresno Slough and James Bypass, ultimately ending up in the San Joaquin River (GEI, 2017c). As discussed in a report entitled *South Fork Kings River Hydrology Evaluation, Tulare Lake Storage and Floodwater Protection Project* (GEI, 2017c), flood flows from the Kings River to the James Bypass has occurred in 15 years over the 40-year study period extending from 1977 through 2016. Under proposed Project operations, floodwaters would be diverted to the South Fork of the Kings River through the existing Army and Crescent Bypass Weirs, instead of to the Fresno Slough and James Bypass, resulting in an increase in South Fork-Kings River flows of up to 2,200 cfs above current diversions at James Weir into this same river stretch. This would occur in, on average, three out of 10 years. At no time would diversions into the South Fork of the Kings River exceed the existing channel capacity of 3,200 cfs.

Table 3.10-6 through **Table 3.10-8** present the minimum, average, and maximum change in average monthly flows in the South Fork of the Kings River that would result from operation of the proposed Project and Alternative 2, the 2,100 cfs No Storage alternative, as described in *Chapter 5 Alternatives*. Alternative 2 would result in the diversion of up to 2,100 cfs at the Army and Crescent Bypass Weirs, resulting in similar impacts as those that would occur under the proposed Project. **Table 3.10-9** through **Table 3.10-11** present the same flow information for the Alternative 1 (the 1,200 cfs Project Alternative) project operations.

Table 3.10-6: Minimum Monthly Change in South Fork Kings River Flow Conditions Proposed 2,100 cfs Project Alternative (cfs)

Year	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
1997	26	1,090	0	0	0	0	0	0	0	0	0	0
1998	0	0	0	1,500	2,200	2,200	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0	0	0	0
2006	0	0	0	0	1,887	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0	0	0	0
2011	0	0	0	2,200	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0	0	0

Table 3.10-7: Average Monthly Change in South Fork Kings River Flow Conditions Proposed 2,100 cfs Project Alternative (cfs)

Year	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
1997	1,554	1,747	561	0	0	0	0	0	0	0	0	0
1998	5	61	932	2,156	2,200	2,200	1,395	4	0	0	9	117
1999	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	584	317	0	0	0	0	0	0
2006	0	0	0	1,808	2,117	1,993	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0	0	0	0
2011	167	0	395	2,200	1,007	1,202	792	0	0	0	0	0
2012	0	0	0	0	0	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0	0	0

Table 3.10-8: Maximum Monthly Change in South Fork Kings River Flow Conditions Proposed 2,100 cfs Project Alternative (cfs)

Year	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
1997	2,200	2,200	1,970	0	0	0	0	0	0	0	0	0
1998	149	391	2,020	2,200	2,200	2,200	2,200	88	0	0	261	356
1999	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	2,190	2,200	0	0	0	0	0	0
2006	0	0	0	2,200	2,200	2,200	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0	0	0	0
2011	651	0	2,146	2,200	2,200	2,200	2,200	0	0	0	0	0
2012	0	0	0	0	0	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0	0	0

Table 3.10-9: Minimum Monthly Change in South Fork Kings River Flow Conditions 1,200 cfs Project Alternative (cfs)

Year	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
1997	26	1,090	0	0	0	0	0	0	0	0	0	0
1998	0	0	0	1,300	1,300	1,300	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0	0	0	0
2006	0	0	0	0	1,300	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0	0	0	0
2011	0	0	0	1,300	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0	0	0

Table 3.10-10: Average Monthly Change in South Fork Kings River Flow Conditions 1,200 cfs Project Alternative (cfs)

Year	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
1997	1,059	1,233	474	0	0	0	0	0	0	0	0	0
1998	5	61	868	1,300	1,300	1,300	874	4	0	0	9	117
1999	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	461	233	0	0	0	0	0	0
2006	0	0	0	1,083	1,300	1,212	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0	0	0	0
2011	167	0	313	1,300	804	825	541	0	0	0	0	0
2012	0	0	0	0	0	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0	0	0

Table 3.10-11: Maximum Monthly Change in South Fork Kings River Flow Conditions 1,200 cfs Project Alternative (cfs)

Year	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
1997	1,300	1,300	1,300	0	0	0	0	0	0	0	0	0
1998	149	391	1,300	1,300	1,300	1,300	1,300	88	0	0	261	356
1999	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	1,300	1,300	0	0	0	0	0	0
2006	0	0	0	1,300	1,300	1,300	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0	0	0	0
2011	651	0	1,300	1,300	1,300	1,300	1,300	0	0	0	0	0
2012	0	0	0	0	0	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0	0	0

Project operations will result in a reduction in flood flows that have historically flowed from the Kings River, through the James Bypass, and into the San Joaquin River, resulting in a reduced level of flooding between the Kings River and the San Joaquin River, and potentially along the San Joaquin River downstream of the James Bypass discharge into the San Joaquin River.

The reduction in flood flows from the Kings River through the James Bypass to the San Joaquin River will result in a small reduction in flows in the San Joaquin River during peak flood events. As previously discussed, flood flows that flow through the James Bypass undergo seepage losses as they are conveyed through the James Bypass. Utilizing historic data and analyses of California Central Valley Groundwater-Surface Water Simulation Model (C2VSim) results, and since flows in the James Bypass are minimal during non-flood flow conditions, seepage losses in the James Bypass between the Kings River and the San Joaquin River are estimated to be approximately 30 percent. (These estimates may be considered conservative as additional losses would occur as a result of evaporation and phreatic uptake, but are not accounted for in these estimates.) The resulting reduction in flows in the San Joaquin River below the confluence with the James Bypass ranges up to 1,540 cfs for the proposed Project and Alternative 2. These flows represent between up to approximately a 6% reduction in the overall flow in the San Joaquin River at the Newman Gage when flood water is flowing in the James Bypass. For the smaller 1,200 cfs Project Alternative, the resulting reduction in flows in the San Joaquin below the confluence with the James Bypass ranges up to 910 cfs assuming the same 30% seepage loss.

Table 3.10-12 through **Table 3.10-14** present the minimum, average, and maximum reduction in floodwater flows through the James Bypass and into the San Joaquin River that would have occurred with the proposed Project and Alternative 2. **Table 3.10-15** through **Table 3.10-17** present the same information for the 1,200 cfs Project Alternative (Alternative 1).

Table 3.10-12: **Minimum Change in James Bypass Discharge to San Joaquin River Proposed Project and Alternative 2 (cfs)**

Year	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
1997	18	763	0	0	0	0	0	0	0	0	0	0
1998	0	0	0	1,050	1,540	1,540	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0	0	0	0
2006	0	0	0	0	1,321	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0	0	0	0
2011	0	0	0	1,540	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0	0	0

Table 3.10-13: Average Change in James Bypass Discharge to San Joaquin River Proposed Project and Alternative 2 (cfs)

Year	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
1997	1,088	1,223	393	0	0	0	0	0	0	0	0	0
1998	3	43	653	1,509	1,540	1,540	977	3	0	0	6	82
1999	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	409	222	0	0	0	0	0	0
2006	0	0	0	1,265	1,482	1,395	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0	0	0	0
2011	117	0	276	1,540	705	842	555	0	0	0	0	0
2012	0	0	0	0	0	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0	0	0

Table 3.10-14: Maximum Change in James Bypass Discharge to San Joaquin River Proposed Project and Alternative 2 (cfs)

Year	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
1997	1,540	1,540	1,379	0	0	0	0	0	0	0	0	0
1998	104	274	1,414	1,540	1,540	1,540	1,540	62	0	0	183	249
1999	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	1,533	1,540	0	0	0	0	0	0
2006	0	0	0	1,540	1,540	1,540	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0	0	0	0
2011	456	0	1,502	1,540	1,540	1,540	1,540	0	0	0	0	0
2012	0	0	0	0	0	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0	0	0

Table 3.10-15: Minimum Change in James Bypass Discharge to San Joaquin River Project Alternative 1 (cfs)

Year	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
1997	18	763	0	0	0	0	0	0	0	0	0	0
1998	0	0	0	910	910	910	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0	0	0	0
2006	0	0	0	0	910	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0	0	0	0
2011	0	0	0	910	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0	0	0

Table 3.10-16: Average Change in James Bypass Discharge to San Joaquin River Project Alternative 1 (cfs)

Year	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
1997	742	863	332	0	0	0	0	0	0	0	0	0
1998	3	43	608	910	910	910	612	3	0	0	6	82
1999	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	323	163	0	0	0	0	0	0
2006	0	0	0	758	910	849	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0	0	0	0
2011	117	0	219	910	563	578	379	0	0	0	0	0
2012	0	0	0	0	0	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0	0	0

Table 3.10-17: Maximum Change in James Bypass Discharge to San Joaquin River Project Alternative 1 (cfs)

Year	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
1997	910	910	910	0	0	0	0	0	0	0	0	0
1998	104	274	910	910	910	910	910	62	0	0	183	249
1999	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	910	910	0	0	0	0	0	0
2006	0	0	0	910	910	910	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0	0	0	0
2011	456	0	910	910	910	910	910	0	0	0	0	0
2012	0	0	0	0	0	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0	0	0

These reductions in flow through the James Bypass, and the resulting reductions in flow in the San Joaquin River, are occurring during periods of high/flood flow conditions, and are therefore considered to be a benefit by reducing potential flooding in the region.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact HYD-6 Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff or otherwise substantially degrade water quality

Construction

All Facilities

There are no existing or planned storm water drainage systems at the Project area. As detailed in Impact HYD-3 above, Project construction would include implementation of construction BMPs, and implementation of **Mitigation Measure HYD-1** would ensure that construction would not result in substantial erosion or siltation nor contribute additional sources of pollute runoff.

Operation and Maintenance

All Facilities

Because there are no existing or proposed storm water systems in the Project area project operations would not affect storm drainage systems. Additionally, Project operations involve the management of flood flows and surplus Delta flows, and as described in Impact HYD-3, Project facilities would be operated within the design parameters of those facilities to preserve their integrity and protect the quality of water being stored in and conveyed by those facilities.

Within the proposed reservoir boundaries there are two active oil wells that would be protected from inundation by perimeter levees, which would also serve as access roads to both the Project facilities and the existing active oil wells. During wet weather events, precipitation falling within the oil wells' perimeter levees would be directed to an internal sump location and the storm water collected within would be left to evaporate. If the capacity of the sump is reached, collected storm water would be pumped out to alleviate the potential for flooding. Prior to pumping, storm water in the sump would be tested for potential petroleum contamination. If found to be contaminated, the pumped storm water would be taken off site and disposed of at a permitted location. If found to meet Project water quality standards, the storm water would be pumped into an adjacent cell in the storage reservoir.

Significance Determination before Mitigation

Potentially significant.

Mitigation Measures

Implementation of **Mitigation Measure HYD-1**

Significance Determination after Mitigation

Less than significant.

Impact HYD-7 Place within a 100-year flood hazard area structures which would impede or redirect flood flows

As detailed in **Section 3.10.2**, FEMA implements the NFIP, which requires that new construction in a flood hazard area meet minimum design standards to place occupied structures above flood hazard areas. Flood hazard areas in Kings County are mapped in

Figure 3.10-2. According to the breach analysis conducted for the Project (GEI, 2017b), flood flows would naturally flow east, toward the lowest point of the Tulare Lake bed, east of the Project. The Project would not impede or redirect flood flows. In fact, as part of its main objectives, the Project would capture and manage floodwaters from the South Fork of the Kings River and possibly other tributaries to the Tulare Lake bed, as well as surplus Delta flows, thereby minimizing local flooding.

Portions of the Project area are within the 100-year flood hazard area as mapped by FEMA, and Project construction would place facilities within this area. However, Project construction would not place occupied structures within the 100-year flood hazard area, and would not result in the substantial alteration or redirection of flood flows as current flooding in the Project area occurs from river tributaries on the north and east (and the proposed Project is located on the northwestern extent of the Tulare Lake bed).

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Cumulative Impacts

The geographic scope of potential cumulative impacts relating to hydrology and water quality encompasses the Project area and immediate vicinity. There are six relevant projects within the immediate vicinity of the proposed Project that may contribute to cumulative impacts:

- Quay Valley Community Development - a new 7,175-acre community to be developed in south Kings County.
- Kettleman Hills Facility Expansion - expanding the existing B-18 Landfill and construct a new B-20 Landfill for hazardous waste and designated waste disposal.
- Kettleman City Surface Water Treatment Plant and Commercial Water Storage Tanks (Treatment Plant) – construction of a new surface water treatment plant to treat surface water for potable supply.
- Southwest Groundwater Banking Project – development of a project to divert and store floodwater from the Kings River and local storm water.
- JID Distributed Recharge Bypass and Lassen Projects – improvement to and construction of recharge facilities to divert and store floodwater from the Kings River.
- Terranova On-Farm Flood Capture and McMullin Recharge Site – improvements to and construction of facilities to divert floodwater from the Kings River for recharge on existing farm lands.

Potential cumulative impacts related to hydrology and water quality are generally site-specific and depend on local geologic and soil conditions. Other hydrologic-related impacts, such as increased flooding potential, resulting from construction and/or operation of these related projects are expected to be site-specific and related to specific project design. As such, there are no anticipated cumulative impacts associated with the proposed Project and the projects listed above assuming the implementation of construction best management practices at all sites.

Two of the projects listed above, the JID Distributed Recharge Bypass and Lassen Projects and Terranova On-Farm Flood Capture and McMullin Recharge Site Project, were included in a list of existing and proposed projects contained in a water rights application filed after the issuance of the NOP for this EIR. This application was filed jointly by Consolidated Irrigation District, Fresno Irrigation District, and Alta

Irrigation District, and is seeking rights to the diversion of 500,000 AFY of direct diversion of Kings River flows at rates of up to 4,500 cfs, and diversion of 1,000,000 AFY of water to storage. At present, there is no further information about this water right petition that has been identified, nor for the other 13 projects included in the petition.

The hydrologic analyses conducted for this impact analysis used historical data. It is a reasonable assumption that these data include historical diversions from the James Bypass by existing projects listed in the Consolidate/Fresno/Alta water rights application, and therefore only diversions from proposed projects in the Consolidate/Fresno/Alta water rights application are likely to contribute to cumulative impacts with the proposed Project. Further, the Consolidate/Fresno/Alta water rights application indicates that it is seeking water rights for all possible floodwaters off the Kings River. Assuming that the requested 4,500 cfs diversion contained in the Consolidate/Fresno/Alta water rights application represents these available flood flows, approval of the Consolidate/Fresno/Alta water rights application with the proposed Project water application could potentially result in a significant impact to downstream flows. However, approval of either water rights application, either in part or in whole, would be required from the State Water Resources Control Board (SWRCB) Division of Water Rights, and approval of these water rights applications, either in part or in whole, would be predicated on the prevention and/or minimization of significant downstream flow impacts. As such, assuming the SWRCB approves the proposed Project's water rights application (thereby facilitating the Project's operation), such approval would minimize the Project's contribution to cumulative impacts such that it would not be considered cumulatively considerable.

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3.11 Land Use and Planning

This section presents the existing physical and regulatory setting for land use and planning in the vicinity of the Project. The impact analysis considers the potential for the Project to physically divide the community or conflict with adopted land use plans or policies, and provides mitigation measures that would reduce significant impacts.

3.11.1 Environmental Setting

This section describes the environmental setting for land use and planning within the Project area.

Regional Land Use

Kings County encompasses 1,392 square miles of land and has a total population of approximately 150,982 (Kings County, 2015f; USCB, 2015b). Over 92% of the land in Kings County is classified as Agriculture Open Space in the Kings County General Plan as it is one of the most productive agricultural regions in the United States (Kings County, 2010f). There are few urban areas in Kings County, most of which are located in the northern portion of the County and include the four incorporated cities of Avenal, Corcoran, Hanford, and Lemoore. In addition, there are seven census-designated places, including Armona, Grangeville, Hardwick, Home Garden, Kettleman City, Lemoore Station, and Stratford. The proposed Project is located east of Interstate 5 and State Highway 41, near Kettleman City and north of the Kings-Kern County line. The Project area lies outside of the jurisdiction of any nearby cities.

The Project lies within the Tulare Lake Bed, a former freshwater lake with residual wetlands and marshes. Prior to the late 19th century, nearly all of Kings County was covered by the Tulare Lake Bed and it was considered the largest freshwater lake west of the Great Lakes (Preston, 1981). Historically, the Kings, Kaweah, and Tule Rivers flowed into the Tulare Lake bed and the Kern River flowed into the Kern, Buena Vista, and Goose Lake beds or into adjacent wetlands and marshes (DWR, 2009). In the late 19th century, the lake and surrounding marshes were drained by settlers in an effort reclaim "unproductive" land to develop grazing and harvesting areas. In addition, the upstream Kaweah, Kern, Kings, and Tule Rivers were dammed in order to turn their headwaters into reservoirs in the Sierra Nevada Mountains and diverted to support agricultural productivity.

Today, the Tulare Lake Bed covers approximately 17,000 square miles in the southern end of the San Joaquin Valley (DWR, 2009). It is an area bounded by the Sierra Nevada to the east, the Tehachapi Mountains to the south, the Coast Ranges to the west, and by a broad ridge between the San Joaquin and Kings Rivers on the north. Tulare Lake is the low elevation point in the Tulare Lake Basin and the receiving area for the drainages from the Kings, Kaweah, Tule, and Kern Rivers.

The proposed Project is located to the north of Semitropic and upstream on the California Aqueduct from Semitropic's existing aqueduct turnouts. The Project would include the construction of a surface storage reservoir along the western perimeter of the historic Tulare Lake, on a 16,700-gross acre portion of the dry lakebed. The Project would provide an intertie between the new storage facilities and the California Aqueduct and would include construction of a new conveyance canal connecting the existing South Fork Canal to the Aqueduct Intertie. Associated pumping plants would also be installed on applicable pipelines and canal segments, in addition to the construction ancillary facilities such as an electrical switchyard and substation and maintenance yard.

3.11.2 Regulatory Framework

Federal Policies and Regulations

This section describes laws and regulations at the federal, state, and local level that may apply to the Proposed Action.

Federal Aviation Regulations

The Federal Aviation Regulations (Section 77.13 ff, Part 77) require notice of any construction or alteration that is (a) more than 200 feet in height above ground level, or (b) greater than identified heights at specified radii and slopes from the nearest runway of certain airports. The proposed Project facilities would not exceed 200 feet in height nor the most restrictive radius and slope requirement. No other applicable federal land use plans or policies have been identified as applicable to the proposed Project.

PG&E San Joaquin Valley Operations and Maintenance Habitat Conservation Plan

Section 10 of the federal Endangered Species Act allows for issuance of incidental take permits for endangered species to private parties provided a HCP is developed and approved. Typically, a private party initiates consultation with the USFWS or NOAA Fisheries to discuss target species in a project area, and then the private party prepares an HCP, which must be approved by USFWS or NOAA Fisheries. The HCP assesses the potential for the project to adversely affect federally listed species and presents the measures that will be undertaken to avoid and minimize such impacts.

PG&E has a HCP for its operations and maintenance activities in the San Joaquin Valley, the *PG&E San Joaquin Valley Operations & Maintenance Habitat Conservation Plan* (Jones and Stokes, 2006). This HCP covers 23 wildlife and 42 plant species for 33 routine operations and maintenance activities for PG&E's electric and gas transmission and distribution systems within nine counties of the San Joaquin Valley, including Kings County. The proposed Project is within the boundaries of this HCP.

State Policies and Regulations

The Project is within the jurisdiction of the Central Valley Regional Water Quality Control Board, which governs many of the regulations associated with water supply, wastewater, and storm drainage. The Regional Boards administer regulations related to discharges under the Federal Water Pollution Control Act of 1972 as amended (the CWA) and the Porter-Cologne Water Quality Control Act. Additional discussion of these regulations is provided in *Chapter 3.10, Hydrology and Water Quality*.

The Kings County Association of Governments (KCAG) is a joint powers authority with regional responsibility for addressing interjurisdictional and regional public policy matters. KCAG's member agencies include the cities of Avenal, Corcoran, Hanford, Lemoore, and the County of Kings. KCAG is also a state-designated regional transportation planning agency (RTPA) recognized by the State's Business, Transportation, and Housing Agency. The RTPA is responsible for administering the RTP, preparing a Regional Transportation Improvement Program (RTIP), the Federal Transportation Improvement Program (FTIP), reviewing the State Transportation Improvement Program (STIP) and other state transportation programs, monitoring local public transit operations, overseeing federal transportation grant proposals, and administering the Local Transportation Fund (LTF) and State Transit Assistance (STA) funds. KCAG is also responsible for preparing the Regional Housing Needs Allocation Plan (RHNA) and developing the Kings County portion of the San Joaquin Valley Blueprint. The RHNA is directly tied to the Housing Element, which is being updated separately as it has its own prescribed state timeline for adoption.

SB 115 and SB 89

CalEPA is charged with implementing SB 115 (Solis) and SB 89 (Escutia) to ensure "the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and

enforcement of environmental laws and policies." SB 115 gives CalEPA broad responsibilities to include environmental justice in the design and implementation of programs, policies, and activities. SB 115 also established the Governor's Office of Planning and Research as the lead agency for implementation of environmental justice programs within the State. CalEPA developed the 2004 Inter-Agency Environmental Justice Strategy to serve as the overarching environmental justice vision document for the program.

See *Section 3.3 Agricultural Resources* for policies and regulations applicable to the agricultural land use in the area.

AB 162

California AB 162 strengthens flood protections in California by requiring jurisdictions, upon the next revisions of the mandatory Housing Element on or after January 1, 2009, to update flood related information in its General Plan. The bill requires the land use element of a General Plan to identify and annually review those areas covered by the plan that are subject to flooding as identified by flood plain mapping prepared by the Federal Emergency Management Agency or the Department of Water Resources. In addition, AB 162 requires the conservation element of the General Plan to identify rivers, creeks, streams, flood corridors, riparian habitat, and land that may accommodate floodwater for purposes of groundwater recharge and stormwater management.

Local Policies and Regulations

Local Agency Formation Commission (LAFCo) of Kings County Policies and Procedures Manual.

The State of California has the exclusive power to regulate boundary changes, which means that no local government has the right to change its own boundary without State approval. The Legislature has prescribed a "uniform process" for boundary changes for both cities and special districts that is now embodied in the Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000 (California Government Code Section 56000 *et seq*.). This Act delegates the Legislature's boundary powers to Local Agency Formation Commissions or LAFCos. LAFCo of Kings County is responsible for reviewing and approving proposed jurisdictional boundary changes in Kings County, including the annexation and detachment of territory to and/or from cities and most special districts, incorporations of new cities, formations of new special districts, and consolidations, mergers, and dissolutions of existing districts. In addition, LAFCos must review and approve contractual service agreements, conduct service reviews, and determine spheres of influence boundaries for each city and district.

The LAFCo of Kings County Policies and Procedures Manual (revised April 22, 2009) outlines LAFCo's objectives, policies for reviewing proposals and standards of review. In general, LAFCos base decisions on the following objectives: to encourage the orderly formation of local government agencies, to preserve agricultural lands, and to discourage urban sprawl. These policies are described as follows.

- *Preserve Agricultural Land Resources.* LAFCo must consider the effects that any proposal will produce on existing agricultural lands. By guiding development toward vacant urban land and away from agricultural preserves, LAFCo assists with the preservation of our valuable agricultural resources. Section 56377 guides this objective by requiring that LAFCo must consider the following when reviewing and approving or disapproving proposals which could reasonably be expected to induce, facilitate, or lead to the conversion of existing open-space lands to other than open-space uses. The commission shall consider all of the following policies and priorities:

    a. *Development or use of land for other than open-space uses* shall be guided away from existing prime agricultural lands in open-space use toward areas containing nonprime

agricultural lands, unless that action would not promote the planned, orderly, efficient development of an area.

b. *Development of existing vacant or nonprime agricultural lands for urban uses* within the existing jurisdiction of a local agency or within the sphere of influence of a local agency should be encouraged before any proposal is approved which would allow for or lead to the development of existing open-space lands for non-open-space uses which are outside of the existing jurisdiction of the local agency or outside of the existing sphere of influence of the local agency.

- *Discourage Urban Sprawl.* Urban sprawl can best be described as irregular and disorganized growth occurring without apparent design or plan. This pattern of development is characterized by the inefficient delivery of urban services (police, fire, water, and sanitation) and the unnecessary loss of agricultural land. By discouraging sprawl, LAFCo limits the misuse of land resources and promotes a more efficient system of local governmental agencies.

Regional Transportation Plan

Kings County Association of Governments Final 2007 RTP, adopted May 23, 2007, is designed to comply with the RTP Guidelines adopted by the California Transportation Commission (CTC) in December 1999 (KCAG, 2007). The RTP is intended to serve many purposes, including to:

- Provide the foundation for transportation decisions by local, regional, and state officials.
- Document the region's mobility needs and issues.
- Identify and attempt to resolve regional issues and provide policy direction for local plans.
- Document the region's goals, policies, and objectives for meeting current and future transportation mobility needs.
- Set forth an action plan to address transportation issues and needs consistent with Regional and state policies.
- Identify transportation improvements in sufficient detail to aid in the development of the STIP and to be useful in making decisions related to the development and growth of the region.
- Identify those agencies responsible for implementing the action plans.
- Document the region's financial resources needed to meet mobility needs.

San Joaquin Valley Blueprint

The eight San Joaquin Valley counties of San Joaquin, Stanislaus, Merced, Madera, Fresno, Tulare, Kings, and Kern make up the regional planning area under the San Joaquin Valley Blueprint. The San Joaquin Valley Blueprint (SJVB) process develops a cohesive regional framework that defines and offers alternative solutions to growth-related issues for the Valley. The process involves the integration of transportation, housing, land use, economic development, and the environment to produce a preferred growth scenario to the year 2050. Each county within the SJVB was responsible for developing individual local blueprints to be integrated into the larger eight-county blueprint. Under the coordination efforts of KCAG, a Kings County Blueprint Vision for urban growth has been defined that emphasizes city-centered urban growth, economic development, and agricultural preservation. This local blueprint effort resulted in defining a Blueprint Urban Growth Boundary for each of the four cities and four unincorporated community districts in Kings County to emphasize city centered urban growth, economic development, and agricultural preservation. The local Blueprint also calls for increasing residential density to at least 24 percent above status quo development trends. As with the passage of Senate Bill 375 (Chapter 728, Statutes of 2008), the

Kings County Association of Governments will work towards defining "Sustainable Community Strategies." New developments must integrate many of the common themes associated with smart growth, compact development, increased walkability, centralized accessible commercial areas, and assist in defining potential avenues of implementation in this rural agricultural-based County environment. Kings County Blueprint Integration Tools apply only to the cities of Avenal, Corcoran, and Lemoore.

Kings County Zoning Ordinance

The Kings County Zoning Ordinance specifies the zoning districts that correspond with the land use designations of the General Plan. The Zoning Ordinance sets the development standards, such as allowable uses, activities, setbacks, and height requirements, for each zoning district in the unincorporated areas and is designed to promote and protect the public health, safety, peace, morals, comfort, convenience, and general welfare of those living and working in Kings County. The Project area is zoned as General Agriculture 20-Acre Minimum, General Agriculture 40-Acre Minimum, and Exclusive Agriculture; that is, the Project area is designed to support and enhance agriculture as the predominant land use (Kings County, 2010f). Uses and policies regarding the General Agriculture zone are intended to protect open space lands, and ensure that all land uses are compatible with agriculture and open space, including natural resources management. County Agricultural Zoning Districts Land Use Regulations include the following permitted uses:

- Public utility and public service structures including reservoirs
- Accessory structures located on the same site with a permitted use
- Irrigation, flood control and drainage facilities, percolation basins, groundwater recharge wells and evaporation ponds

Kings County General Plan

The Kings County General Plan guides development for the County within a 20-year planning horizon. The Land Use Element of the County's General Plan designates the Project area within unincorporated territory and as Agriculture Open Space (Kings County, 2010f). The Agriculture Open Space classification includes the designations of Limited Agriculture, General Agriculture 20-Acre, General Agriculture 40-Acre, and Exclusive Agriculture. This classification is intended to "define distinct areas of agricultural intensity, and protect agricultural land from the encroachment of incompatible uses."

Land Use Element

The Kings County General Plan, Land Use Element (Kings County, 2010f) includes the following goals addressing spaces classified as Agriculture Open Space and Community District land uses. Goals addressing Agricultural Open Space lands are specified in *Chapter*

3.3 Agricultural Resources.

- *LU Policy B2.1.1:* The primary use of land designated as Limited Agriculture, General Agriculture, and Exclusive Agriculture shall remain devoted to agricultural uses and related supported services.
- *LU Goal B4:* Housing is intended for those engaged in farming.
- *LU Goal B5:* Prevent discontinuous patterns of non-agricultural growth. Ensure coordinated approaches to urban and agricultural land use planning to prevent discontinuous development patterns that increase development pressure on other agricultural lands that may lead to premature conversion, disorderly urban growth, insufficient provision of municipal services, and urban sprawl.
- *LU Goal B7:* Community benefiting non-agricultural uses remain compatible within the County's Agriculture Open Space area, and are supported for their continued operation and existence.

- *LU Objective B7.1:* Allow compatible open space and public uses of land within the Agriculture Open Space area of the County.

Open Space Element

The Kings County Open Space Element (Kings County, 2010h) identifies the County's "open space land" and establishes guiding goals for the preservation and conservation of land within the County that is essentially unimproved and devoted to open space use (e.g. natural resources, outdoor recreation, public health and safety). The Open Space Element includes the following goals relative to land use and planning:

- *OS Goal B1:* Maintain and protect the scenic beauty of Kings County.
- *OS Goal C1:* Preserve the visual identities of Community Districts by maintaining open space separations between urban areas.
- *OS Goal E1:* Maintain open space areas near Naval Air Station Lemoore and underlying low level military airspace corridors and ranges.
- *OS Goal F1:* Ensure that Community Districts integrate adequate open space as part of their community plans.

3.11.3 Impact Analysis

Methodology for Analysis

Potential impacts on surrounding land use and facilities are analyzed based on the potential for the Project to affect the land uses and facilities described above in *Section 3.11.1, Environmental Setting* during construction or operation. The analysis also includes an evaluation of the Project's consistency with local and regional land use policies. Existing site conditions prior to construction of the proposed Project are compared to site conditions both during construction activities and after the Project facilities are operational.

Thresholds of Significance

For the purposes of this analysis, an impact to land use would be significant if the Project would:

- Physically divide an established community.
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect.
- Conflict with any applicable Habitat Conservation Plan or Natural Community Conservation Plan.

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to actions associated with the Project are identified below along with a supporting rationale as to why further consideration is unnecessary and a no impact determination is appropriate.

- *Physically divide an established community:* Development of the Project facilities would not physically divide the surrounding agriculture-related land uses. Construction of Project facilities would increase the density of activities in the Project area, but would not physically divide an established community. Therefore, there would be no impact on the established community.

Impacts and Mitigation Measures

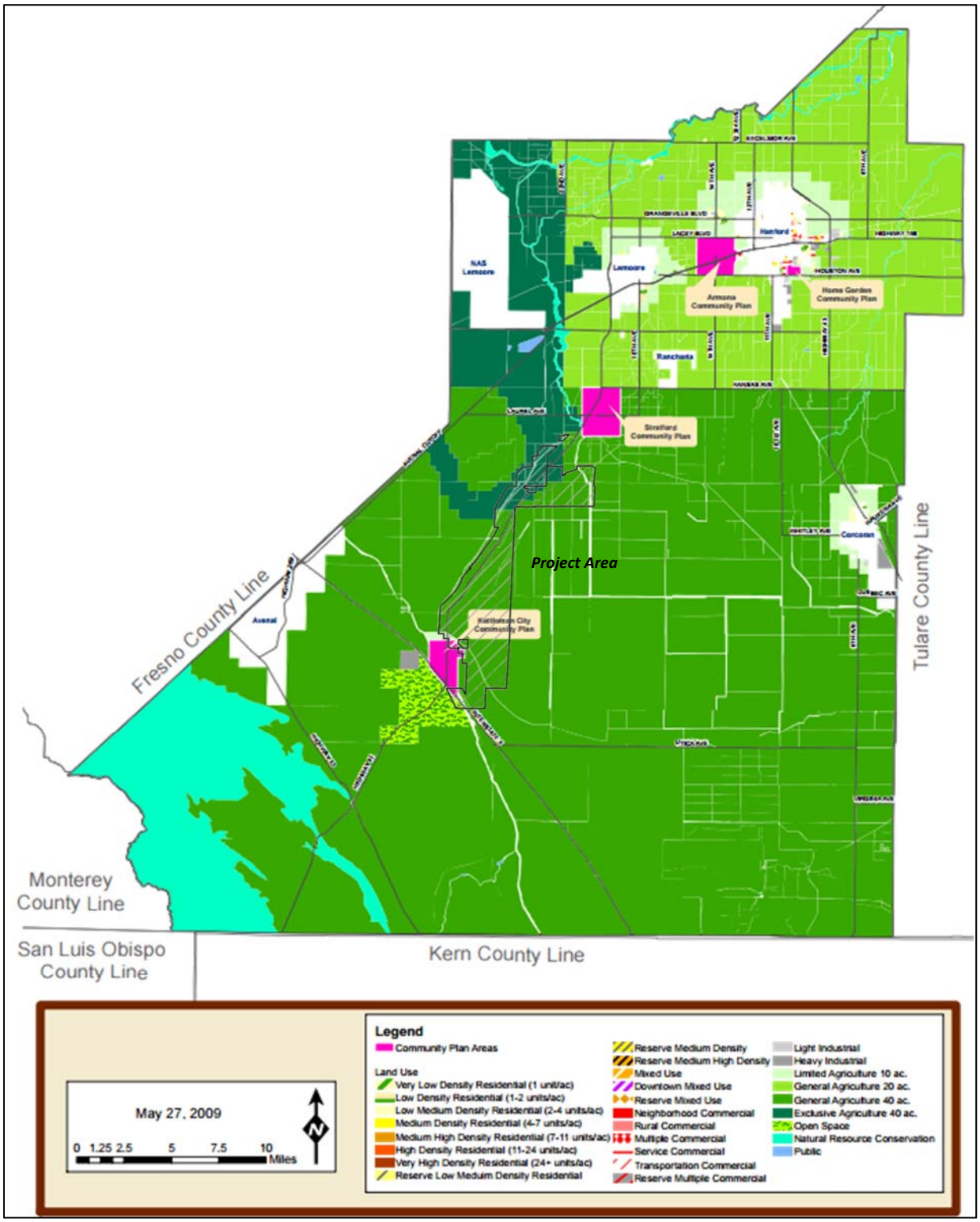
Impact LUR-1 Conflict with Any Applicable Land Use Plan, Policy, or Regulation

Construction

Storage Facilities

The surface storage facility (Kettleman Reservoir) would be constructed on land that is currently zoned as General Agriculture 40-Acre land, as shown in Error! Reference source not found. . The majority of the land is currently fallowed, but other uses include grazing and agricultural production. Construction of the Kettleman Reservoir would temporarily disrupt agricultural use of this land during the construction period. However, the reservoir site and affected areas surrounding the storage reservoir would be returned to their original use once construction is completed and when the Project is not in operation. Given that construction would be temporary, construction of the Kettleman Reservoir would not result in a permanent change in land use, and therefore would not conflict with any land use plan, policy, or regulation. Furthermore, construction of the reservoir would not conflict with the overarching priorities stated in the Kings County General Plan, which are to "protect prime agricultural land," "direct urban growth to existing cities and community districts," and "increase economic and community sustainability" (Kings County, 2010f). The Project's impacts are therefore considered less than significant.

Figure 3.11-1 Land Use Classifications in Kings County



Source: Kings County General Plan, Land Use Element, 2010.

Conveyance Facilities

Some of the conveyance facilities used to transport water to the California Aqueduct already exist and would be improved to accommodate anticipated Project flows. Since this infrastructure already exists and the Project plans to use these existing structures (namely the South Fork Canal, Blakeley Canal and Empire Weir No. 2), there would be no land use change. Existing facilities are already in compliance with land use plans, policies, and regulations, and improvements to these facilities would not lead to a change in land classification.

New conveyance facilities would be required to convey floodwaters to the storage reservoir and the California Aqueduct; these new facilities would include the Kettleman Canal and Aqueduct Intertie (and associated facilities). Land in proposed locations for these new facilities is categorized as AG-40, as shown in Error! Reference source not found. (Kings County, 2010f). Most land in the Project area in the AG-40 category is currently fallowed, used for grazing, or used for agricultural activities. Construction of Aqueduct Intertie facilities would require the clearing of approximately 19 acres of agricultural land containing almond trees. While removal of the almond trees and conversion to Aqueduct Intertie facilities would conflict with Kings County General Plan, *LU Policy B2.1.1*, which states that "the primary use of land designated Limited Agriculture, General Agriculture, and Exclusive Agriculture shall remain devoted to agricultural uses and related supported services" (Kings County, 2010f), there are over 1,700 acres of almonds trees in the immediate vicinity of the connecting pipeline, and the loss of 19 acres (approximately 1% loss of trees) would be not be a substantial impact on agricultural production.

Overall, impacts relating to the construction of new conveyance facilities would be temporary, only affecting land use during the construction period. Further, construction of the conveyance facilities would not conflict with the intentions of General Agriculture zones which are to intended to "protect open space lands, and ensure that all land uses are compatible with agricultural and open space, including natural resources management" (Kings County, 2010f). The Project's impacts are therefore considered less than significant.

Other Facilities

Additional facilities to be constructed as part of the Project include a new electrical switchyard and substation, maintenance yard, and pumping plants. Construction of these other facilities may disrupt agricultural production in the area, as these facilities would be constructed in areas zoned as AG-40, as shown in Error! Reference source not found. (though most of this land is fallowed). Construction would temporarily disrupt agricultural production in the area; however, all disturbed areas would be re-vegetated in order to return the land to grazing, or would be left fallowed. Conversion of AG-40 land to be used for a maintenance yard and pumping plants would not conflict with the purpose of AG-40 land and the *LU Policy B2.1.1,* which emphasizes that land dedicated as General Agriculture should remain devoted to agricultural uses and related supported services (Kings County, 2010f). These facilities would be considered "supported services" and would not lead to the conversion of land categorized as General Agriculture to non-agricultural use. Therefore, the Project would have no significant impacts.

Operations & Maintenance

Storage Facilities

The Kings County Agricultural Zoning Districts Land Use Regulations permit the construction and operations of reservoirs on AG-40 designated lands (Kings County, 2017). Additionally, according to the Kings County Land Use Element, land designated as AG-40 is designed to "allow intensive agricultural uses that by their nature may be incompatible with urban uses" (Kings County, 2010f). In addition, most of the land designated as AG-40 is also "subject to flood hazard risk and should remain devoted to agriculture use to reduce the potential for future conflicts" (Kings County, 2010f). The operation of the Kettleman Reservoir would improve the management of floodwaters and reduce the risk of flooding by storing excess

floodwaters from the South Fork of the Kings River in a controlled and safe manner. Operation of the Kettleman Reservoir would occur on land zoned as AG-40, which aligns with the intent of this land designation and would actively reduce the hazards associated with periodic flooding. It is estimated that excess floodwaters would be captured in the Kettleman Reservoir three out of every ten years. During the interim years when storage in the reservoir is not needed, the land would be available for grazing and cultivation. Returning the land to its original use for an estimated seven out of ten years indicates that land use would remain as-is most the time when floodwaters are not being captured. The return of land to its original use is consistent with existing land use plans and designations and would not lead to conflict.

Furthermore, operation of the Kettleman Reservoir aligns with the AB 162 Flood Protection Laws (Chapter 369 of the Statutes of 2008) to address flood protection issues throughout the County's unincorporated areas as the Project would capture and store floodwaters until moved south to Semitropic and other places of use. The Project would provide local, regional, and statewide public benefits to meet California's water storage and supply challenges, capturing and storing floodwaters from the Kings River. Impacts are therefore considered less than significant.

Conveyance Facilities

Operation of the improved Empire Weir No. 2 and the South Fork Canal would not conflict with any land use plans as these facilities existed prior to the proposed Project. Since the Project plans to use existing conveyance structures in the area, there would be no re-categorization of the current land use as it would not differ from previous land uses.

In addition, the new conveyance facilities, including the Kettleman Pumping Plants #1 and #2, Kettleman Canal, and Aqueduct Intertie would not conflict with existing land use plans. Since this area already contains levees and irrigation structures, the addition of new conveyance facilities would not lead to the re-zoning of these lands. New operating facilities would be compatible with existing land uses and designations. These new conveyance structures would not require any re-zoning or spur urban growth; therefore, not conflicting with any applicable land use plan, policy or regulation. Once in operation, the conveyance facilities would continue to meet the requirements set in the Kings County General Plan and in the Kings County Agricultural Zoning Districts Land Use Regulations, where agricultural lands are designed to "protect land from premature conversion, prevent encroachment of incompatible uses, and establish intensity of agricultural uses in a manner that remains compatible with other uses with the County" (Kings County, 2010f) and where irrigation and flood control facilities are permitted uses (Kings County, 2017). Impacts are therefore considered less than significant.

Other Facilities

Operation of the Project's other facilities, including the maintenance yard, pumping plants, and electrical switchyard and substation would not result in a shift in a land use designation of AG-40 to a non-agricultural designation because these facilities would be considered "support services" to AG-40 land under the *LU Policy B2.1.1* (Kings County, 2010f) and are considered accessory structures located on the same site with a permitted use (consistent with the County's Agricultural Zoning Districts Land Use Regulations, 2017). These facilities would be considered "supported services" and would not lead to the conversion of land categorized as General Agriculture to non-agricultural use, which would conflict with the County's Land Use Policies. Therefore, there are no significant impacts.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact LUR-2 Conflict with Any Applicable Habitat Conservation Plan or Natural Community Conservation Plan

Construction

All Facilities

Construction of the proposed Project's facilities would occur within an area encompassed by PG&E's *San Joaquin Valley Operations & Maintenance Habitat Conservation Plan* (Jones & Stokes, 2006), as shown in **Figure 3.11-2**. This HCP is the only plan in the Project vicinity and compliance with this HCP is addressed in *Section 3.5 Biology*. Construction of proposed Project facilities may impact local habitats, however, these impacts would be temporary in nature, and the construction sites would be restored once construction has been completed. As such, construction-related impacts are considered temporary and therefore any impact would be considered less than significant.

Operations & Maintenance

All Facilities

As discussed in *Chapter 3.5 Biology* and shown above in Figure 3.11-2, the proposed Project lies within the boundary of PG&E's *San Joaquin Valley Operations & Maintenance Habitat Conservation Plan*. Although the Project is located within the jurisdiction of PG&E's HCP, the Project would allow for the continued use of agricultural activities at the site, and when in operation, would support the development of over 10,000 acres of intermittent aquatic and riparian habitat and support habitat for migratory birds along the Pacific flyway. Native wildlife would also benefit from the operation of the storage reservoir by returning intermittent wetlands and shallow water habitats to the region. These benefits align with the goals of PG&E's HCP, which seeks to protect sensitive species and habitats even as infrastructure maintenance occurs and evolves. As such, Project operations and maintenance would result in less than significant impacts.

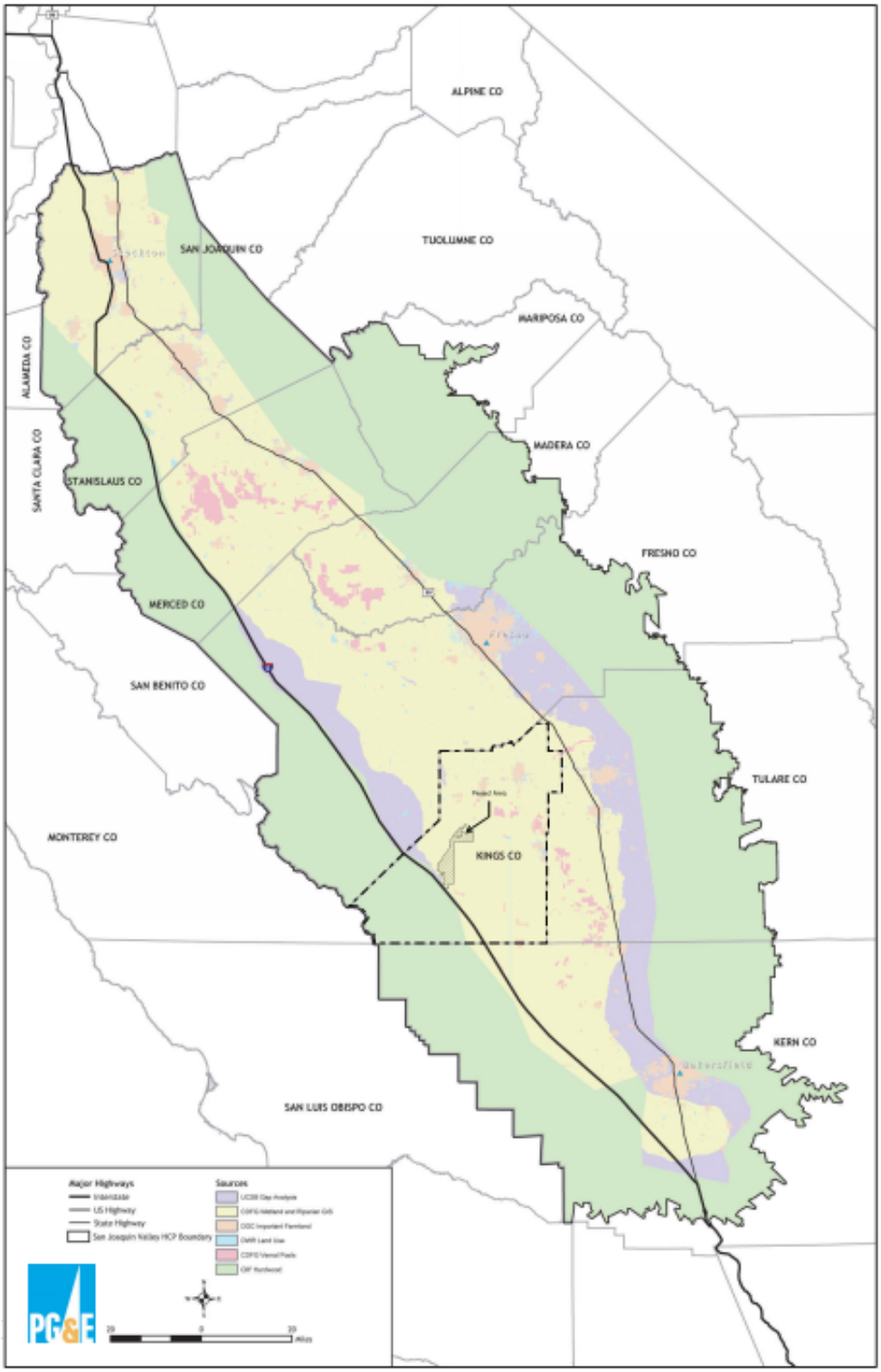
Significance Determination before Mitigation

Less than significant

Mitigation Measures

No mitigation measures are required.

Figure 3.11-2 San Joaquin Valley Operation and Maintenance HCP near Project Area



Source: Jones & Stokes, 2006.

Cumulative Impacts

The geographic scope of cumulative impacts on local and regional land use must be considered cumulatively in context of existing County and State planning documents. Several relevant present and future projects are under construction or in the planning phase that are in proximity to the Proposed Project include the following:

- Quay Valley Community Development - a new 7,175-acre community to be developed in south Kings County.
- Kettleman Hills Facility Expansion - expanding the existing B-18 Landfill and construct a new B-20 Landfill for hazardous waste and designated waste disposal.
- Kettleman City Surface Water Treatment Plant and Commercial Water Storage Tanks (Treatment Plant) – construction of a new surface water treatment plant to treat surface water for potable supply.
- Southwest Groundwater Banking Project – development of a project to divert and store floodwater from the Kings River and local stormwater.
- JID Distributed Recharge Bypass and Lassen Projects – improvement to and construction of recharge facilities to divert and store floodwater from the Kings River.
- Terranova On-Farm Flood Capture and McMullin Recharge Site – improvements to and construction of facilities to divert floodwater from the Kings River for recharge on existing farm lands.

Implementation of the proposed Project, in conjunction with the projects listed above, would not create cumulative land use conflicts and the Project would, in fact, help preserve the agricultural nature of the existing land. As such, the facilities and infrastructure associated with the proposed Project would be constructed in unincorporated areas of Kings County, would preserve and is consistent with the agricultural use of the Project area, and would not create long-term cumulative impacts associated with dividing an established community or conflicting with a local HCP.

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3.12 Noise

This section evaluates the potential noise impacts associated with constructing and operating the Project. It describes the existing ambient noise environment, presents relevant noise regulations and standards, identifies sensitive noise receptors that could be affected by the Project, and evaluates the potential effects of project construction and O&M on these receptors.

3.12.1 Environmental Setting

The following sections describe the environmental setting for noise within the study area, which includes the Project area and adjacent areas, from which construction and O&M noise would be audible. The land use of the Project area is mainly dry grazing and agriculture, but is mostly fallowed at present. In general, the area is rural with few sensitive receptors.

Noise Descriptors

Sound and Noise Background

Sound is characterized by various parameters that describe the rate of oscillation of sound waves, the distance between successive troughs or crests, the speed of propagation, and the pressure level or energy content of a given sound. The sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound. The decibel (dB) scale is used to quantify sound pressure levels.

Because sound can vary in amplitude by over one million times within the range of human hearing, a logarithmic loudness scale is used to keep sound pressure numbers at a manageable level. Since the human ear is not equally sensitive to all sound frequencies within the entire spectrum, human response is factored into sound descriptions in a process called "A-weighting," expressed as "dBA." The dBA, or A-weighted decibel, refers to a scale of noise measurement that approximates the range of sensitivity of the human ear to sounds of different frequencies. On this scale, the normal range of human hearing extends from about 0 dBA to about 140 dBA. Some representative noise sources and their corresponding A-weighted noise levels are shown in **Table 3.12-1**. All the noise levels reported herein are A-weighted unless otherwise stated.

Noise is defined as unwanted sound. Sound, traveling in the form of waves from a source, exerts a sound pressure level (referred to as sound level), which is measured in decibels, with zero dBA corresponding roughly to the threshold of human hearing and 120 to 140 dBA corresponding to the threshold of pain. Pressure waves traveling through air exert a force registered by the human ear as sound.

Table 3.12-1: Typical A-Weighted Sound Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	— 110 —	Rock band
Jet fly-over at 1000 feet		
	— 100 —	
Gas lawn mower at 3 feet		
	— 90 —	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	— 80 —	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	— 70 —	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	— 60 —	
		Large business office
Quiet urban daytime	— 50 —	Dishwasher next room
Quiet urban nighttime	— 40 —	Theater, large conference room (background)
Quite suburban nighttime		
	— 30 —	Library
Quiet rural nighttime		Bedroom at night, concert
	— 20 —	
		Broadcast/recording studio
	— 10 —	
Lowest threshold of human hearing	— 0 —	Lowest threshold of human hearing

Source: Caltrans, 1998.

Characteristics of Noise

The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance, nuisance, dissatisfaction.
- Interference with activities such as speech, sleep, learning.
- Physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. No completely satisfactory method exists to measure the subjective effects of noise, or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists, and different tolerances to noise tend to develop based on an individual's past experiences with noise. Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted; the so called "ambient noise" level. In general, the more a new noise exceeds the previously existing ambient

noise level, the less acceptable the new noise will be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships occur (Caltrans, 1998):

- Under controlled conditions in an acoustics laboratory, the trained, healthy human ear is able to discern changes in sound levels of 1 dBA.
- Outside of such controlled conditions, the trained ear can detect changes of 2 dBA in normal environmental noise.
- It is widely accepted that the average healthy ear, however, can barely perceive noise level changes of 3 dBA.
- A change in level of 5 dBA is a readily perceptible increase in noise level.
- A 10 dBA change is recognized as twice as loud as the original source.

These relationships occur in part because of the logarithmic nature of sound and the decibel system. Sound level is measured in decibels. Because the decibel scale is based on logarithms, two noise sources do not combine in a simple linear fashion, but rather logarithmically. For example, if two identical noise sources produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA.

Noise attenuates as a function of the distance between the source and receptor. For sources of noise emanating from a single location (i.e., point sources), noise attenuates according to the inverse square law, i.e., at a rate of approximately 50 percent (6 dBA) for each doubling of distance. Assuming only this minimum attenuation without accounting for additional attenuation from other barriers and absorption by the ground surface, this approach underestimates attenuation in the real world and, therefore, provides a "worst-case" estimate of noise at the receptor.

Vibration Descriptors

Groundborne vibration generally is limited to areas within a few hundred feet of certain types of industrial operations and construction/demolition activities, such as pile driving. Road vehicles rarely create enough groundborne vibration amplitude to be perceptible to humans unless the receiver is in immediate proximity to the source or the road surface is poorly maintained and has potholes or bumps. Human sensitivity to vibration varies by frequency and by receiver. Generally, people are more sensitive to low-frequency vibration. Human annoyance also is related to the number and duration of events; the more events that occur or the greater the duration, the more annoying it becomes.

Vibrations caused by construction activities can be interpreted as energy transmitted in waves through the ground. These energy waves generally dissipate with distance from the vibration source (e.g., pile driving or sheetpile driving). Because energy is lost during the transfer of energy from one particle to another, vibration is less perceptible with distance from the source. As discussed above for noise, vibration attenuates as a function of the distance between the source and receptor. For sources of vibration emanating from a single location (i.e., point sources), vibration attenuates according to the inverse square law, i.e., at a rate of approximately 50 percent for each doubling of distance from the source. As discussed above, assuming only attenuation due to distance, tends to underestimate attenuation and, therefore, provides a "worst-case" estimate of vibration at the receptor.

Vibration is an oscillatory motion that can be described in terms of displacement, velocity, or acceleration. Peak Particle Velocity (PPV) is defined as the maximum instantaneous positive or negative peak of the vibration signal. PPV is used in assessing the potential for damage to buildings and structures and is expressed in inches per second (in/sec). The responses of human receptors and structures are influenced by a combination of factors, including soil/rock type, distance, duration, and the number of perceived events. Energy transmitted through the ground as vibration can reach levels that cause structural damage; however,

humans are very sensitive, and the vibration amplitudes that can be perceived by humans are well below the vibration that could potentially cause architectural or structural damage. A freight train passing at 100 feet can cause vibrations of 0.1 in/sec PPV, while a strong earthquake can produce vibration in the range of 10 in/sec PPV.

Existing Ambient Noise and Vibration Environment

Noise

The existing noise environment in the Project area is attributed to various stationary and mobile sources. These include noise originating from local vehicular and truck traffic and the operation of stationary sources (e.g., an existing composting facility to the west of the proposed Kettleman Reservoir) and mobile noise sources associated with local agricultural activities. Other, less prevalent, sources of noise that contribute to the existing noise environment in the construction areas include landscaping activities (e.g., leaf blowing, lawn mowing) and regional roadway traffic. Accordingly, existing ambient noise levels in rural areas typically range between 25 dBA at nighttime and 70 dBA during the day. Background noise levels in rural residential areas are typically 40 dBA and in agricultural cropland with equipment operating noise levels are 80 dBA on average.

Vibration

The existing vibration environment in the Project area is established by primarily the same sources as for noise, such as various stationary and mobile sources. These include vibrations originating from local vehicular and truck traffic and from the operation of stationary sources (e.g., an existing composting facility to the west of the proposed Kettleman Reservoir) and mobile noise sources associated with local agricultural activities. Field observations made during site visits indicate that the ambient vibration level was not at a perceptible level in the Project area or by nearby structures.

Sensitive Receptors

Noise

Some land uses are considered more sensitive to ambient noise levels than others due to the amount of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities typically involved. Residences, motels and hotels, schools, libraries, churches, hospitals, nursing homes, auditoriums, and parks and other outdoor recreation areas generally are more sensitive to noise than are commercial and industrial land uses, while schools and hospitals are generally the most sensitive. The closest hospitals to the Project area are at least five miles away in Avenal and Lemoore, and the closest schools in Kettleman City and Stratford are at least 3,000 feet away from the Project area. As this section will discuss, the only sensitive receptors in the vicinity of the Project consist of several rural residences.

Vibration

Sensitive vibration receptors for the proposed project are the same as the noise receptors presented above.

3.12.2 Regulatory Framework

Federal Policies and Regulations

Federal regulations establish noise limits for medium and heavy trucks (more than 4.5 tons, gross vehicle weight rating) under 40 CFR, Part 205, Subpart B (CFR, 2016). The federal truck pass-by noise standard is 80 dBA at 15 meters from the vehicle pathway centerline. These controls are implemented through regulatory controls on truck manufacturers.

State Policies and Regulations

The State of California establishes noise limits for vehicles licensed to operate on public roads. For heavy trucks, the State pass-by standard is consistent with the federal limit of 80 dBA (CFR, 2016; CCR, 1974). The State pass-by standard for light trucks and passenger cars (less than 4.5 tons, gross vehicle rating) is also 80 dBA at 15 meters from the centerline. These standards are implemented through controls on vehicle manufacturers and by legal sanction of vehicle operators by state and local law enforcement officials.

The State has also established noise insulation standards for new multi-family residential units, hotels, and motels that would be subject to relatively high levels of transportation-related noise. These requirements are collectively known as the California Noise Insulation Standards (Title 24, California Code of Regulations) (CCR, 1974). The noise insulation standards set forth an interior standard of L_{dn} 45 dBA in any habitable room. They require an acoustical analysis demonstrating how dwelling units have been designed to meet this interior standard where such units are proposed in areas subject to noise levels greater than L_{dn} 60 dBA. Title 24 standards are typically enforced by local jurisdictions through the building permit application process.

Local Policies and Regulations

Local regulation of noise involves implementation of General Plan policies and Noise Ordinance standards. Local General Plans identify general principles intended to guide and influence development plans, and Noise Ordinances set forth the specific standards and procedures for addressing particular noise sources and activities. General Plans recognize that different types of land uses have different sensitivities toward their noise environment; residential areas are generally considered to be the land use most sensitive to noise and industrial/commercial areas are generally considered to be the least sensitive. Local noise ordinances typically set forth standards related to construction activities, nuisance-type noise sources, and industrial property line noise levels. Noise regulations and standards that apply to the land uses within the unincorporated portions Kings County are provided below.

Kings County General Plan Noise Element

The Noise Element within the Kings County General Plan establishes non-transportation noise level standards for proposed projects, as shown in **Table 3.12-2** below (Kings County, 2010g). Because standards for transportation noise sources are generally less stringent, they are not presented. This section evaluates Project noises relative to speech and sleep interference thresholds (USEPA, 1974), which align closely with these noise standards.

Typical construction work hours would be Monday through Friday from 7:00 AM to 6:00 PM, but construction may take place during weekends if necessary. Nighttime construction activities (10:00 PM to 7:00 AM) are not anticipated. Noise associated with construction activities is considered temporary, but would adhere to applicable County Noise Element standards.

Table 3.12-2: Kings County Noise Element Standards

Table N-8 Non-Transportation Noise Standards
Average (Leq) / Maximum (Lmax)[1]

Receiving Land Use	Outdoor Area[2] Daytime	Outdoor Area[2] Nighttime	Interior[3] Day & Night	Notes
All Residential	55 / 75	50 / 70	35 / 55	
Transient Lodging	55 / 75	---	35 / 55	4
Hospitals & Nursing Homes	55 / 75	---	35 / 55	5, 6
Theaters & Auditoriums	---	---	30 / 50	6
Churches, Meeting Halls, Schools, Libraries, etc.	55 / 75	---	35 / 60	6
Office Buildings	60 / 75	---	45 / 65	6
Commercial Buildings	55 / 75	---	45 / 65	6
Playgrounds, Parks, etc.	65 / 75	---	---	6
Industry	60 / 80	---	50 / 70	6

Notes:
1. The Table N-8 standards shall be reduced by 5 dB for sounds consisting primarily of speech or music, and for recurring impulsive sounds. If the existing ambient noise level exceeds the standards of Table N-8, then the noise level standards shall be increased at 5 dB increments to encompass the ambient.
2. Sensitive areas are defined acoustic terminology section.
3. Interior noise level standards are applied within noise-sensitive areas of the various land uses, with windows and doors in the closed positions.
4. Outdoor activity areas of transient lodging facilities are not commonly used during nighttime hours.
5. Hospitals are often noise-generating uses. The exterior noise level standards for hospitals are applicable only at clearly identified areas designated for outdoor relaxation by either hospital staff or patients.
6. The outdoor activity areas of these uses (if any), are not typically utilized during nighttime hours.

Source: Kings County General Plan Noise Element (2010).

3.12.3 Impact Analysis

Methodology for Analysis

Noise

The noise impact assessment evaluates short-term (temporary) impacts associated with the construction of Project facilities, as well as long-term (permanent) impacts resulting from Project O&M. For construction noise, the potential for impacts was assessed by considering several factors, including the proximity of project-related noise sources to sensitive receptors, typical noise levels associated with construction equipment, the potential for construction noise levels to interfere with daytime and nighttime activities, the duration that sensitive receptors would be affected, and whether proposed activities would occur outside the construction time limits specified in local ordinances. For operational noise, the potential for impacts

was assessed by evaluating the noise generation potential of Project facilities; if the project would introduce a new source of noise, the evaluation considered the proximity to sensitive receptors and the potential for operational noise to be consistent with noise ordinance limits at the nearest receptors.

Vibration

Project grading and facility construction would cause vibration that could disturb nearby residents or cause cosmetic damage to buildings, structures, or the adjacent freeway structures. The impact assessment for vibration assesses whether construction would result in excessive groundborne vibration. The vibration impact analysis uses standard analytical methodologies, such as estimating vibration levels at sensitive receptors for a given vibration source and setback distance, comparing the estimated vibration level to recommended limits or significance thresholds, determining potentially significant impacts on nearby sensitive receptors, and providing mitigation where applicable.

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines*, a noise impact would be considered significant if the Project would cause:

- Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.
- 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, exposure of people residing or working in the project area to excessive noise levels.
- For a project within the vicinity of a private airstrip, exposure of people residing or working in the project area to excessive noise levels.

Noise

Construction noise sources would include a variety of heavy equipment and other machinery. The Federal Transit Administration (FTA) has established guidance on noise and vibration impact assessments for construction equipment (FTA, 2006). The FTA recommends that for a rough estimate of construction noise levels that the noisiest two pieces of equipment be used to analyze the anticipated noise levels at sensitive receptors assuming:

- Full power operation for a full one hour.
- There are no obstructions to the noise travel paths.
- Typical noise levels from construction equipment are used.

Using these simplifying assumptions, the noise levels at specific distances can be obtained using the equations provided in the FTA guidance (FTA, 2006). The estimated noise levels are compared to the noise emission limits established by Kings County. While the above calculations apply to construction equipment,

truck traffic to and from the construction sites could also have the potential to create additional noise for residences and commercial establishments located along haul routes. Please see the *Chapter 3.17 Transportation* for more information on traffic related to Project construction.

To address the CEQA significance criterion regarding "substantial temporary or periodic noise increases in ambient noise levels" for the analysis of construction noise, a "substantial" noise increase is defined as an increase in noise to a level that causes interference with activities during the day and/or night. This noise impact assessment estimates noise levels associated with project construction and compares construction noise levels against a speech interference threshold where daytime construction would occur, and against a sleep interference threshold if nighttime construction could occur. Temporary exposure to noise from construction activities during the daytime above these thresholds (two weeks or less) is considered to result in a less than significant impact. This analysis uses the following criteria to define potential "substantial" noise impacts:

- *Speech Interference*. Speech interference is an indicator of impact on typical daytime and evening activities. A speech interference threshold, in the context of impact duration and time of day, is used to identify substantial increases in noise from temporary construction activities. Noise peaks generated by construction equipment could result in speech interference in adjacent buildings if the noise level in the interior of the building exceeds 45 to 60 dBA. A typical building can reduce noise levels by 25 dBA with the windows closed (USEPA, 1974). This noise reduction could be maintained only on a temporary basis in some cases, since it assumes windows must remain closed at all times. Assuming a 25-dBA reduction with the windows closed, an exterior noise level of 70 dBA at receptors would maintain an acceptable interior noise environment of 45 dBA. With windows open, exterior noise levels of 70 dBA would be reduced to 55 dBA, which would still provide acceptable interior noise levels but could cause occasional speech interference effects. It should be noted that such noise levels would be sporadic rather than continuous in nature, because different types of construction equipment would be used throughout the construction process. For this analysis, noise levels above the 70-dBA speech interference threshold that occur on consecutive workdays for longer than two weeks[1] is considered a significant noise impact.
- *Sleep Interference*. Based on available sleep criteria data, an interior nighttime level of 35 dBA is considered acceptable (USEPA, 1974). Assuming a 25-dBA reduction with the windows closed, an exterior noise level of 60 dBA at receptors would maintain an acceptable interior noise environment of 35 dBA. Since a 15-dBA reduction would occur with windows open, an exterior noise level of 50 dBA would be required to maintain an acceptable interior noise environment of 35 dBA. No construction work is expected to occur during the nighttime hours for this Project, so sleep interference is not included in the following analysis.

Vibration

Construction activity associated with the operation of heavy equipment and vibratory pile driving may generate localized groundborne vibration and noise. However, vibration from ground-disturbing construction activity is typically below the threshold of perception when the activity is more than 50 feet from the receiver. The impact of vibratory pile driving can potentially impact nearby buildings and sensitive receptors. Based on methods and equations described by FTA (FTA, 2006), the vibration levels in terms of peak particle velocity at specific distances can be obtained.

[1] Since construction would occur during warm weather (summer and fall), a maximum duration of two weeks at a time is applied for closed windows (needed to maintain an interior noise environment that allows for normal conversation), since residents without air conditioning would need to open windows for ventilation during warm weather.

The Federal Transit Administration recommends a vibration threshold of 0.2 in/sec PPV at the receptors for fragile buildings (FTA, 2006) and this threshold is appropriate to apply to any construction activities occurring during the daytime hours. At or above these levels, vibration could cause cosmetic damage to fragile buildings.

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to actions associated with the proposed Project are identified below along with a supporting rationale as to why further consideration is unnecessary and a no impact determination is appropriate.

- *Expose People Residing or Working in the Area to Excessive Noise Levels Near Public Airports* – The public airport significance criterion is not applicable to the Project. There are no public airports within two miles of the Project vicinity. Therefore, project implementation would not result in the long-term exposure of workers to excessive public airport-related noise levels, and no further discussion of this criterion is presented.

Impacts and Mitigation Measures

This section discusses potential impacts to noise that could result from construction and O&M of the Project. Mitigation measures are identified where appropriate.

Impact NOI-1 Temporary, Construction-Related Noise Increases in Excess of Noise Ordinance

Project-related construction activities would result in temporary noise increases at sensitive receptors located in the Project vicinity. Construction noise levels would vary at any given receptor depending on the type of construction activity, construction phase, equipment type and duration of use, distance between the noise source and receptor, and the presence or absence of barriers between the noise source and receptor. Typical construction equipment generates noise levels ranging from about 76 to 88 dBA at a distance of 50 feet from the source, with higher levels of about 86 to 98 dBA for certain types of earthmoving and impact equipment (e.g., jack hammers, pavement breakers, rock drills). Pile drivers can generate maximum noise levels of approximately 101 dBA at 50 feet. The rate of attenuation or reduction is about 6 dBA for every doubling of distance from a point source. **Table 3.12-3** lists noise levels 50 feet from the source for typical construction equipment expected to be used in the Project.

Table 3.12-3. Construction Equipment Noise at Closest Residential Receptors (dBA)

Equipment	Typical Noise Level, 1x Equipment (dBA) 50 ft. from Source	Typical Noise Level, 2x Equipment (dBA) 50 ft. from Source	Minimum Distance to Meet Speech Interference Threshold of 70 dBA (ft.)
Back hoes	80	83	223
Front-end loaders	85	88	397
10-wheel dump trucks	88	91	561
Cranes	88	91	561
Compactors	82	85	281
Flat-back delivery trucks	88	91	561
Earth movers	85	88	397
Bull dozers	85	88	397
Excavators	85	88	397
Water trucks	88	91	561
Concrete trucks	88	91	561
Pile-driver (Impact)	101	104	2,506

Source: U.S. Federal Transit Administration (2006)

Per the FTA's recommendation for a conservative noise assessment, the two noisiest pieces of equipment were used to estimate the A-weighted noise impacts shown in **Table 3.12-3**. Out of the common types of equipment listed in the table, pile drivers are by far the noisiest, where two pieces would produce a noise level of approximately 104 dBA. To remain below the speech interference threshold of 70 dBA, sensitive receptors would have to be more than 2,500 feet away from the source of noise. Assuming that pile drivers would not be used, the next noisiest construction equipment pieces on the list would produce noise levels of 88 dBA at a location 50 feet from the source, and 91 dBA when two of those pieces are used at the same time. To remain below the speech threshold in this case, sensitive receptors would have to be approximately 600 feet or further from the equipment.

Construction, Operations, and Maintenance

All Facilities

There are no sensitive receptors located near the Aqueduct Intertie facilities nor within the proposed Kettleman Reservoir location. However, the noise threshold may potentially be exceeded for some residential properties adjacent to the Blakeley Canal and nearby Empire Weir No. 2. There are residences in Kettleman City, approximately 2,500 feet away from Kettleman Reservoir's western border, and there are also a few residences located at Westlake Farms further to the north, approximately 600 feet east of the Blakeley Canal. Additionally, there are small residences located approximately 600 feet and 2,000 feet northeast of Empire Weir No. 2. Noise levels may potentially reach the speech interference threshold in these areas if pile drivers were used during construction of Kettleman Canal by Westlake Farms or during improvements on South Fork Canal or Empire Weir No. 2 near the sensitive receptors. However, it is unlikely that pile drivers would be required at these locations for Project construction. As such, no substantial noise increase is expected in the Project area as a result of construction noises, especially with **Mitigation Measure NOI-1** as described below. There are additional residential buildings along Blakeley Canal, but they were not included in the analysis because they appear abandoned according to map images and personal site visits.

There may also be a potential increase in noise levels due to construction-related traffic. Truck traffic would be generated by delivery of material and construction equipment. Trucks would access the Project area

mainly via Interstate 5, State Highway 41, and local and roads in the project area. The closest residential users to the Project are located along State Highway 41 by Blakeley Canal and at Kettleman City by Interstate 5, as described above. Given the existing highway traffic noises in those areas, noise increases associated with the Project's construction-related truck traffic are not expected to substantially affect any residential receptors in the project vicinity. Truck and construction equipment movement would also be limited and infrequent, with its effect in increasing noise levels considered less than significant. Please see *Chapter 3.17 Transportation* for more information on traffic related to Project construction.

In order to address noise annoyance that sensitive receptors and residents may experience from construction equipment, **Mitigation Measure NOI-1** would be implemented. While not all of the mitigation measure components are measurable, this mitigation measure would result in some reduction in noise levels. For instance, the use of mufflers typically can reduce noise levels by 5 to 10 dBA (EPA, 1974) and additional reductions would occur with the use of any sound barriers or obstructions. Simply limiting the construction hours and construction equipment being used at a time would also control noise levels to be below established thresholds.

Significance Determination before Mitigation

Potentially significant in two cases: (1) if pile driving is required for any construction; and (2) if multiple construction projects and/or high noise level equipment pieces are used at the same time.

Mitigation Measures

Mitigation Measure NOI-1: Implement Noise Controls

To reduce the impact of noise from construction activities the following measures shall be implemented to the extent feasible:

- Construction activities shall be limited to the hours of 7:00 AM to 6:00 PM, Monday to Friday.
- Construction staging areas shall be located away from existing residences.
- Construction equipment noise shall be minimized during project construction by muffling and shielding intakes and exhaust on construction equipment per the manufacturers' specifications and by shrouding or shielding impact tools. All equipment shall have sound-control devices no less effective than those provided by the manufacturer.
- Construction equipment noise shall be minimized by limiting the pieces of equipment operating simultaneously, especially if pile drivers are in use.
- All stationary noise generating construction equipment shall be placed as far away as possible from sensitive receptors or in an orientation minimizing noise impacts (e.g. behind barriers or storage piles).

Significance Determination after Mitigation

Less than significant.

Impact NOI-2 Temporary, Construction-Related Vibration Increases

The Federal Transit Administration recommends a vibration threshold of 0.2 in/sec PPV for fragile buildings (FTA, 2006). At or above these levels, vibration could cause cosmetic damage to fragile buildings. **Table 3.12-4** lists a variety of anticipated construction activities to occur at the Project area and associated vibration levels that may be generated at 25 feet from the source. The vibration levels in this table indicate

that operation of heavy construction equipment would not generate vibration levels that could cause threshold (cosmetic) damage to fragile buildings, unless pile drivers are used.

Table 3.12-4: Vibration Levels for Construction Equipment

Equipment	Peak Particle Velocity (PPV) (in/sec) at 25 Feet
Pile Driver (Impact)	
Upper Range	1.518
Typical	0.644
Pile Driver (Sonic or Vibratory)	
Upper Range	0.734
Typical	0.170
Large Bulldozer	0.089
Loaded Trucks	0.076
Jackhammer	0.035
Small Bulldozer	0.003

Source: U.S. Federal Transit Administration (2006)

Construction, Operations, and Maintenance

All Facilities

Vibration levels resulting from the use of anticipated equipment for Project construction are not expected to cause damage, and would cause only temporary annoyance for nearby receptors. However, if pile driving is required for this project, construction-related vibrations could exceed the 0.2 in/sec PPV threshold. This would potentially affect the areas near Interstate 5, located within approximately 50 feet of the Project area, creating a potentially significant vibration impact. Implementation of **Mitigation Measure NOI-2** would require any future pile driving activities associated with the Project to not exceed the 0.2 in/sec PPV threshold, which would ensure that adjacent freeway structures to the south are not subject to cosmetic damage, reducing potential vibration impacts to a less than significant level.

Significance Determination before Mitigation

Potentially significant if pile drivers are used during construction.

Mitigation Measures

Mitigation Measure NOI-2: Implement Vibration Controls

To ensure that structures adjacent to Interstate 5 are not subject to cosmetic damage, any pile driving activities associated with Project construction shall not exceed the 0.2 in/sec PPV threshold at these locations. Measures that may be employed to meet this performance standard include using sonic or vibratory pile drivers, where feasible, or pre-drilling pile holes.

Significance Determination after Mitigation

Less than significant.

Impact NOI-3 Increases In Ambient Noise Levels Due To Operational Noise and Vibration

Operational characteristics of proposed Project facilities would not be expected to generate vibration levels that could affect adjacent structures. Given the low vibration potential of Project facilities, combined with

the large setbacks from most adjacent structures, vibration effects associated with Project operations would be less than significant and are not discussed below.

Implementation of the proposed Project would introduce some new sources of noise as new facilities are developed. However, any operational noise generated by the Project would be temporary in nature as the proposed Project is expected to operate for periods lasting from 15 to 140 days, three out of every ten years. Furthermore, noise-generating facilities would be located away from sensitive receptors, thus causing minimal to no interior noise level impacts. Operational noises from traffic would also be limited to a very small number of infrequent vehicle trips for inspection, maintenance, and monitoring of the facilities.

Construction, Operations, and Maintenance

Storage and Conveyance Facilities

Once constructed, the Project's leveed impoundments and conveyance facilities are not expected to generate any noise concerns above existing ambient levels without the Project. Potential noise sources during Project operations may include noise originating from the pumping plants and noise associated with vehicular trips for maintenance and monitoring activities. Maintenance activities would require transportation of minimal heavy equipment to the Project area and a maintenance crew. However, maintenance activities will be infrequent and short-term in duration, and are not expected to increase the ambient noise levels above any existing levels without the proposed Project. Potential noise sources during operation of the Aqueduct Intertie facility may include noise from operation of the gates which would be remotely controlled, but would be equipped with a manual override. Operational noise associated with the turn-in/turn-out structures would be minimal and mainly resulting from vehicle trips to and from the facilities for inspection and maintenance. In both cases, noises relating to Project operations would be infrequent (as the proposed Project would operate, on average, three out of ten years) and short-term in duration.

Other Facilities

Once constructed, the Project's electrical switchyard and substation and maintenance yard are not expected to generate noise concerns significantly above existing ambient levels without the Project. The electrical switchyard and substation would be adjacent to the pumping plant, contain a crushed rock base and be surrounded by a chain-link fence. The transformers at the electrical substation would create a humming, buzzing noise level from 60 to 80 dBA, lower than the noise level of most construction equipment. The substation noise would not be continuous, and would generally be masked by nearby transportation noises from both Interstate 5 and State Highway 41. The maintenance yard would also be located by the Kettleman Pumping Plant #2. Noise at the maintenance yard would primarily be due to equipment pick up and drop off during inspection and maintenance of the facilities. As described above, the number of operational visits, both to the electrical switchyard substation and to the maintenance yard, would be minimal and infrequent, and those trips would not create significantly adverse impacts effecting the existing noise environment in the given area.

The majority of the Project's operational noise would result from pumping plants. As previously described, there would be up to two pumping plants external to the Kettleman Reservoir; the Kettleman Pumping Plant #1 would contain up to nine low-head, high volume pumping units and would be located near the intersection of the South Fork Canal and the new Kettleman Canal, and the Kettleman Pumping Plant #2, associated with the Aqueduct Intertie, would contain up to twelve high-capacity vertical turbines, below-grade pump and motor units. Operation of these proposed pumping plants would result in the generation of noise from pump machinery; however, both Kettleman Pumping Plant #1 and #2 would be at least two miles away from the nearest sensitive receptors. Operating all units at the maximum flowrate condition of 2,100 cfs, the respective estimated total power of the pumping plants would be approximately 8,000 hp and

53,000 hp. Given the rated power, limited operational time, and the distance to the nearest sensitive receptors, noise generated by the external pump stations at the sensitive receptors would generally correspond to existing noise levels from nearby highway traffic and would therefore be considered less than significant.

In addition to these 'external' pumping plants, there would be up to five pump stations associated with moving water from the Kettleman Canal into the Kettleman Reservoir for storage. (Water to be stored in the reservoir would be pumped from the Kettleman Canal into the Kettleman Reservoir. Water to be recovered from storage would flow via gravity from the reservoir's storage cells into the Kettleman Canal.) Operation of these internal pump stations would also result in the generation of noise from pump machinery. Land use surrounding the reservoir' sites is agricultural with closest residences located in Kettleman City, at least a mile away. Operating all pump units at the maximum flowrate condition of 2,100 cfs, the Kettleman Conveyance is estimated power is estimated to be approximately 6,000 hp. Considering the small pump sizes, limited operational time, and long distance to the nearest sensitive receptors, noise generated by the internal pump stations would generally correspond to existing noise levels in the receptor area. Therefore, the storage facilities' noise impact would be less than significant.

Although noise produced at the Project's electrical substation and pumping plants would not be continuous, they could potentially be significant during Project operations. To further minimize these operational noises, **Mitigation Measure NOI-3** would require noise controls on the machinery.

Significance Determination before Mitigation

Less than significant/ Potentially significant.

Mitigation Measures

The following measure shall be applied to the proposed machinery:

Mitigation Measure NOI-3: Employ Noise Controls for Electrical Substation and Pump Stations

The best available noise control techniques (including mufflers, intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds) shall be used, as necessary, on machinery associated with the Project in order to comply with applicable Kings County General Plan Noise Element limits, adjusted to reflect ambient noise levels occurring at the time of project implementation.

Significance Determination after Mitigation

Less than significant.

Impact NOI-4 Noise Exposure from Private Airstrips

According to the following map from the Kings County General Plan Circulation Element (2010), there are three private air strips within the Project area (**Figure 3.12-1**):

- Two air strips, Westlake and Newton, are located along State Highway 41, adjacent to Blakeley Canal and north of Kettleman Reservoir.
- An airstrip is shown on the map to be located in Kettleman City; however, the airstrip is believed to no longer exist based on aerial map images and 2016 Project site visits. As such, it is not included in the following impact discussion.

Construction, Operations, and Maintenance

All Facilities

Project workers could potentially be exposed to noise levels from private airstrips located along Blakeley Canal; however, noise levels from aircrafts using these private airstrips would be intermittent and generally much lower than from the construction equipment used at the site (primarily due to proximity). Additionally, the OSHA requires that workers be provided with personal protective equipment when construction sound levels exceed 90 dBA for an eight-hour duration per day (OSHA, 2016). According to the noise calculations, Project construction equipment noises alone could potentially exceed this threshold at sensitive receptors. Thus, noise from private airstrips could potentially be a noise concern as part of cumulative exposure.

Project O&M would only require the presence of workers on an intermittent basis for inspection and maintenance. Therefore, exposure to noise from the adjacent private airstrips would be temporary in nature and not substantially different from similar exposures of nearby residents.

Significance Determination before Mitigation

Potentially cumulative and significant if noise from private airstrips coincide with noisy construction equipment.

Mitigation Measures

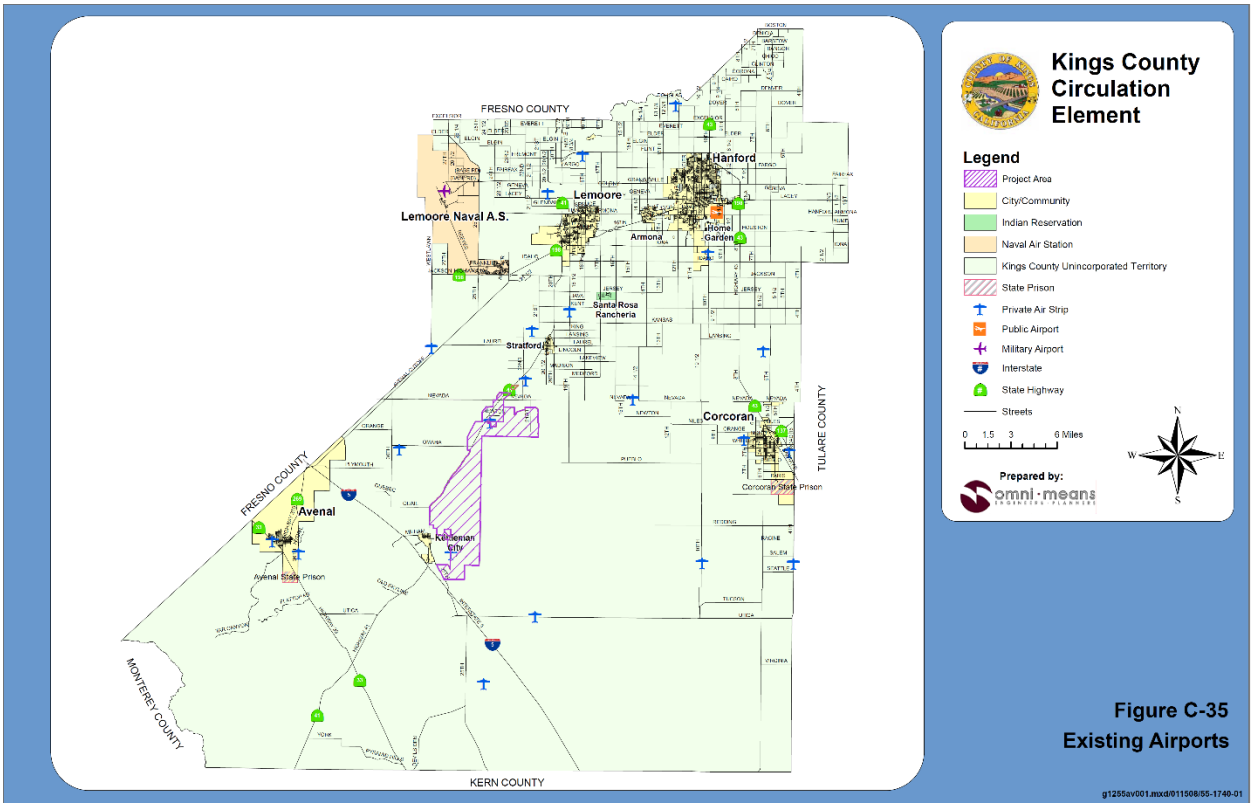
Mitigation Measure NOI-4: Employ Personal Protective Equipment

To ensure that workers are protected from excessive noise levels, all workers shall use OSHA-mandated personal protective equipment as necessary to avoid combined noise levels above established noise standards.

Significance Determination after Mitigation

Less than significant.

Figure 3.12-1: Map of Existing Airports in Kings County



Source: Kings County General Plan Circulation Element (2010).

Cumulative Impacts

For noise and vibration, the geographic scope of potential cumulative impacts is limited to the immediate Project vicinity as well as areas adjacent to any routes designated for access and deliveries. There are six relevant projects within the vicinity of the proposed Project that may contribute to cumulative impacts:

- Quay Valley Community Development - a new 7,175-acre community to be developed in south Kings County.
- Kettleman Hills Facility Expansion - expanding the existing B-18 Landfill and construct a new B-20 Landfill for hazardous waste and designated waste disposal.
- Kettleman City Surface Water Treatment Plant and Commercial Water Storage Tanks (Treatment Plant) – construction of a new surface water treatment plant to treat surface water for potable supply.
- Southwest Groundwater Banking Project – development of a project to divert and store floodwater from the Kings River and local stormwater.
- JID Distributed Recharge Bypass and Lassen Projects – improvement to and construction of recharge facilities to divert and store floodwater from the Kings River.
- Terranova On-Farm Flood Capture and McMullin Recharge Site – improvements to and construction of facilities to divert floodwater from the Kings River for recharge on existing farm lands.

Construction

Temporary increases in ambient noise and vibration levels during construction of the proposed facilities would not be cumulatively considerable given the short-term nature of the impacts. Regarding noise from construction, the cumulative analysis of impacts is limited to the time when the construction activities occur and the proximity of other projects under construction or other sources of noise in the immediate vicinity of proposed Project construction activities. Construction impacts do not occur once construction has ceased. Reasonably foreseeable future projects could contribute to a cumulatively significant impact but only if located in proximity to the Project area and occurring at the same time. Because the proposed Project's footprint is well defined, it is unlikely that construction of some projects may overlap with construction of the proposed Project.

Vibration impacts are often associated with construction activities. Reasonably foreseeable future projects could contribute to a cumulatively significant impact but only if located in proximity to the Project area. As with construction noise, reasonably foreseeable future projects located within the County's jurisdiction would not be close enough to result in a cumulatively considerable vibration effects. Therefore, vibration impacts would not be considered cumulatively considerable.

Operations & Maintenance

As stated above, vehicle trips associated with the operations of the Project would be minimal and infrequent, such that their incremental noise impacts would not be cumulatively considerable. **Mitigation Measure NOI-3** requiring noise controls would also reduce operational noise impacts from pump stations to not be cumulatively considerable. Furthermore, cumulative noise impacts would continually be attenuated by the distances between each of the projects and the proposed Project. Therefore, O&M noise and vibration impacts would not be considered cumulatively considerable.

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3.13 Oil, Gas and Mineral Resources

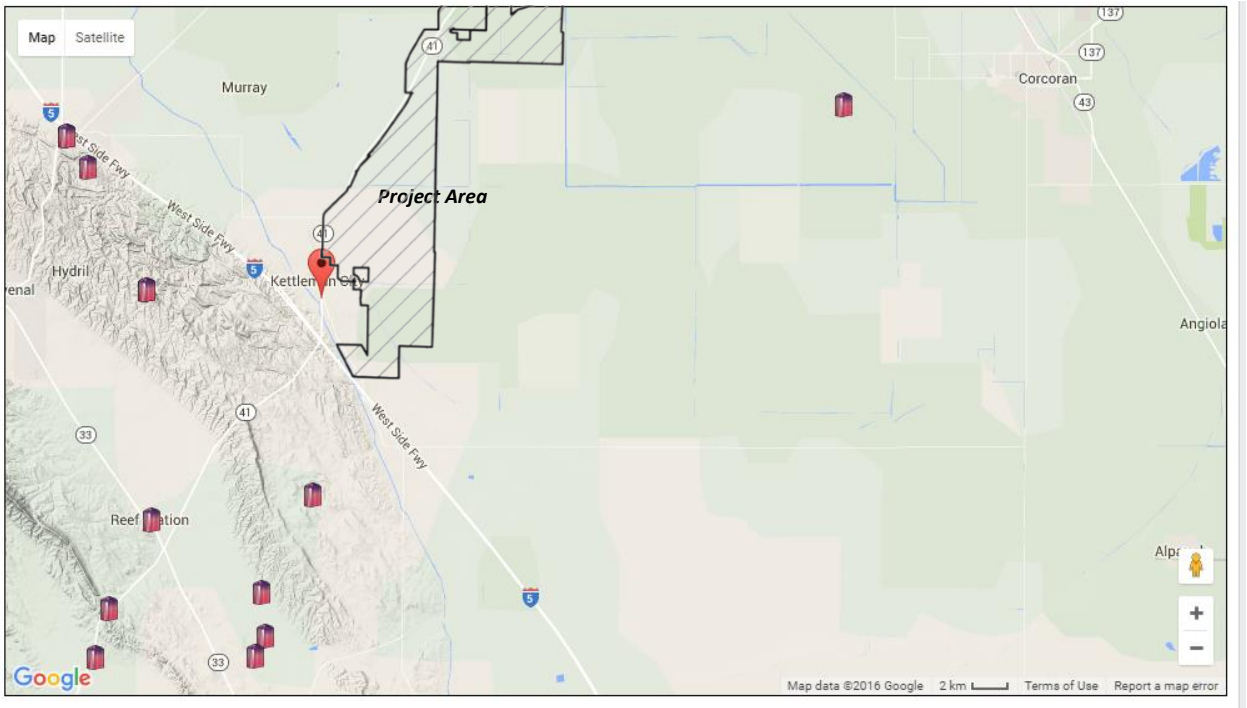
This section presents the physical and regulatory setting for oil, gas and mineral resources within the Project area, while the impact analysis considers the potential for the Project to affect the availability of mineral resources, resource extraction or restoration activities, or result in land use impacts, and provides mitigation measures that would reduce these impacts.

3.13.1 Environmental Setting

Historical and Current Oil and Mineral Production

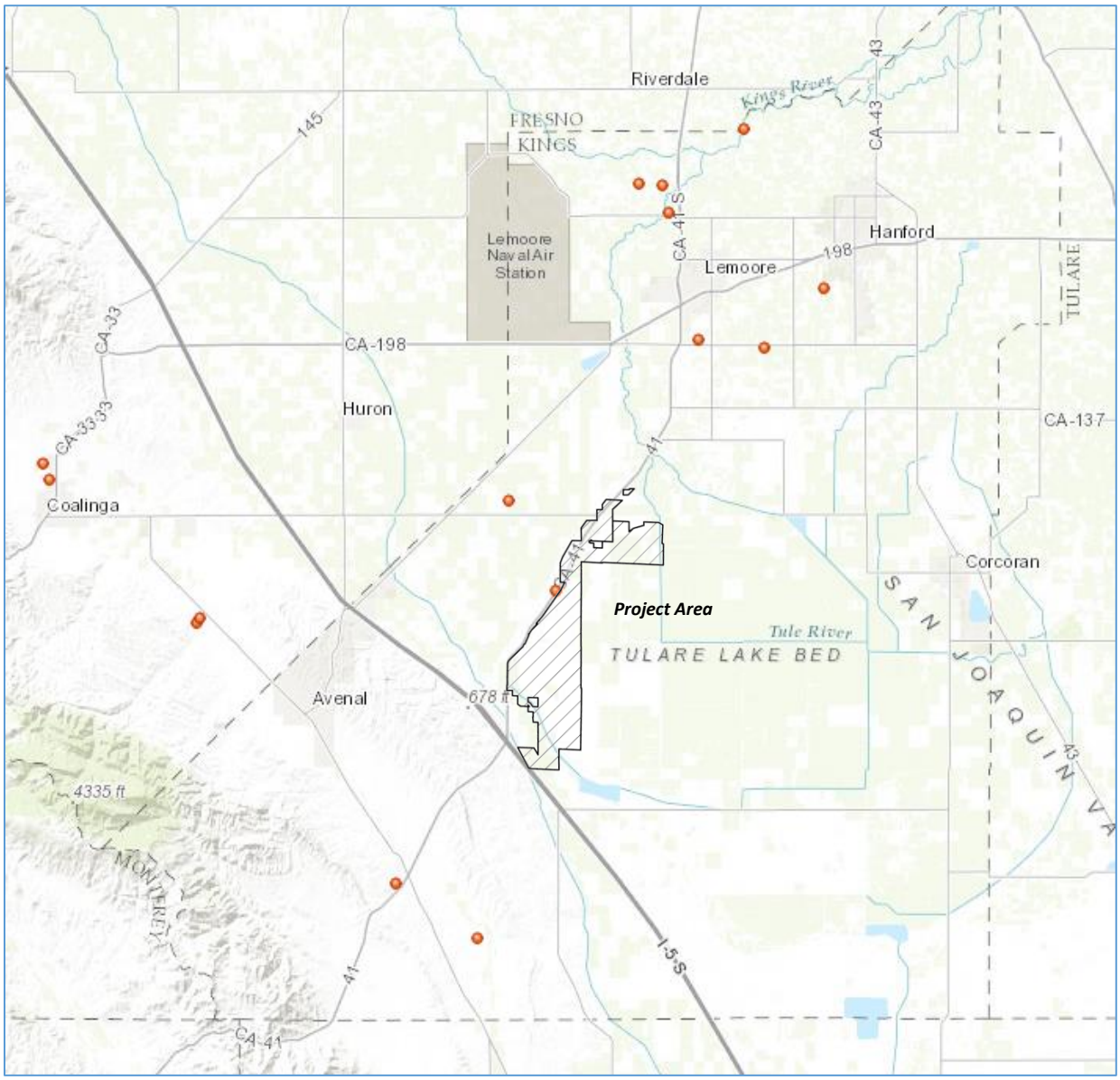
Although Kings County is primarily known for its agricultural production, it also has a history of mineral production that continued through the late 1960s due to the abundance and variety of mineral resources that are present in the county. Extracted resources included aggregate products (sand and gravel), fossil fuels (oil and natural gas), metals (chromite, anapaite, magnesite, and quicksilver), and other minerals used in construction or industrial applications (fuller's earth, gypsum, brick, mineral paint, and montmorillonite). **Figure 3.13-1** and **3.13-2**, and **Table 3.13-1** and **3.13-2**, illustrate and describe the locations and types of mineral resources extraction activities that occurred in the Project area**.** Historic local mineral mining operations included an open pit gypsum mine (the Glen C. Archer Gypsum Mine) and a mercury mine (referred to as either the Parkfield Mine, Kings Mine, or Fredana Mine) in southwestern Kings County. Mining operations throughout the county ceased in the 1960s. The surface mining sites closest to the Project area include the Kettleman Plain Quarry, Avenal Gap Mine, and Canyon Mine, which were primarily gypsum mining operations.

Figure 3.13-1: Map of Mineral Resources Sites near the Project Area



Source: Mindat, 2016.

Figure 3.13-2: Mines in Kings County



Source: ESRI, 2016

The majority of mines in Kings County are abandoned, as shown in **Table 3.13-1**. In 2016, the Hewitson Cattle Company Mine (ID No. 91-16-0010) was still listed under the State Surface Mining and Reclamation Act's (SMARA's) California's Public Resources Code, Section 2717(b) (also known as the AB 3098 List) as a mine with an approved reclamation plan with a permit and an Interim Management Plan, allowing mineral production to begin at any time (CDOC, 2016).

Table 3.13-1: Minerals/Mines Found Near the Project Area

Mine Name	Distance from Project Area (miles)	Mineral Mined	Operation Type (Close/Surface)	Dates in Operation
Avenal Gap Mine (Holloway; Glen C. Archer)	8 miles S	Gypsum	surface	1954-57, 1958
Canyon Mine (C.E. Boyd prospect; E-B)	14 miles SW	Gypsum, Fullers Earth & Montmorillonite	surface	1913
Hewitson Cattle Company Mine	15 miles SE	Aggregate mine	surface	
Kettleman Plain Quarry	11 miles SW	Gypsum Anhydrite	surface	1947
Lewis Well	8.5 miles NE	Anapaite[1]	N/A	N/A
McPhaill Gypsum Company	12 miles SW	Gypsum	surface	1954, 1962-67
Reef Station	7 miles SW	Gypsum & Montmorillonite	N/A	N/A
Tar Peak	10 miles SW	Chromite[1]	N/A	N/A
Unnamed Aragonite-Gypsum Occurrence	6 miles S	Aragonite Gypsum	N/A	N/A
Unnamed Road Metal Quarry	9 miles SW	Stone Quarry[1]	surface	N/A

Table 3.13-2: Abandoned Mine Lands (AMLs) in Kings County

Mine Name	Distance from Project Area (miles)	Mineral Mined	Operation Type (Close/Surface)	Year of Reclamation Plan Approval
Agricultural Gypsum	9 miles S of Kettleman Reservoir	Gypsum	Open Pit	2002
E & B Trucking	12 miles NE of Empire Weir No. 2	Sand & Gravel	Open Pit	1998
Hewitson Cattle Company Mine	8 miles SW of Kettleman Reservoir	Sand & Gravel	Open Pit	2014
McIntyre Reclamation	7 miles NE of Empire Weir No. 2	Sand & Gravel	Open Pit	2008
Westlake Farms	Located within Kettleman Reservoir	Quarry	Fill Dirt	2003
Wood Bros Inc.	6 miles NE of Empire Weir No. 2	Sand & Gravel	Open Pit	1998

Source: ESRI, 2016
Notes:
1. Not mined, just a registered occurrence

At present, there are no active surface mining operations occurring within Kings County and the California Division of Mines and Geology has not identified any significant mineral resources within the County (DOGGR, 2013b). Open pit mining is regulated by SMARA, which requires a local permit, financial assurance that the site can be restored post-mining, and a reclamation plan. The County will continue to allow mining and mineral extraction as a conditional use where land use conflicts are avoided, environmental resources are not substantially degraded, and proper reclamation is assured, consistent with the requirements of the Kings County Surface Mining and Restoration Ordinance.

In 2009, the County had maintained only one surface mining permit for a non-active gravel operation, and two agricultural reclamation sites that were fully reclaimed (Kings County, 2010i). Only limited amounts of soil, sand, and some gravel are excavated for commercial use (Kings County, 2010i), and currently, the only substances mined are sand and gravel for commercial use, or the occasional mining of topsoil from a farm performing leveling activities to facilitate better drainage (Kings County, 2010i).

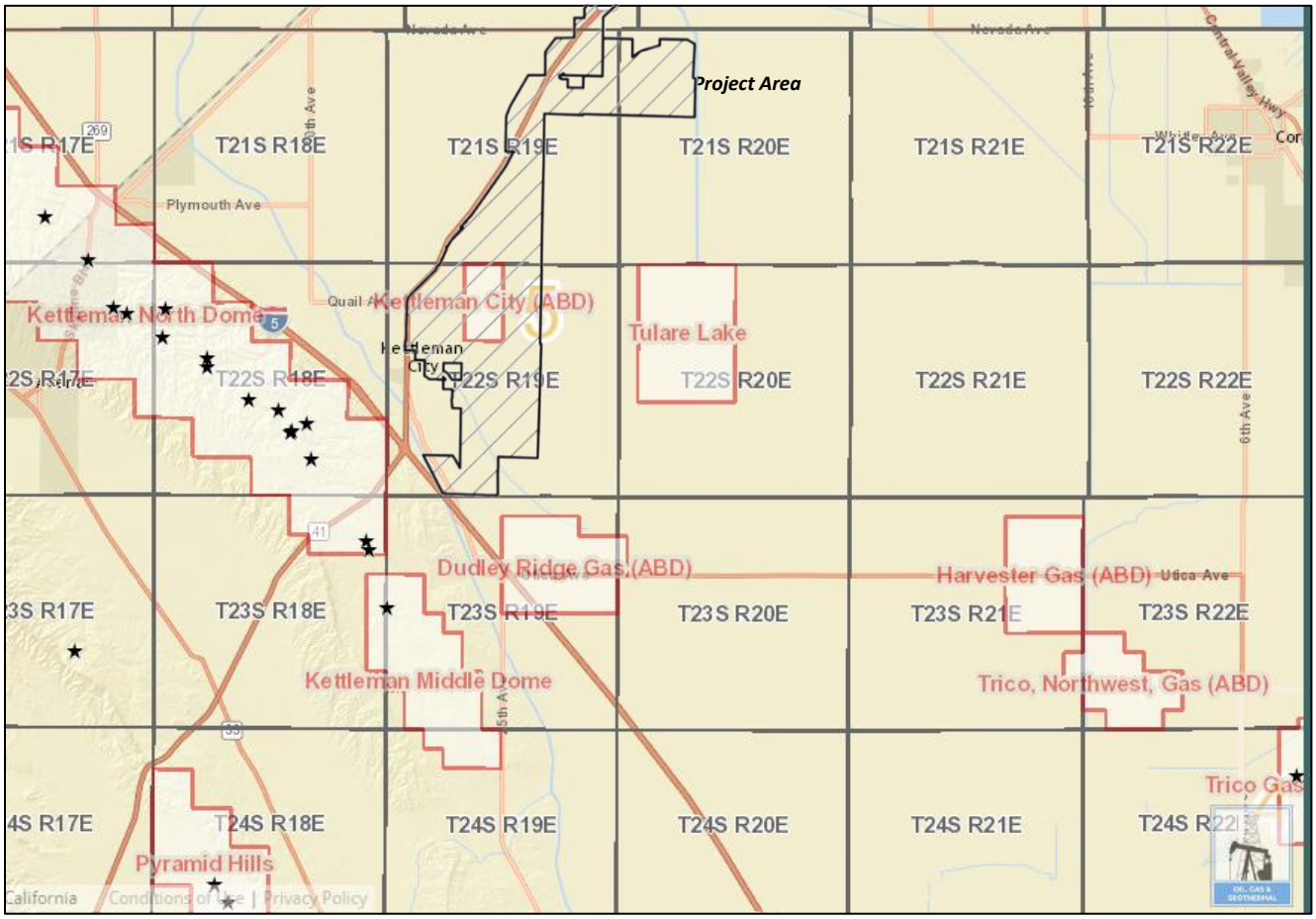
Oil and Gas Production

Oil and gas reserves have been identified in and extracted from portions of Kings County, generally within existing open space areas and unincorporated areas in the county. Petroleum reserves are located within the organic-rich, oil-prone source rocks of the upper Miocene-Monterey Formation, Eocone Kreyenhagen Formation, and the Tumery-Temblor petroleum system (USGS, 2007). Natural gas and natural gas liquids occur in the Moreno Formation and in organic-rich sandstones as hydrocarbon gases (USGS, 2007). The principal active resource fields in the area are located less than ten miles from the Project area and include the Pyramid Hills, Kettleman Middle Dome, Kettleman North Dome, and Tulare Lake oil fields, and the Dudley Ridge, Harvester (abandoned), Northwest Trico (abandoned), and Kettleman City gas fields, as shown in **Figure 3.13-3**. The Kettleman North Dome oil field is ranked as the 15th largest oil field in

California by total ultimate oil recovery, with a cumulative production of 458,800 million barrels (DOGGR, 2006). It is also one of the top twenty oil fields closest to exhaustion, with less than 0.5% of its total original oil remaining in place (DOGGR, 2006).

Oil and gas production began in Kings County in the early 1900s and has contributed to the local economies since that time. (Kings County, 2010i). Oil and gas produced by the County's oil fields in 2012 is shown below in **Figure 3.13-3** and **Table 3.13-3**.

Figure 3.13-3: Local Oil and Gas Fields



Source: CDOC, 2013

Table 3.13-3: Oil and Gas Production from Kings County (2012)

Oil Field	Oil Production (bbl)[1]	Net Gas Withdrawn (MCF)[2]
Kettleman City (Abandoned)	68	0
Kettleman Middle Dome	57,570	111,620
Kettleman North Dome	25,789	82,379
Tulare Lake	7,343	0
Totals	***90,0770***	***193,999***
District 5 (Onshore) Totals	***6,123,950***	***948,965***
State (Onshore) Totals	***197,510,422***	***168,197,583***

Source: CDOC, 2013
Notes:
1. bbl = billion barrels
2. MCF = thousand cubic feet

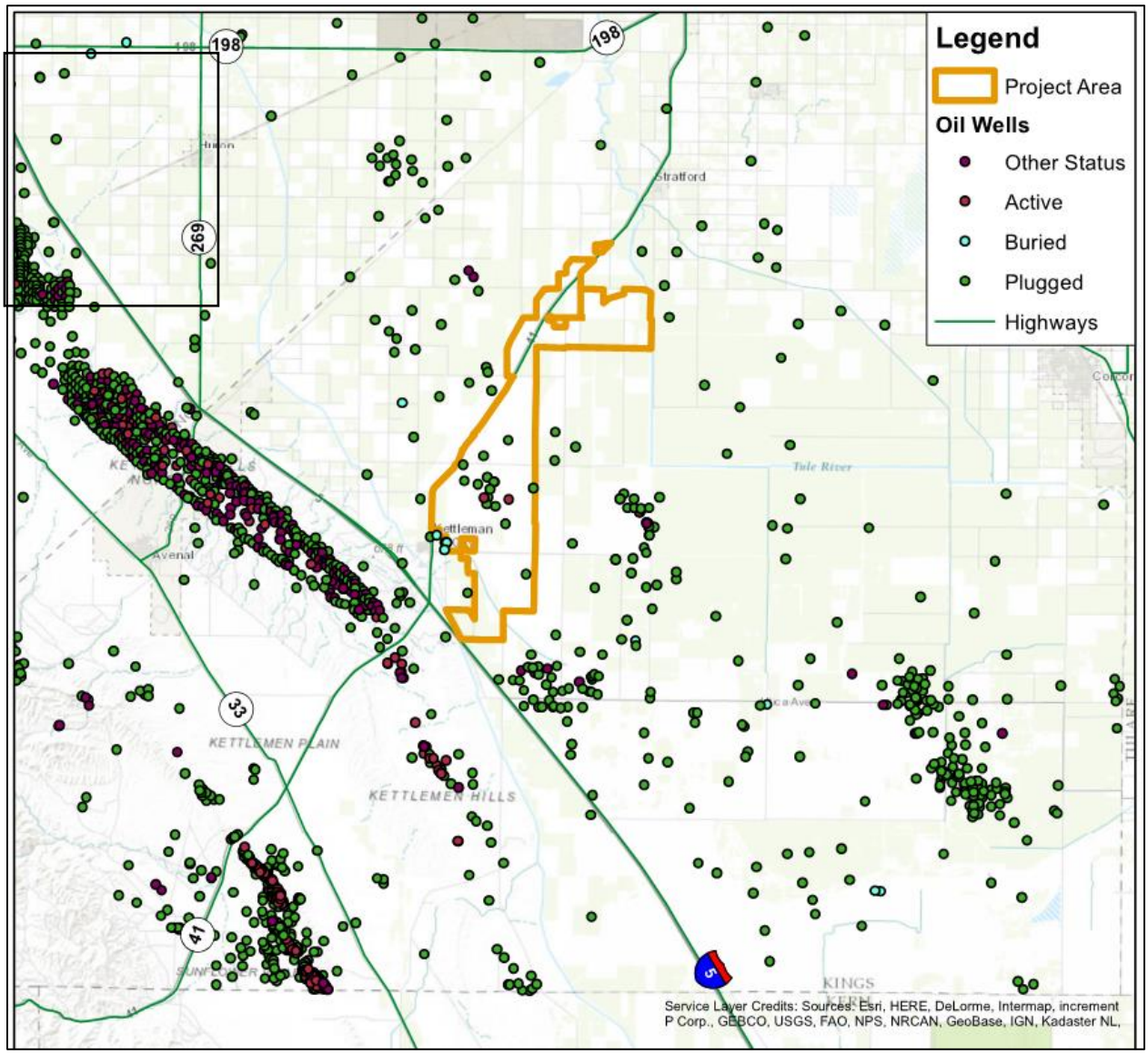
Although significant volumes of oil and gas have been produced in the County, production has declined over the last 40 years. The Dudley Ridge and Northwest Trico gas fields have been abandoned, and the active and abandoned fields contain numerous active, idle, and abandoned oil and gas wells as well as abandoned non-producing ("dry") exploratory wells. In addition, numerous abandoned dry wells are located outside the boundaries of the fields. The California Department of Conservation's DOGGR maintains records of the location and details of constructed and abandoned oil and gas wells in the state. In total, there are 340 wells in Kings County, as shown in **Table 3.13-4.** There are 17 wells within the boundary of the proposed Kettleman Reservoir. Fifteen of these wells are plugged and abandoned; however, there are two active wells that have been drilled and completed, as shown in **Figure 3.13-4**.

Table 3.13-4: Well Counts and Production of Oil and Gas in Kings County, 2014

Well Count[1]		Oil Production (bbl)[2]	Total Gas Production (MCF)
Active	Inactive		
185	205	165,080	127,244

Source: CDOC, 2013
Notes:
1. Includes well count from Oil & Gas (OG), Dry Gas (DG), and Gas Storage (GS)
2. Includes condensate produced from Dry Gas (DG) and Gas Storage (GS)

Figure 3.13-4: Oil Wells in the Project Area



Source: Division of Oil, Gas, and Geothermal Resources Well Finder, 2016b.

After nearly a century of oil extraction, oil deposits in the area have been greatly reduced. However, continued extraction and new exploratory drilling using advanced oil extraction technologies is ongoing to tap remaining oil and gas reserves from previously depleted areas. Techniques, such as the use of slant-drilling, could allow multiple wells to be consolidated within smaller, enclosed spaces that do not need to be located directly over the deposits. The County's future energy production is likely to emphasize alternative energy sources that avoid or minimize production of greenhouse gases, but new oil and gas sources could be allowed in certain areas (Kings County, 2010i).

In 2010, Zodiac Exploration Inc. and Aera Energy LLC drilled two exploratory wells due to interest in resurrecting oil production in the region using vertical drilling methods and fracking (Nidever, 2011). The two active wells (Well No. 4-9 and 1-10) in the Project area (located within the Kettleman Reservoir site),

are operated by the California Resources Production Corporation under lease by Zodiac. Drilling for Well No. 4-9 (located in the Kettleman City Oil Field) began in 2010, and production commenced in March 2011 when wellhead oil and gas production equipment was installed (Zodiac, 2013). Drilling began on June 14, 2011 for Well No. 1-10 and has yet to be completed as the wellhead oil and gas production equipment has not yet been installed (Zodiac, 2013). New oil development located within the Project area could lead to economic benefits for the local economy, including job development and attracting new manufacturers to this region in California, as well as associated impacts.

3.13.2 Regulatory Framework

Federal Policies and Regulations

National Energy Policy

The National Energy Policy was established by the National Energy Policy Development Group (NEPDG) in 2001 to help the private sector and, as appropriate, state and local governments promote dependable, affordable, and environmentally sound production and distribution of energy for the future. Modernizing energy conservation and energy infrastructure, increasing energy supplies, increasing energy security, and protecting the environment are all goals of the policy.

Mining and Mineral Policy Act

The Mining and Mineral Policy Act of 1970 was developed to encourage the federal government to create an "economically sound" mining industry for economic and national security reasons. This act encourages private enterprise in the development of a sound and stable domestic mineral industry and an orderly economic development of mineral resources, research, and reclamation methods. In addition, it promotes the study and development of methods for the disposal, control, and reclamation of mineral waste products, as well as the reclamation of mined lands to lessen the environmental impacts of mining's many aspects and activities.

State Policies and Regulations

Surface Mining and Reclamation Act

The SMARA legislation of 1975 protects mineral resource zones (MRZs). The act classifies mineral resources in the state and transmits the information to local governments in order to regulate land use relative to mineral resources. Sections 2761(a), 2761(b) and 2790 of SMARA require a mineral lands inventory process (termed classification-designation) to be administered by the California Division of Mines and Geology and State Mining and Geology Board. The objective of the process is to provide local agencies with information on the location, need, and importance of minerals within their respective jurisdictions. This information can then be used for local land use planning decisions. Areas are classified based on geologic factors, without regard to existing land use and land ownership. During the inventory process, areas are categorized by aggregate resources (sand, gravel, and stone), and are mapped with the delineation of MRZ 1 through 4, where:

- **MRZ-1.** Areas where available geologic information indicates that there is minimal likelihood of significant resources.
- **MRZ-2.** Areas underlain by mineral deposits where geologic data indicate that significant mineral deposits are located or likely to be located (this is considered the most important zone).
- **MRZ-3.** Areas where mineral deposits are found but the significance of the deposits cannot be evaluated without further exploration.

- **MRZ-4.** Areas where there is not enough information to assess the zone. These are areas that have unknown mineral resource significance.

Areas designated by the Mining and Geology Board as "regionally significant" are incorporated by regulation into Title 14, Division 2 of the California Code of Regulations. Such designations require that a lead agency's land use decisions involving designated areas are made in accordance with its mineral resource management policies, and that they consider the importance of the mineral resource to the region or the state as a whole, and not just the lead agency's jurisdiction.

Kings County adopted a SMARA Ordinance (Chapter 17 of the Kings County Code of Ordinance) in 1996 to establish itself as the lead agency for issuing SMARA permits within the unincorporated portions of the County. Kings County will continue to allow mining and mineral extraction as a conditional use if land use conflicts are avoided, environmental resources are not substantially degraded, and proper reclamation is assured, consistent with the requirements in the Kings County Surface Mining and Restoration Ordinance (Chapter 17 of the Kings County Code of Ordinance). These objectives are further outlined in an implementation program in the Kings County General Plan Resource Conservation Element, which outlines programs designed to fulfill the policies and objectives specified in the General Plan. Kings County Resource Conservation Program No. 6 specifies the continued implementation and administration of the Kings County SMARA Ordinance, and coordinates SMARA Permits with the State Office of Mine Reclamation to effectively manage the County's mineral resources (Kings County, 2010i).

Senate Bill 1281

Senate Bill 1281 amends Public Resource Code Section 3227 by requiring a quarterly water report to be filed online by all oil and gas well owners. The existing law under Section 3227 DOGGR in the DOC regulates the drilling, operation, maintenance, stimulation, and abandonment of oil and gas wells in the state. The law requires the owner of any well to file with the State Oil and Gas Supervisor a monthly statement that provides certain information relating to the well, including what disposition was made of the water produced from each well. Senate Bill 1281 requires a statement to the supervisor to include the source and volume of any water reported, along with water used to generate or make up the composition of any injected fluid or gas. This amendment also requires this quarterly report to include additional information such as the treatment of water and the use of treated or recycled water in oil and gas field activities.

Public Resources Code Section 3208.1

No building intended for human occupancy may be located near any active oil or gas well unless suitable safety and fire protection measures and setbacks are approved by the local fire department. The State Oil and Gas Supervisor is authorized to order the re-abandonment of any previously plugged and abandoned well when construction of any structure over or in the proximity of the well could result in a hazard. In addition, if any plugged and abandoned or unrecorded wells are damaged or uncovered during excavation or grading, the State requires specific notification and remedial plugging operations.

Public Resources Code Section 2762

PRC Section 2762 of the SMARA states that within 12 months of receiving the mineral information described in Section 2761, and also within 12 months of the designation of an area of statewide or regional significance within its jurisdiction, every lead agency shall, in accordance with state policy, establish mineral resource management policies to be incorporated in its general plan that will recognize mineral information classified by the State Geologist. This will assist in the management of areas of statewide and regional significance, and help emphasize the conservation and development of identified mineral deposits.

Division of Oil, Gas, and Geothermal Resources

The DOGGR supervises the drilling, operation, maintenance, and abandonment of oil, natural gas, and geothermal wells. DOGGR is a regulatory program that emphasizes the "wise development of oil, natural gas, and geothermal resources in the state through sound engineering practices that protect the environment, prevent pollution, and ensure public safety." All California oil and gas wells are permitted, drilled, operated, maintained, plugged and abandoned under requirements and procedures administered by DOGGR. Oil and gas pools receive Field Rules established by the State Oil and Gas Supervisor. Existing law requires an operator of a well to obtain approval from the State Oil and Gas Supervisor or district deputy before beginning the work of drilling a well. The establishments of procedures safeguards public safety and the environment.

Senate Bill 4 (Pavley) was approved in 2013 and is included in the California Public Resource Code Section 3015-3161. It requires DOGGR to exercise additional requirements over the existing laws that regulate drilling, operations, maintenance, and abandonment of oil and gas wells, tanks and facilities in order to increase transparency and accountability to the public regarding well stimulation treatments. The owner and or operator of a well is required to record and report all data on acid treatments and well stimulation treatments. In addition, an operator is required to apply for a permit before performing a well stimulation treatment. It prohibits the operator from either conducting a new stimulation treatment or repeating a well stimulation treatment without a valid, approved permit from the DOGGR.

State Division of Mines and Geology

In addition to the informal guidance provided by the above-referenced sections of SMARA, the State Division of Mines and Geology has prepared "Mineral Resource Management Goals and Policies" which, in accordance with the SMARA, provide additional guidance in the preparation of the County's Mineral Resource Management Program (MRMP). These goals and policies are achieved through a joint effort between the California Geological Survey, the State Mining and Geology Board, and local government (i.e., the City).

Local Policies and Regulations

Kings County Surface Mining and Restoration Ordinance (Chapter 17 of the Kings County Code of Ordinance)

Chapter 17: Surface Mining and Reclamation in the Kings County Code of Ordinances is intended to ensure the continued availability of important mineral resources by regulating surface mining operations as specified in SMARA. The purpose and intent of this chapter is to ensure that adverse environmental effects are prevented or minimized and that mined lands can be reclaimed for alternative land uses, to encourage the production and conservation of minerals, and to eliminate residual hazards to public health and safety (Municipal Code Corporation, 2016).

Kings County General Plan

The Kings County General Plan - Resource Conservation Element (Kings County, 2010i) contains polices requiring the protection of aggregate resources and the reclamation of mined areas. The General Plan contains the following polices that address mineral resources:

- *RC Goal G1:* Encourage the development of oil and gas energy sources provided that they do not degrade environmental quality.
- *RC Objective G1.*1: Ensure the restoration of oil and gas well sites to a pre-drilling condition after the completed use of a site.

- *RC Policy G1.1.1:* Require the timely reclamation of oil and gas development sites upon termination of such activities to facilitate the conversion of the land to its primary land use as designated by the General Plan. Reclamation costs shall borne by well operator.
- *RC Policy G1.*1.2: Additional restrictions in the General Agricultural areas of the County will not be imposed on oil and gas exploration as long as the oil companies involved continue to restore sites to their original condition after use.
- *RC Goal H1:* Support the extraction of mineral resources in a manner that will not degrade the environment or conflict with other land uses.
- *Objective H1.1:* Provide for the development of mining and mineral extraction.
- *RC Policy H1.1.1:* Implement the Surface Mining and Reclamation Act by requiring all mining operations, including surface mining, to secure a Conditional Use Permit, pursuant to the Kings County Zoning Ordinance, prior to beginning any mining operation.
- *RC Policy H1.1.2:* All surface mines, unless otherwise exempted, shall be subject to reclamation plans that meet the requirements of the Kings County Surface Mining and Reclamation Act Ordinance (Article 17 Kings County Code of Ordinance) and the State Surface Mining and Reclamation Act (SMARA) requirements. Reclamation procedures shall restore the site for future beneficial use of the land. Mine reclamation costs shall be borne by the mine operator, and guaranteed by financial assurances set aside for reclamation procedures.
- *RC Objective H1.*2: Ensure that mineral extraction operations are designed, located, and operated so that they do not harm humans or the natural environment or are incompatible with surrounding land uses.
- *RC Policy H1.*2.1: Discourage the location of mining operations near residential areas and other sensitive land uses, unless all impacts to such uses can be mitigated.
- *RC Policy H1.*2.2: Minimize the adverse effects on environmental resources such as water quality and quantity, air quality, drainage and flood control, geophysical characteristics, biological resources, and aesthetic factors.

3.13.3 Impact Analysis

Methodology for Analysis

Potential impacts on oil and mineral resources were analyzed based on the potential for the Project to affect the resources described above in *Section 3.13.1, Environmental Setting* during Project construction or operation.

Thresholds of Significance

For the purposes of this analysis, an impact to oil and mineral resources would be significant if the Project would:

- 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.
- 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.
- Substantially affect existing mineral resource recovery operations.

Impacts and Mitigation Measures

Impact OIL-1 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

Construction

Storage Facilities

There are several existing oil and gas fields within the vicinity of the Kettleman Reservoir, including the abandoned Kettleman City, Harvester, and Northwest Trico gas fields, and the Tulare Lake oil field, as shown in **Figure 3.13-4.** Construction of the Kettleman Reservoir would occur within the abandoned Kettleman City gas field and the abandoned Westlake Quarry. Construction of the Kettleman Reservoir would overlap with some portions of the abandoned Kettleman City gas field. In total, there are 17 wells at the Kettleman Reservoir site, 15 of which are plugged and abandoned, as shown in **Table 3.13-5.**

Table 3.13-5: Affected Wells within Kettleman Reservoir

Active	New	Plugged & Abandoned	Total
2	-	15	17

As previously described**,** there are two active wells located in the Kettleman Reservoir site (Zodiac #4-9 and #1-10 Exploratory Oil & Gas Well); these wells have been constructed or are in the process of being constructed. Zodiac Exploration Inc. (Zodiac) began leasing 85,000 acres of land in 2011 to begin exploring potential oil deposits in Kings County. Oil located there is in denser rock that cannot be accessed using traditional drilling methods, but horizontal drilling technologies or fracking could help access these deeper oil reserves (Nidever, 2011). Zodiac is the first company to tap this farmland for oil since the 1970s/80s (Nidever, 2011).

Construction in this area to develop the Project's storage reservoir would not impact the operation of existing oil wells. The two existing active wells would be protected from inundation or damage by the establishment of "islands" perimeter levees that would also serve to provide as access roads to the wells. Access to the oil wells would not be restricted during construction activities. By maintaining accessibility to these oil wells, the Project would not hinder the continuation of mining and mineral extraction during construction, as expressed in Objective *RC Goal G1: Encourage the development of oil and gas energy sources provided that they do not degrade environmental quality* in the Kings County General Plan (Kings County, 2010i). Additionally, to the extent that future oil and gas wells may be constructed within the property covered by Semitropic's easement, consistent with applicable surface and subsurface rights, the Project would reasonably accommodate access to the new well sites in areas on the easement property not occupied by Project facilities.

There are no active sand or gravel extraction sites or other surface mining sites in Kings County. However, there is an inactive aggregate mine site within the County (Hewitson Cattle Mine), located 15 miles southwest of the proposed Kettleman Reservoir site. The Hewitson Cattle Mine is considered "idle" at present, but has a permit and an Interim Management Plan, meaning mineral production could begin at any time. Since this mine is located a substantial distance from the Kettleman Reservoir, construction of the storage facilities would not result in the loss of availability of these mineral resources. Impacts to mining and mineral resources from construction of the Kettleman Reservoir are therefore considered to be less than significant.

Conveyance Facilities

There are no oil or natural gas fields or wells within the construction area of the proposed Aqueduct Intertie, nor near the South Fork Canal, Blakeley Canal, or Empire Weir No. 2. Construction of portions of the Kettleman Canal within the Kettleman Reservoir would require construction within an area that contains 17 active or abandoned oil wells, though the potential for impacts to registered wells is smaller as a smaller area is required for construction. Construction of the Project conveyance facilities would not result in the loss of availability of a known oil or gas resource; as such, impacts are considered less than significant.

Other Facilities

Construction of the maintenance yard, electrical switchyard and substation, and pumping plants would not result in the loss of availability of a known oil or gas resource as none exist within the proposed construction areas. The placement of construction staging areas would be such that there is no overlap with areas known to contain oil or gas resources and would not affect current mineral recovery operations in the area. Therefore, there would be no impacts from construction of these Project facilities.

Operations & Maintenance

Storage Facilities

The Project area is currently undeveloped and is not used for extraction of any mineral resources. Additionally, the area is not delineated as a locally important mineral resource zone by the California Geological Survey or any county or city land use plan, nor is it located within an area identified by the California Department of Mines and Geology as having substantial mineral resources. Similarly, the Kings County General Plan notes the low potential for surface mining in the county and does not designate any areas as important aggregate or other mineral recovery sites (Kings County, 2010i). The Resource Conservation Element of the Kings County General Plan recognizes that oil and gas recovery activity in the area has diminished, and does not designate any areas of the county for future oil and gas recovery.

As mentioned above in the environmental setting, oil and gas production within the County has been in decline for several decades. With the exception of the newfound interest in exploring and potentially extracting remaining oil reserves in the area, other mining and drilling operations have been out of commission for several decades.

There are 17 wells (two active and 15 plugged and abandoned) located in the proposed Kettleman Reservoir site that would potentially be affected by the operation of the Kettleman Reservoir. Except for the two active wells, all oil and gas wells in the storage facility area (save 2 unplugged abandoned wells) are plugged, abandoned, and buried and would not be affected by the operation of the storage facilities.

The two active wells in the proposed Kettleman Reservoir site (Zodiac #4-9 and #1-10 Exploratory Oil & Gas Well) would not be affected by the operation of the storage facilities, even when the reservoir is in operation (anticipated to be every three out of ten years). The two active wells would be protected from inundation during storage years using perimeter levees. These levees would serve both as a protective barrier to the wells and as access roads to the wells. Perimeter levees would ensure operation of the wells can continue, even when the reservoir is being filled. Potential oil spills from the wells are addressed in *Chapter 3.10 Hydrology and Water Quality.*

In addition, construction and operation of the Project would not impede the potential to develop additional wells in the Project area, although developers would need to accommodate for existing Project facilities at that time. If new wells were to be installed within the proposed reservoir, the perimeter levees would be constructed around the well site to protect the well when the reservoir is inundated. New wells would be accessed and serviced using access roads on top of the Kettleman Reservoir levees through Quebec Avenue and Racine Avenue, in a manner similar to the existing active wells. This design would ensure the reservoir operations would not prevent the recovery of oil resources and would not conflict with the Kings County

General Plan Objective H1.1., which states: "provide for the development of mining and mineral extraction*"* (Kings County, 2010h). Impacts resulting from Project operations are therefore considered less than significant.

Conveyance Facilities

In addition, construction and operation of the Project would not unreasonably impede the potential to develop additional wells in the Project area, although developers would need to accommodate for existing Project facilities at that time. To the extent that future oil and gas wells may be constructed within the property covered by Semitropic's easement, consistent with applicable surface and subsurface rights, the Project would reasonably accommodate access to the new well sites in areas on the easement property not occupied by Project facilities. The Project would not prevent or unreasonably interfere with the recovery of oil resources and would not conflict with the Kings County General Plan Objective H1.1., which states: "provide for the development of mining and mineral extraction*"* (Kings County, 2010h). Impacts resulting from Project operations are, therefore, considered less than significant.

Other Facilities

Operation and maintenance of other Project facilities, including the maintenance yard, electrical switchyard and substation, and pumping plants, would not result in the loss of a known mineral resource in the region. There are no oil or gas resources or active surface mining or extraction sites that would be affected by the operation of these facilities. Therefore, there would be no impact, as the operation of the Project's other facilities would not result in the loss of availability of a known oil or gas resource.

Significance Determination before Mitigation

Less than Significant.

Significance Determination after Mitigation

No mitigation measures are required.

Impact OIL-2 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?

Construction

All Facilities

Mineral resources are addressed in the Resource Conservation Element of the 2035 Kings County General Plan. The General Plan recognizes that oil and natural gas production in the County has diminished and does not designate any areas of the County for oil and gas recovery. As stated in the Kings County General Plan, oil and gas exploration and production is permitted at lands designated General Agriculture, 40-acre, such as the Project area (Kings County, 2010h). The Kings County General Plan Land Use and Resource Conservation Element states that petroleum exploration, extraction and production activities, mineral and petroleum, petroleum fields and mineral deposits of regional and statewide significance are "compatible" uses with agricultural designations (Kings County, 2010i). The General Plan notes the low potential for surface mining in the County and does not designate any areas of the County as important aggregate or other mineral recovery sites (Kings County, 2010i). Therefore, the Project would have no impact with respect to loss of availability of important mineral recovery sites designated on local land use plans.

Operations & Maintenance

All Project Facilities

Neither the Kings County General Plan or the local Kettleman City General Plan designate areas for oil or gas recovery. Additionally, the Kings County General Plan notes the low potential for surface mining in the County and does not designate any areas of the County as important aggregate or other mineral recovery

sites (Kings County, 2010i). The operation and maintenance of Project would not occur on land delineated as a locally-important resource recovery site by any local or regional plan and, therefore, there are no impacts.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact OIL-3 Substantially affect Existing Mineral Resource Recovery Operations

Construction

Storage Facilities

Construction of the proposed Kettleman Reservoir could potentially limit exploration for new mineral resources within the abandoned Kettleman City oil field. This disruption would be temporary, lasting only until construction is complete. Furthermore, mineral exploration is not a priority for the County, and the County does not designate any of the Project area as land to be used for resource recovery. Although there are two oil wells listed as "active" within the Kettleman Reservoir area, they are not currently in operation and are unlikely to be so during construction. If wells are in operation during construction activities, their direct operations would be unaffected and access to these wells would not be lost.

Aside from the two active oil wells, there is also an inactive aggregate mine site within the County, (Hewitson Cattle Mine) located 15 miles southwest of the of the Kettleman Reservoir. The Hewitson Cattle Mine is considered "idle" at present, but has a permit and an Interim Management Plan, meaning mineral production could begin at any time. Since this mine is located a substantial distance from the Project, construction of the Kettleman Reservoir would not impact potential ongoing aggregate recovery operations ongoing at the Hewitson Cattle Mine. As such, there are no associated impacts.

Conveyance Facilities

The area in and around the existing and proposed conveyance facilities for the Project is not currently used for the extraction of any mineral resources. Additionally, the California Division of Mines and Geology has not identified any significant mineral resources within the County (DOGGR, 2013). Portions of the Kettleman Canal (mainly, those lengths located within the Kettleman Reservoir) would be constructed near mostly plugged and abandoned oil wells. The two active oil wells are not of concern to the construction of the internal reservoir channel and the wells would be taken into consideration as part of the canal design. Any potentially associated impacts are similar to those discussed above for the proposed reservoir site. Overall, construction of new conveyance facilities and improvements to existing facilities would not result in the loss of availability of a known oil or gas resource. Accordingly, there are no associated impacts.

Other Facilities

There are no active mineral resource recovery operations near the Project's other facilities (pumping plants, electrical switchyard and substation, and maintenance yard); therefore, construction of these facilities would have no impact on resource recovery operations.

Operations & Maintenance

Storage Facilities

Operation and maintenance of the proposed Kettleman Reservoir would not impede upon existing ongoing mineral resource recovery operations. The two active wells in proposed Kettleman Reservoir site (Zodiac #4-9 and #1-10 Exploratory Oil & Gas Well) would not be affected by the operation of the storage facilities, even when the reservoir was full (anticipated to be every three out of ten years). The two active wells would

be protected from inundation during storage years using perimeter levees, with these levees serving both as a protective barrier for the wells and as access roads to the wells. In addition, if consistent with applicable surface and subsurface rights, future resource recovery operations that do not interfere with Project facilities could be constructed on the easement property and operated in a manner similar to the two existing wells. While there is low potential for ongoing mineral resource recovery in the County and the Project area, the Project would reasonably accommodate for such development and would not unreasonably hinder or result in the loss of availability of a mineral resource. As such, there would be no impacts associated with Project operations.

Conveyance Facilities

Once in operation, the conveyance facilities would have no effect on existing mineral resource operations as none exist within the area of most of these facilities. The Kettleman Canal would not impact oil and natural gas wells in the area because identified wells are mostly are plugged or abandoned and any unplugged wells would likely be discovered during Project construction. Therefore, the O&M of the Project's conveyance facilities would not substantially effect ongoing mineral resource recovery operations and there would be no associated impacts.

Other Facilities

No mineral resource recovery sites are delineated in the County's General Plan, which covers the Project area. O&M of the pumping plants, electrical switchyard and substation, and maintenance yard would not interfere with any existing mineral resource recovery operations (as none exist in the Project area). As such, there would be no impacts associated with the operation of these facilities.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Cumulative Impact

The geographic scope of potential cumulative impacts related to oil and mineral resources encompasses the Project and immediate vicinity. There are six relevant projects within the immediate vicinity of the proposed Project that may contribute to cumulative impacts, including:

- Quay Valley Community Development - a new 7,175-acre community to be developed in south Kings County.
- Kettleman Hills Facility Expansion - expanding the existing B-18 Landfill and construct a new B-20 Landfill for hazardous waste and designated waste disposal.
- Kettleman City Surface Water Treatment Plant and Commercial Water Storage Tanks (Treatment Plant) – construction of a new surface water treatment plant to treat surface water for potable supply.
- Southwest Groundwater Banking Project – development of a project to divert and store floodwater from the Kings River and local stormwater.
- JID Distributed Recharge Bypass and Lassen Projects – improvement to and construction of recharge facilities to divert and store floodwater from the Kings River.
- Terranova On-Farm Flood Capture and McMullin Recharge Site – improvements to and construction of facilities to divert floodwater from the Kings River for recharge on existing farm lands.

Other than potentially overlie unidentified mineral resources, there are no cumulative projects impacts that would negatively impact oil and mineral resources in Kings County or the Project area. As mentioned above, the proposed Project is within the vicinity of potential future drilling/fracking activities and the other related projects may also be the same. However, because of the accommodating design of the Project, there are no anticipated impacts from the construction and operation of the proposed Project. Similarly, related projects in the area are not anticipated to impact ongoing or potential mineral resources in the Project area. CEQA documentation for the other related projects, including the expansion of the Kettleman Hills Facility, construction of the Kettleman City Water Treatment Plant, and the Southwest Groundwater Banking Project, have found no impacts related to mineral and oil resources. Quay Valley plans to reserve 140 gross acres for Mineral Resource Preserves, which would host Mineral Operating Areas to produce oil and gas and would serve as a beneficial impact to the area by preserving mineral resources (Kings County, 2016e). The Mitigated Negative Declaration for the Surface Water Treatment Plant concluded the project would have no impact to mineral resources since no land in Kings County is classified as a Mineral Resource Zone by the California Geological Survey, Division of Mines and Geology or delineated on a land use plan as an important mineral resource recovery site. Therefore, since no known mineral resources exist at the proposed treatment plant site, the project would not result in the loss of availability of a known mineral resource (Kings County, 2011). Similarly, the proposed area for expansion of the Kettleman Hills Facility (B-18/B-20 Hazardous Waste Landfill) and Southwest Groundwater Banking Project are not known to contain mineral resources, and therefore would not result in the loss of availability of a known mineral resource. Land use is not expected to change or phased due to implementation of either project, and no mineral resource recovery would be impacted (DTSC, 2013; Provost and Pritchard, 2013).

Impacts above determine that the only project with the potential to negatively impact oil and mineral resources in the area is the Quay Valley Community Development project, and this project is proposing a mitigation measure to address those impacts. The other related projects have no impacts due to a lack of mineral resources in the area. Additionally, since Kings County has not been a leading producer of aggregate minerals, the loss of these resources would not extend beyond the Project area or other regions, because other areas are not dependent on these resources. The loss of existing or potential future mineral resources due to cumulative development is not considered significant.

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3.14 Population and Housing

This section describes the population and housing characteristics in the area of the proposed Project, evaluates the potential for the proposed Project to impact population and housing, and provides mitigation measures to reduce impacts.

3.14.1 Environmental Setting

Semitropic operates and has access to groundwater banks and other water storage facilities in Kern County (see Figure 2-2 in *Chapter 2 Project Description*) and provides water to agricultural users within its boundaries. The proposed Project facilities, as described in *Chapter 2 Project Description*, would be located entirely within Kings County, to the north of the groundwater banks, but water diverted, stored and conveyed as part of the Project would ultimately be transported, as capacity is available, into the California Aqueduct principally for delivery to Semitropic to meet water needs of existing irrigated lands within its boundaries. Water diverted from the Aqueduct would be delivered to meet direct demands or stored underground by use of groundwater storage facilities and, to a lesser extent, surface storage facilities accessible from the Aqueduct, including in-lieu and direct recharge facilities of Semitropic in Kern County. Stored (banked) water would be recovered through extraction and/or by way of exchange, and delivered to primarily meet the demands of existing irrigated lands in Kern County and Kings County.

The Project's operation would be in accordance with existing banking program agreements, including environmental documentation and mitigation measures, and consistent with previously-approved operational parameters and commitments. Because the population and housing impacts the would result from operation of the existing banking programs, including within Semitropic, have been evaluated in environmental documentation previously prepared in support of the groundwater banking operations, only facilities in the area of the proposed Project have been analyzed in this section.

Kings County

According to the Housing Element of the Kings County General Plan, population growth in the County has been significant in the last few decades. The County's non-institutional population grew from 89,469 in 1990 to 132,184 in 2009, increasing by almost 50 percent (Kings County, 2010c). The non-institutional, unincorporated population increased by approximately 4 percent, from 32,122 to 33,354, during this time (Kings County, 2010c). As such, cities within the County have received most of the growth, including the cities of Avenal, Corcoran, Hanford, and Lemoore. The California Department of Finance (DOF) projects that the Kings County's population will increase by another 60 percent over 2009 levels, to 250,000 by the year 2030.

The institutional population in Kings County includes persons in group quarters, primarily in the state prisons at Avenal and Corcoran, which comprised 15 percent of the County's population in 2009 (Kings County, 2010c). This group has been the main contributor to population growth in the previous decades, but that is not expected to be the case in the future. Persons living in group quarters are not counted as households in the Kings County Census. In 2010, the total number of households in the County was 34,418, with approximately 80 percent of households comprised of families (USCB, 2015b). The average size of all County households is 3.18 persons per household (Kings County, 2010c).

3.14.2 Regulatory Framework

This section describes laws and regulations that may apply to the proposed Project. There are no federal or state regulations associated with population and housing that are relevant to the proposed Project.

Local Policies and Regulations

Kings County General Plan Housing Element

Kings County has identified the following relevant goal and program in the Housing Element of its General Plan (2010):

GOAL 2. Facilitate and encourage the provision of a range of housing types and prices to meet the diverse needs of residents.

> *Policy 2.1. Provide adequate sites for housing through appropriate land use, zoning and development standards to accommodate the regional housing needs for the 2009–2014 planning period.*
>
> *Policy 2.2. Work collaboratively with nonprofit and for-profit developers to seek state and federal grants to support the production of affordable housing.*
>
> *Policy 2.3. Ensure the adequate provision of water, sewer, roads, public facilities, and other infrastructure necessary to serve new housing.*
>
> *Policy 2.4. Support the construction of high quality single- and multi-family housing which is well designed and energy efficient.*

The proposed Project would neither create nor remove housing within Kings County, and would not attribute to population growth in the Project area.

3.14.3 Impact Analysis

Methodology for Analysis

This section evaluates whether construction and O&M of the facilities associated with the proposed Project would result in significant impacts related to population and housing.

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines,* an impact on population and housing would be considered significant if the project would:

- Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?
- Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?
- Displace substantial numbers of people necessitating the construction of replacement housing elsewhere?

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to activities associated with the proposed Project are identified below along with a supporting rationale as to why further consideration is unnecessary and a no impact determination is appropriate.

- *Displace substantial numbers of housing units* – The proposed Project would be confined to agricultural lands in Kings County and would not require the demolition of existing residential houses. As a result, the proposed Project would not displace existing housing.

- *Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere* – The proposed Project's construction activities would be confined to agricultural lands in Kings County and would not remove any housing. As a result, the proposed Project would not displace people nor necessitate the construction of replacement housing.

Impacts and Mitigation Measures

Impact POP-1 Induce Population Growth in Area

Construction

All Facilities

On average, construction activities for all facilities in Kings County would result in a maximum of approximately 160 workers on the Project site at any one time. Workers would commute to the Project area over an estimated 32-month construction period, either from locations within the immediate area or in the surrounding communities. It is expected that few, if any, construction employees would relocate to the Project area. Therefore, construction activities associated with the proposed Project would not directly or indirectly induce the development of new housing or businesses. Construction impacts associated with the proposed Project would be less than significant.

Operations & Maintenance

All Facilities

Direct Impacts

The proposed Project would include the construction of additional water conveyance and storage facilities in Kings County. O&M of the proposed Project facilities would be performed by existing Semitropic staff, which would not result in a need for new homes or businesses. Therefore, direct impacts would be less than significant, and mitigation would not be required.

Indirect Impacts

The Project has been proposed in response to restricted SWP deliveries in recent years and other drought-related effects. One of the key Project objectives is to increase local and regional water supply reliability of previously-existing water supply allocations. Particularly, water from the Project would primarily be stored underground and/or distributed to local agricultural users to irrigate existing developed agricultural lands in Semitropic, and to a lesser extent, lands in Dudley Ridge in Kings County and areas of Kern County outside of Semitropic's boundaries. The Project would manage floodwaters for future use on a seasonal basis and serve as a supplemental source of water; as such, it is not anticipated to indirectly induce population or housing growth. As a result, it is not likely that the proposed Project would induce substantial population growth, and the indirect population impacts of the proposed Project are expected to be less than significant.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Cumulative Impacts

The study area for the cumulative impacts analysis includes the proposed Project and related projects as previously described in *Section 3.1.3 Other Related Projects*. Similar to the proposed Project, each of the following projects would be subject to applicable regional and local land use plans and policies.

- Quay Valley Community Development - a new 7,175-acre community to be developed in south Kings County.
- Kettleman Hills Facility Expansion - expanding the existing B-18 Landfill and construct a new B-20 Landfill for hazardous waste and designated waste disposal.
- Kettleman City Surface Water Treatment Plant and Commercial Water Storage Tanks (Treatment Plant) – construction of a new surface water treatment plant to treat surface water for potable supply.
- Southwest Groundwater Banking Project – development of a project to divert and store floodwater from the Kings River and local stormwater.
- JID Distributed Recharge Bypass and Lassen Projects – improvement to and construction of recharge facilities to divert and store floodwater from the Kings River.
- Terranova On-Farm Flood Capture and McMullin Recharge Site – improvements to and construction of facilities to divert floodwater from the Kings River for recharge on existing farm lands.

The Quay Valley community project would accommodate 80,000 to 85,000 permanent residents, resulting in significant population and housing impacts. The other projects listed above could also potentially indirectly induce growth in the region by providing additional resources in existing region or by creating new jobs. These projects include the expansion of an existing landfill facility and construction of a new surface water treatment plant in Kettleman City, as well as the construction of another groundwater banking project approximately 40 miles north of the Project area. However, as described above, the proposed Project itself would not result in increases in population, either as a result of natural increases in the existing population or the in-migration of new residents; therefore, the proposed Project's incremental housing and population effects would not be cumulatively considerable.

3.15 Public Services

This section presents the physical and regulatory setting for public services at the Project site. The impact analysis considers the potential for the Project to exceed the existing capacity for public services (i.e., police, fire, schools, and parks).

3.15.1 Environmental Setting

The Project area for the analysis of public services is Kings County and Kettleman City, which provide public services in the general area in which the Project would be constructed. The following sections describe the environmental setting for public services within the Project area.

Police Services

Police services are provided in the Project area by the Kings County Sherriff's Department (KCSD). KCSD provides enforcement services to all unincorporated areas of the County. Generally, there are 11 deputies on duty at all times throughout the County when the sheriff's department is fully staffed (Kings County, 2009). KCSD currently consists of 32 deputies and with several specialty units, including the Boating Enforcement Unit, K-9 Unit, Dive Team, the Off-Highway Enforcement Team, Rural Crime Task Force (or "Ag Unit"), and SWAT (Kings County, 2016a). The primary law enforcement concerns within this area are agricultural crimes.

KCSD headquarters are located at 1444 W. Lacey Boulevard in Hanford, California. In addition, there are five substations located throughout the County: Avenal, Corcoran, El Rancho, Kettleman City, and Stratford (the nearest to the Project area are the Kettleman City and Stratford substations). The Kettleman City substation assigns service to Kettleman City, the area south to the Kern County line, and along Interstate 5, and would be expected to service all Project facilities except for the Empire Weir No. 2, the South Fork Canal, and the northern portion of the Blakely Canal. These facilities are expected to be serviced by the nearby Stratford satellite substation (located approximately one mile north) or the County Sheriff's Department, located in Hanford, approximately 16 miles north of the facilities.

The California Highway Patrol (CHP) provides additional traffic enforcement along state highways and county roadways, as well as all dedicated roads in the unincorporated area. Kings County is within the CHP's Central Division which encompasses the heart of the San Joaquin Valley. The County's CHP area office is located at 1565 Glendale Avenue in Hanford, California. In addition to issuing traffic citations for traffic violations, CHP provides other services to support the overall safety of residents in the County. The Central Division implements the Skywatch program in an effort to reduce accidents involving commercial vehicles. The program uses fixed wing aircraft, RADAR, and LIDAR to police commercial vehicles and passenger vehicles operating unsafely on State Route 99 and Interstate 5.

Fire Protection

Fire protection services within the Project area are provided by the Kings County Fire Department (KCFD) and associated county facilities. The KCFD maintains a mutual aid agreement with the City of Hanford Fire Department and other outside agency fire departments. Additional agency fire departments include the City of Lemoore Volunteer Fire Department and the Naval Air Station Lemoore Fire Department. In addition to fire suppression and emergency medical services (EMS), KCFD responds to traffic accidents on the Interstate 5 corridor throughout Kings County, as well as providing mutual aid to Kern and Fresno Counties. KCFD responds to over 4,700 calls annually (an average of 13 per day) which include emergencies such as structure, vehicle, wild land and grass fires, medical aids, traffic accidents, hazardous materials incidents, and various assistance calls (Kings County, 2016b). KCFD headquarters is located at 280 N Campus Drive in Hanford, California.

KCFD operates from ten fire stations located throughout the County, employing 60 professional firefighters, one Fire Equipment Specialist, five Battalion Chiefs, one County Fire Chief, and one Administrative Assistant/Office of Emergency Services (OES) Coordinator, one Assistant Chief, one Fire Chief, and two office assistants (Kings County, 2016b). Assistance is received from ten Volunteer Companies within the County consisting of approximately 20 active volunteer firefighters. KCFD's fleet includes one 1996 Navistar Engine, one 1986 FMC Engine, one 1999 3D Ford F-450, one 1974 Mack Water Tender, and a 1984 Chevy Squad (Kings County, 2009). There are two firefighters on duty at all times (Kings County, 2009). Service areas within five miles of a fire station, including unincorporated county territory, are generally served within the standard response time (within five minutes) (Kings County, 2009). Fire Station No. 9 (Kettleman City Fire Station), located at 85 Brown Street, is situated approximately one mile from the Kettleman Reservoir, and thus would serve the Project within KCFD's standard response time for fire suppression and EMS. The Fire Department "considers any development outside the five-mile response zone to be an impact to fire protection services" (Kings County, 2009).

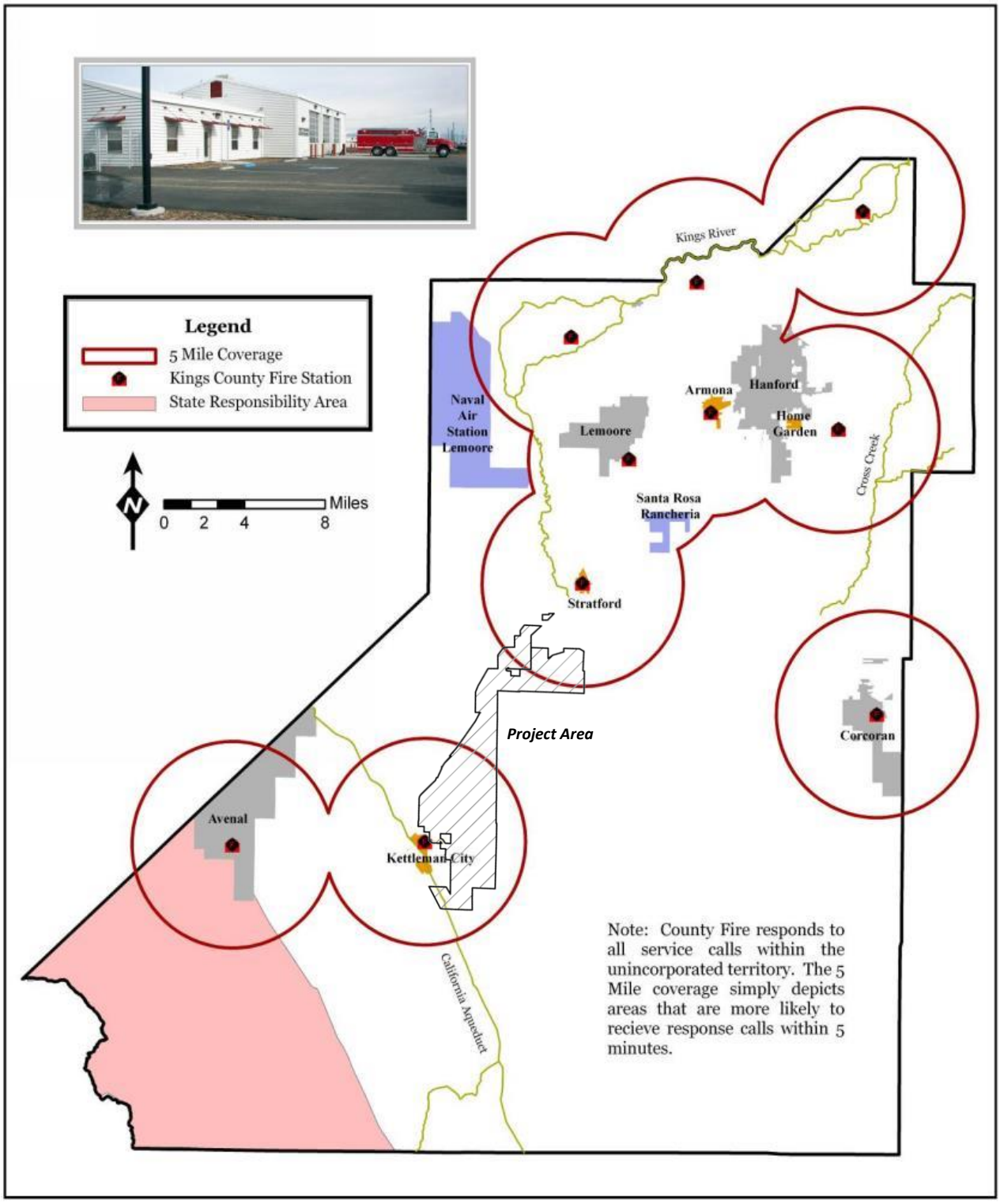
Fire Station No. 10 (Stratford Fire Station), located at 20200 Main Street in Stratford, is situated approximately one mile from Empire Weir No. 2, the South Fork Canal, and the northern portion of the Blakely Canal. Fire Station No. 10 would serve the northern portions of the Project, which is within their range to be serviced in under 20 minutes (Kings County, 2010j). The Stratford Fire Station is staffed by one captain, one engineer, and ten volunteer firefighters, with one firefighter being on duty at all times (Kings County, 2009). Equipment includes a patrol unit, pumper engine and a pumper truck reserve unit (Kings County, 2009).

The KCFD also includes the Fire Department's Search and Rescue Helicopter, provided by Skylife Air Medical Service, and is based at the Fresno Air Terminal. The County also has a Bell 212 Helicopter stationed at the Kings County Fire Station No.4 Heliport, which also serves as the County's local staging area for SkyLife emergency medical helicopter transport (Kings County, 2009). The Search and Rescue Helicopter is available for use within the County.

The California Department of Forestry (CDF) also responds to incidents in the State Responsibility Area that is southwest of State Route 33. There are no CDF Stations in Kings County; the nearest responding stations are located in Fresno County and San Luis Obispo County.

Figure 3.15-1 shows the location of emergency services relative to Project components.

Figure 3.15-1: Map of Emergency Services within Project Area



Source: Kings County General Plan, Health and Safety Element, 2009.

Other Emergency Services

The Kings County's Office of Emergency Management (OEM) is tasked with coordinating multi-agency responses to complex, large-scale emergencies and disasters within Kings County (Kings County, 2016c). The OEM develops and maintains the Emergency Operations Plan (EOP), which serves as a guideline for recommending optimal EMS dispatch and first response configurations for Kings County, evaluating the need for policy development, recommending optimal ambulance swerve areas, recommending guidelines for an EMS disaster plan, and evaluating EMS education plans. OEM provides dedicated staff responsible for managing the County Emergency Operation Center (EOC) and developing and implementing training and exercise programs designed to coincide with the processes and procedures within EOP.

Public Schools

There are 15 school districts and 64 individual schools located throughout Kings County (Ed-Data, 2016). These districts and schools vary in size and the number of students served. County-wide enrollment for the 2014/2015 school year totaled 28,653 students (Ed-Data, 2016). Schools are expanded on an as-needed basis, and capacity is not closely monitored unless indicators of overcrowding are present. There are no schools within a half mile of Project site.

3.15.2 Regulatory Framework

Federal Policies and Regulations

National Fire Protection Association (NFPA) 1710 Standards

The NFPA 1710 Standards outline the minimum requirements relating to the organization and deployment of fire suppression operations, emergency medical operations, and special operations to the public by all career fire departments. The requirements address functions and objectives of fire department emergency service delivery, response capabilities, and resources. The 1710 Standards specify that each fire apparatus be staffed with four firefighters, and that response times be no more than four minutes after leaving the firehouse for the first arriving company and/or eight minutes for a full first alarm response; and four minutes for first responder capability to arrive at an emergency medical incident, with advanced life support capability arriving within eight minutes. This standard also contains general requirements for managing resources and systems, such as health and safety, incident management, training, communications, and pre-incident planning.

Uniform Crime Reporting Program (UCR)

The Federal Bureau of Investigation currently collects information on over 14,000 law enforcement agencies across the nation through the UCR. The UCR defines law enforcement officers as individuals who ordinarily carry a firearm and a badge, have full arrest powers, and are paid from governmental funds set aside specifically for sworn law enforcement representatives. While the UCR records number of law enforcement officers per 1,000 inhabitants, there are currently neither national requirements nor recommendations for staffing level ratios. The national average of sworn officers per 1,000 inhabitants was 2.4 in 2011, with the highest in cities with fewer than 10,000 residents.

State Policies and Regulations

California Fire Code

The California Fire Code, Article 79, includes specific requirements for the safe storage and handling of flammable and combustible liquids. Specific requirements address fire protection; prevention and assessment of unauthorized discharges; labeling and signage; protection from sources of ignition; specifications for piping, valving, and fittings; maintenance of above ground tanks; requirements for storage

vessels, vaults, and overfill protection; and requirements for dispensing, using, mixing, and handling of flammable and combustible liquids.

California Government Code Section 65995—School Facilities Legislation

The School Facilities Legislation was enacted to generate revenue for school districts for capital acquisitions and improvements. As of May 2016, this legislation allows a maximum one-time fee of $3.48 per square foot of residential development and $0.56 per square foot of commercial development. This fee is divided between the primary and secondary schools and is termed a "Level One" fee.

California State Assembly Bill 2926 —School Facilities Act of 1986

In 1986, AB 2926 was enacted by the state of California authorizing entities to levy Statutory Fees on new residential and commercial/industrial development in order to pay for school facilities. AB 2926, entitled the "School Facilities Act of 1986," was expanded and revised in 1987 through the passage of AB 1600, which created Section 66000 et seq. of the Government Code. Under this statute, payment of such Statutory Fees by developers would serve as total mitigation in accordance with CEQA to satisfy the impact of development on school facilities.

Local Policies and Regulations

Kings County General Plan

The Kings County General Plan guides development for the County with a 20-year planning horizon. The following policies in the Kings County General Plan, Health and Safety Element (Kings County, 2010b) would apply to the project:

- *HS Goal A1*: Preventative measures reduce the potential impacts of natural hazards upon people's lives, property, and the environment.
- *HS Goal C1*: Ensure the protection and well-being of residents, visitors and businesses that enables long term sustainability for future generations.
- *HS Goal C2*: Support County-wide safety through adequate law enforcement, quality fire protection, emergency preparedness, and accessibility in times of emergency.
- *HS Objective C2.1*: Provide sufficient law enforcement presence within each community district and other unincorporated areas of the County to protect residents, businesses, and visitors from personal and property crimes.
- *HS Policy C2*.1.2: Promote community safety by ensuring communities have sufficient sheriff coverage to provide 20 minutes or faster response times to priority emergency calls.
- *HS Objective C2.2:* Provide quality fire protection services throughout the County by the Kings County Fire Department, and Fire safety preventative measures to prevent unnecessary exposure of people and property to fire hazards in both County Local Responsibility Areas and State Responsibility Area.
- *HS Policy C2.2.4:* Review development proposals according to California Department of Forestry and Fire Protection "Fire Hazard Severity Zone Maps" to determine whether a site is located within a Very High Fire Hazard Severity Zone and subject to Wildland-Urban Interface Fire Area Building Standards and defensible space requirements as adopted under Senate Bill 1595 and effective January 1, 2009.
- *HS Objective C3.3:* Maintain sufficient operational area clearance for the Kings County Fire Department Heliport that serves Kings County Fire Department Search and Rescue helicopter and

contracted helicopter ambulance services which are critical to emergency response and safety of people within the region.

- *HS Policy C3.3.1:* Critically review new development proposals within a quarter mile of the Kings County Fire Department heliport to ensure compatibility of structures and uses with the operation of helicopters at County Fire Station No. 4.

Kettleman City Community Plan

The Kettleman City Community Plan guides development for Kettleman City with a 20-year planning horizon. The following policies in the Kettleman City Community Plan (KCCP), Community Health and Safety Element would apply to the project (Kings County, 2010d):

- *KCCP Objective 7A.1:* Provide sufficient law enforcement to protect residents from personal and property crimes.
- *KCCP Policy 7A.1.1:* Promote community safety by providing sufficient sheriff patrol coverage to provide 20 minute or faster response time to priority emergency calls.
- *KCCP Policy 7A.1.2:* New development should be evaluated for the extent of impact it may have in relation to the adequacy of the Sheriff's Department to provide adequate patrols necessary to cover the additional population.
- *KCCP Policy 7A.1.5:* Ensure traffic enforcement is adequately provided along State Highway 41 by the California Highway Patrol.
- *KCCP Policy 7B.1.3:* New structures shall not exceed two stories in height unless adequate fire equipment is provided that can reach beyond two stories or other alternatives are found acceptable to the Kings County Fire Department.
- *KCCP Policy 7B.2.1:* Emergency medical services such as Ambulance should be considered for placement in the community once the population reaches 6,400.

Stratford Community Plan

The City of Stratford Community Plan guides development for Stratford with a 20-year planning horizon. The following policies in the Stratford Community Plan, Community Health and Safety Element would apply to the project (Kings County, 2010j):

- *SCP Objective 7A.1:* Provide sufficient law enforcement to protect residents from personal property crimes.
- *SCP Policy 7A.1.1:* Promote community safety by providing sufficient sheriff patrol coverage to provide 20 minute or faster response time to priority emergency calls.
- *SCP Policy 7A.1.2:* New development should be evaluated for the extent of impact it may have in relation to the adequacy of the Sheriff's Department to provide adequate patrols necessary to cover the additional population.
- *SCP Policy 7A.1.3:* The Sheriff's Department should encourage Deputies assigned to Stratford to participate in the community's functions, and actively promote safety by implementing community safety programs.
- *SCP Goal 7B:* Continue to provide quality service for fire protection and emergency medical response in the community.

3.15.3 Impact Analysis

Methodology for Analysis

Potential impacts on utilities are analyzed based on the potential for the Project to affect the facilities described above in *Section 3.15.1, Environmental Setting* during construction or operation.

Thresholds of Significance

For the purposes of this analysis, an impact to public services would be significant if the Project would:

- 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:
    - Fire Protection
    - Police Protection
    - Schools
    - Parks
    - Other public facilities

Impacts and Mitigation Measures

Impact PUB-1 Substantial Adverse Physical Impacts Associated With the Provision of New or Physically Altered Governmental Facilities or Need for New or Physically Altered Governmental Facilities

Construction

During construction, accidents could occur in the work area. These accidents would temporarily increase demand for emergency services, which would occur on an as-needed and emergency basis. This short-term increase could be accommodated by the service providers in the Project area. The Project would not require any new or physically altered governmental facilities in order to maintain acceptable service ratios, response times, or other performance objectives for police or fire protection. Neither expansion of facilities nor increase in employees is expected to require new or expanded police or fire facilities.

Construction of the Project would temporarily affect traffic flow on segments of the roadway network in the Project area by increasing traffic volumes on roads that provide access to the site. Construction would generate vehicle trips for deliveries of equipment and material. Workers would be expected to commute via car from their homes to the work areas. This could result in impacts to traffic and circulation along roadways used by public services (such as police and emergency responders). Truck traffic for equipment and material deliveries would access Interstate 5, State Highway 41, Quebec Avenue, and Racine Avenue in the Project area. As described in *Chapter 3.17 Transportation,* construction-related traffic could temporarily reduce the capacities of Project area streets because of the slower movements and larger turning radii of construction trucks as compared to passenger vehicles, especially during peak commute hours (7:00 AM to 9:00 AM, and 4:00 PM to 6:00 PM), which could result in worse levels of service and higher delays at local intersections than during off-peak hours. Public emergency services would have access to the construction area and would not be prevented from utilizing the same access roads. The additional traffic and interaction with other vehicles on the roads may potentially increase risk of accidents, which could constrain public service agency response times. The traffic management plan (**Mitigation Measure TRA-1**), discussed in *Section 3.17 Transportation,* would address and reduce these risks through coordination of Project construction and operations with the appropriate transportation entities in the region.

In order to reduce potential impacts to public security services (such as police), **Mitigation Measure TRA-1,** as described in *Section 3.17 Transportation*, would require staging areas to have site security and fencing and control construction easements using cones, signage and other similar methods to lessen any confusion on fire or police routes. Project staging areas and construction easements would be confined to the Project footprint to the extent feasible. Additionally, standard construction best management practices would be followed during construction, requiring equipment be equipped with spark arrestors. With these controls, potential impacts associated with police and fire protection services would be less than significant.

Project construction would not require additional public services, nor create a disruption in current public services, since the Project would not generate additional population growth. Therefore, impacts from construction of this Project are considered less than significant.

Storage Facilities

Construction of the Kettleman Reservoir would require site preparation, grading, excavation, and construction of levees. As mentioned above, construction would increase the possibility for accidents to occur on the Project site and could temporarily affect traffic flow of county and state highways. However, the Kettleman Reservoir is located within the five-mile response radius of the Kettleman City fire department and police substation, and services to this area are within the five-minute response time specified in the Kings County General Plan (Kings County, 2010e). The Kettleman Reservoir is also close enough to be serviced by police and fire departments within 20 minutes, which is the response time goal for the Kettleman City and Stratford emergency response teams specified in KCCP Policy 7A.1.1 and SCP Policy 7A.1.1 (Kings County, 2010d; 2010j). Since facilities are within appropriate service response time radii of public service agencies, the Project would not hinder these agencies from maintaining appropriate response times.

Even with the temporary addition of construction workers at the Project site, public services and associated service ratios in the area would not be negatively impacted; therefore, impacts to public services would be less than significant.

Conveyance Facilities

The Project includes construction of a new Kettleman Canal, two external pumping plants (Kettleman Pumping Plants #1 and #2), and Aqueduct Intertie facilities (including up to three parallel pipelines and turn-in/turn-out structures), along with improvements to Empire Weir No. 2 and the South Fork Canal. Facilities associated with the Aqueduct Intertie and southern portion of the Kettleman Canal (including Kettleman Pumping Plant #1) are within the range of the five-mile response radius of the Kettleman City substation and would be serviced by this substation if accidents were to occur. Similar to the storage facilities, construction of the conveyance facilities would temporarily increase population in the area for the construction period, but would not increase population enough to degrade service ratios in the area.

If needed, responses to incidents occurring at the Empire Weir No. 2, the South Fork Canal, the northern portion of the Blakeley Canal, Kettleman Weir and diversion, northern portion of the Kettleman Canal and Kettleman Pumping Plant #1 would be serviced by the Stratford Emergency Services. These northern facilities are located less than a mile from the Stratford Fire Station. Additionally, any security concerns could be addressed or patrolled by the Kings County Sheriff's Headquarters, located in Hanford, which has jurisdiction within unincorporated areas near Stratford.

Construction of the Kettleman Canal would involve some construction activities outside the five-mile response radius of Stratford. However, construction activities associated with the new canal would be temporary in nature and the addition of a new canal would not add permanent workers or staffed facilities to the Project area. The proposed Kettleman Weir and diversion structure (tie-in to the South Fork Canal) is within the five-mile response radius of Stratford. Because of the temporary nature of the construction activities and lack of permanent workers on-site, impacts are considered less than significant.

Site security during construction would minimize the need for emergency responses to the Project site. Therefore, the construction of these facilities would not disrupt response times to this area, nor would it lead to a population increase that would increase the service ratio or create additional demands or response facilities. Impacts are considered less than significant.

Other Facilities

Other Project facilities to be constructed include a new electrical switchyard and substation, maintenance yard, and five pumping plants within the Kettleman Reservoir. These Project facilities are all located within the five-mile radius of the Kettleman City fire and police substation, and services to this area would be within the five-minute response time specified in the Kings County General Plan (Kings County, 2010e). These other facilities are close enough to be serviced by police and fire departments within 20 minutes of a call, which aligns with the response time goal of the Kettleman City and Stratford emergency response teams specified in *KCCP Policy 7A.1.1* and *SCP Policy 7A.1.1* (Kings County, 2010d; 2010j). Since facilities are within appropriate service response times radii, substantial adverse physical impacts to response times would not result. Response times and service ratios to the other Project facilities during construction are not expected to be affected. Impacts are expected to be less than significant.

Operations & Maintenance

Impacts to fire and police protection services occur as the population of a given area increases through the development of residential units or commercial space. As population increases, demand for fire and police protection services, schools and parks increase proportionally, which may result in the need for new or expanded public facilities. The proposed Project would not change existing demand for public services (e.g., fire and police protection, schools, parks, libraries, or health clinics) because population growth would not result from operation of the proposed Project (see *Section 3.14, Population and Housing).* As implementation of the proposed Project would not change the demand for any of the public services, it would not require additional equipment or resources for those public service providers.

In addition, operation and maintenance of the proposed Project would not be labor intensive and would not increase the need for new staff from any of public protection services entities (e.g., police and fire). Once in operation, activities at the Project site would be limited to project operations in approximately three out of every ten years, plus routine inspections of the pipelines, canals, pumping plants, and levee impounds. Staff would drive to and around the facilities for regular inspections, but this activity would not result in the disruption of public services (e.g., police and fire).

The Project is not expected to affect the ability of local providers to maintain acceptable service ratios, response times or other performance objectives for fire protection, police protection, schools, parks, or other public facilities. Similarly, operation and maintenance of the Project would not substantially increase the need for new staff from the public service entities.

Storage Facilities

The storage facilities are anticipated to be in operation every three out of ten years, when flooding occurs and floodwaters would be stored. The Kettleman Reservoir is within a five-mile response radius of the Kettleman City police and fire substations, and emergency services can be provided to this area in under five minutes. Operation and maintenance activities would occur periodically and only temporarily increase traffic and crew at the storage facility. There would not be permanent staff or permanent facility crews as the reservoir would only be inspected on an annual basis. Existing Semitropic operations and maintenance staff would drive to the storage facilities to conduct maintenance activities. Since it is existing Semitropic staff who would be performing maintenance and operational responsibilities, the Project would not lead to an increase in population and would not result in the construction of new or expanded public service facilities (e.g. schools or libraries) in order to meet a new demand.

The recreational component of the storage facilities may increase demand for emergency services due to tourists/visitors. As described in *Section 3.16 Recreation*, when in operation, the reservoir would provide recreational opportunities for bird and wildlife viewing to the public that otherwise would not exist, but only in approximately three out of every ten years. The additional draw of wildlife viewing opportunities around the reservoir is expected to increase public visitation to the Project area, but not substantially more than the number of visitors who currently drive through the area to visit regional parks and local NWRs. Additionally, as the reservoir would be used for floodwater storage only approximately three out of 10 years, impacts on public services would not be significant.

During periods when the reservoirs are flooded and recreational activities are available for visitors, reservoir operations could potentially result in an intermittent increase in demand for services in an area with stressed service ratios. In case of the demand for fire, emergency, or police services, access to the storage facility site could occur through Quebec Avenue and State Highway 41. Response times to this area would be within the response time goals outlined in the Kings County General Plan (5 minutes) and the Kettleman City General Plan (20 minutes). While response times would not be affected, the service ratio could potentially be affected due to increased visitor traffic. Recreational facilities are within the five-mile range and five-minute response zone of the Kettleman City substation. However, with reservoir operations expected in only three out of ten years, visitation to the Kettleman Facility for recreational purposes is not expected to increase demand for local public services to the degree that local services would be negatively impacted; as such, impacts are expected to be less than significant.

Conveyance Facilities

Maintenance for conveyance facilities would be minimal; requiring periodic visual inspections of the pipelines and canals. Inspection staff would not be full time and would consist of current Semitropic staff. As a result, an increase in traffic to conveyance facilities is expected only during the periodic inspections. When maintenance activities are occurring, staff would drive along around diversion and conveyance facilities to note any unusual features. This periodic activity would not result in the disruption of public services (e.g., police and fire) as crew would utilize dike access roads and roads on top of reservoir embankments to perform inspections. Most of the conveyance facilities, including the Aqueduct Intertie structures, earthen conveyance channel, and southern portions of the Blakely Canal, are within five miles of the Kettleman City police and fire substations, and service to this area is expected to be under five minutes. The Empire Weir No. 2 and northernmost portion of the Project facilities are within a mile of the Stratford Fire Station. Additionally, any security concerns could be addressed or patrolled by the Kings County Sheriff's headquarters, located in Hanford, which has jurisdiction within unincorporated areas near Stratford. Once improvements are made, and the Project is in operation, it would remain within the jurisdiction of the Stratford Fire Department and Kings County Sheriff's headquarters in Hanford, as it currently is.

Once the Project is in operation, there would be no need for full time surveillance or patrols from local public services. The conveyance facilities would be secured with fencing, especially around the pumping plants and turn in/turn out structures, as a precautionary security measure in order to minimize the risk of increased emergency services. Overall, impacts to the demand for public services and response times from public services are expected to be less than significant.

Other Facilities

Maintenance for other Project facilities, including the maintenance yard, electrical switchyard and substation, and pumping plants within Kettleman Reservoir, would be minimal and occur periodically. The electrical substation would connect to an existing PG&E electrical transmission line for power. It is anticipated that the substation and switchyard would be maintained by PG&E staff. Service to this facility would mimic current servicing crews and schedules to other local substations (such as the one in Lemoore) and would not require additional services. Operation and maintenance activities would not result in the

disruption of public services (e.g., police and fire) nor lead to an increase in population that would require additional schools, parks, or other public facilities. Impacts are considered less than significant.

Additional security measures for the electrical switchyard and substation and maintenance yard may include security cameras, lighting, and screening. As noted above, the electrical substation would connect to an existing PG&E electrical transmission line for power and would be maintained by PG&E crews following similar servicing procedures as other substations in the area and therefore would not require additional attention from local services. Security personnel from nearby police departments would only be required on an as-needed basis if security concerns occurred. However, proper security measures, as mentioned above, would reduce the likelihood of needing police patrol or response to the area.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

See Mitigation Measure TRA-1: Traffic Management Plan, in *Section 3.17 Transportation*

Significance Determination after Mitigation

Less than significant with mitigation.

Cumulative Impacts

The geographic scope of potential cumulative impacts related to public services includes the Project area, Kings County, and the service areas of each of the agencies listed in *Section 3.15.1* above. There are six relevant projects within the vicinity of the proposed Project that may contribute to cumulative impacts:

- Quay Valley Community Development - a new 7,175-acre community to be developed in south Kings County.
- Kettleman Hills Facility Expansion - expanding the existing B-18 Landfill and construct a new B-20 Landfill for hazardous waste and designated waste disposal.
- Kettleman City Surface Water Treatment Plant and Commercial Water Storage Tanks (Treatment Plant) – construction of a new surface water treatment plant to treat surface water for potable supply.
- Southwest Groundwater Banking Project – development of a project to divert and store floodwater from the Kings River and local stormwater.
- JID Distributed Recharge Bypass and Lassen Projects – improvement to and construction of recharge facilities to divert and store floodwater from the Kings River.
- Terranova On-Farm Flood Capture and McMullin Recharge Site – improvements to and construction of facilities to divert floodwater from the Kings River for recharge on existing farm lands.

Cumulative projects would not result in a significant increase in demand for public services or result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities. Initial studies for the development of the Treatment Plant and the expansion of the Kettleman Hills Landfill found that construction and operation of these facilities would not create a significant demand for public safety services and therefore, would have no impact to public services. The development of the Quay Valley Community would likely require the addition of public services to the Project area through the addition of new schools, police officers, firefighters, and medical staff. This would have a beneficial impact on the Project and Project area.

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3.16 Recreation

This section evaluates potential impacts related to local and regional recreation that could result from implementation of the Project. Recreational resources (e.g., parks, bikeways, fishing access, etc.) within the Project area are described, along with related County General Plan polices. The impact analysis presents the standards used to evaluate impacts to recreational resources and addresses potential effects of the Project on such resources.

3.16.1 Environmental Setting

The following sections describe the environmental setting for recreational uses and facilities in the Project area.

Project Area

The Project area is located to the east of Interstate 5 and State Highway 41, near Kettleman City, in Kings County, California, north of the Kings-Kern County line. The Project area falls within the historic Tulare Lake bed, on lands currently used for dry grazing and cultivated agriculture and classified as Open Space Agriculture in the Kings County General Plan (Kings County, 2010e). Residents of nearby Kettleman City have access to recreational opportunities and facilities in the region, including several park and fishing areas, bikeways, and recreational centers. Specific recreational sites include: Kern and Pixley National Wildlife Refuges, the Colonel Allensworth State Historic Park, municipal and city parks, community swimming pools, sports fields, and swimming, boating, fishing, and picnicking areas that are publicly and commercially available on the Kings River (Kings County, 2009). The nearest residential land uses to the Project area are approximately one mile to the west of Kettleman Reservoir, in Kettleman City.

Parks and Recreation

Regional Parks

Kings County has a two acre per 1,000 residents park acreage goal (including parks with facilities that are not special purpose) (Kings County, 2009). Unincorporated Kings County (Project location) currently provides approximately 4.8 acres of parkland per 1,000 residents, which is more than the standard of two acres per 1,000 population (Kings County, 2009). Kettleman City, which is the community nearest to the Project area, provides 0.7 acres per 1,000 residents (Kings County, 2009), which is less than the County's standard.

There are no parks, recreational areas, educational facilities, religious sites, health care facilities, or commercial uses on the Project area. The nearest local park to the Project area is the Kettleman City Park, which is located less than a mile from the eastern edge of the Kettleman Reservoir. The nearest regional park, the Kern National Wildlife Refuge (NWR), is located approximately 18 miles southeast of the Kettleman Reservoir, along Dairy Avenue. That recreational area, along with additional parks within the region are described below.

Kern National Wildlife Refuge

Kern NWR, managed by the USFWS, is located approximately 18 miles southeast of the Kettleman Reservoir, as shown in **Figure 3.16-1**. The refuge consists of 11,249 acres of natural desert uplands, a relict riparian corridor, and developed marsh situated on what was once the largest freshwater wetland complex in the western U.S. (USFWS, 2015a). The Kern NWR provides optimum wintering habitat for migratory birds with an emphasis on waterfowl and water birds. Through restoration and maintenance of native habitat diversity, the refuge also provides suitable habitat for several endangered species as well as preserving a remnant example of the historic valley uplands in the San Joaquin Desert (USFWS, 2015a).

Pixley National Wildlife Refuge

Pixley NWR, managed as part of the Kern NWR complex, is located approximately 30 miles east of the Kettleman Reservoir, as shown in **Figure 3.16-1**. The refuge consists of approximately 6,939 acres of grasslands and seasonal marsh wetlands (USFWS, 2015b). This habitat provides nesting, foraging, and cover for a variety of species including threatened Tipton kangaroo rats, blunt-nosed leopard lizard, Sandhill cranes, and the endangered San Joaquin kit fox (USFWS, 2015b).

Colonel Allensworth State Historic Park

The Colonel Allensworth State Historic Park is located approximately 30 miles east of the Kettleman Reservoir, as shown in **Figure 3.16-1**. This 3,712-acre historic state park is a collection of restored and reconstructed early 20th century buildings, including the house of Colonel Allensworth, historic schoolhouse, Baptist church, and library (Parks, 2016). In addition, the park is popular for its biking trails, hiking trails, horseback riding, and campsites which are available year-round, along with picnic tables, a fire ring and turf, trees, and shade ramadas. The park hosts an annual rededication celebration and its visitor center features a film about the history of the site and the pioneer settlement.

Local Parks and Recreation

There are six local and community park facilities totaling approximately 130 acres within unincorporated Kings County, as shown in **Table 3.16-1** (Kings County, 2010h). The County owns and operates three regional parks - Burris, Hickey, and Kingston - which total approximately126 acres. These parks are located in the northern half of the County, apart from urban concentrations. The Kettleman City and Armona Community Service Districts each maintain a community park within their respective service areas. Properties within Kings County include the following.

Burris Park

Approximately 57 acres in size, Burris Park is maintained by the Burris Park Foundation in Kingsburg, California (Kings County, 2010h). The park serves as an educational campsite for 4th and 5th graders in the County to tour the park and learn about the County as well as local flora and fauna. The Kings County Sportsman's Club utilizes Burris Park for weekly meetings and hosts activities such as pot shoots (every second Sunday of the month). Additional recreational amenities at Burris Park include the Kings County Museum, wagon barn, picnic area, and general recreation areas. Burris Park is located approximately 30 miles north of the Kettleman Reservoir and 24 miles north of the Empire Weir No. 2.

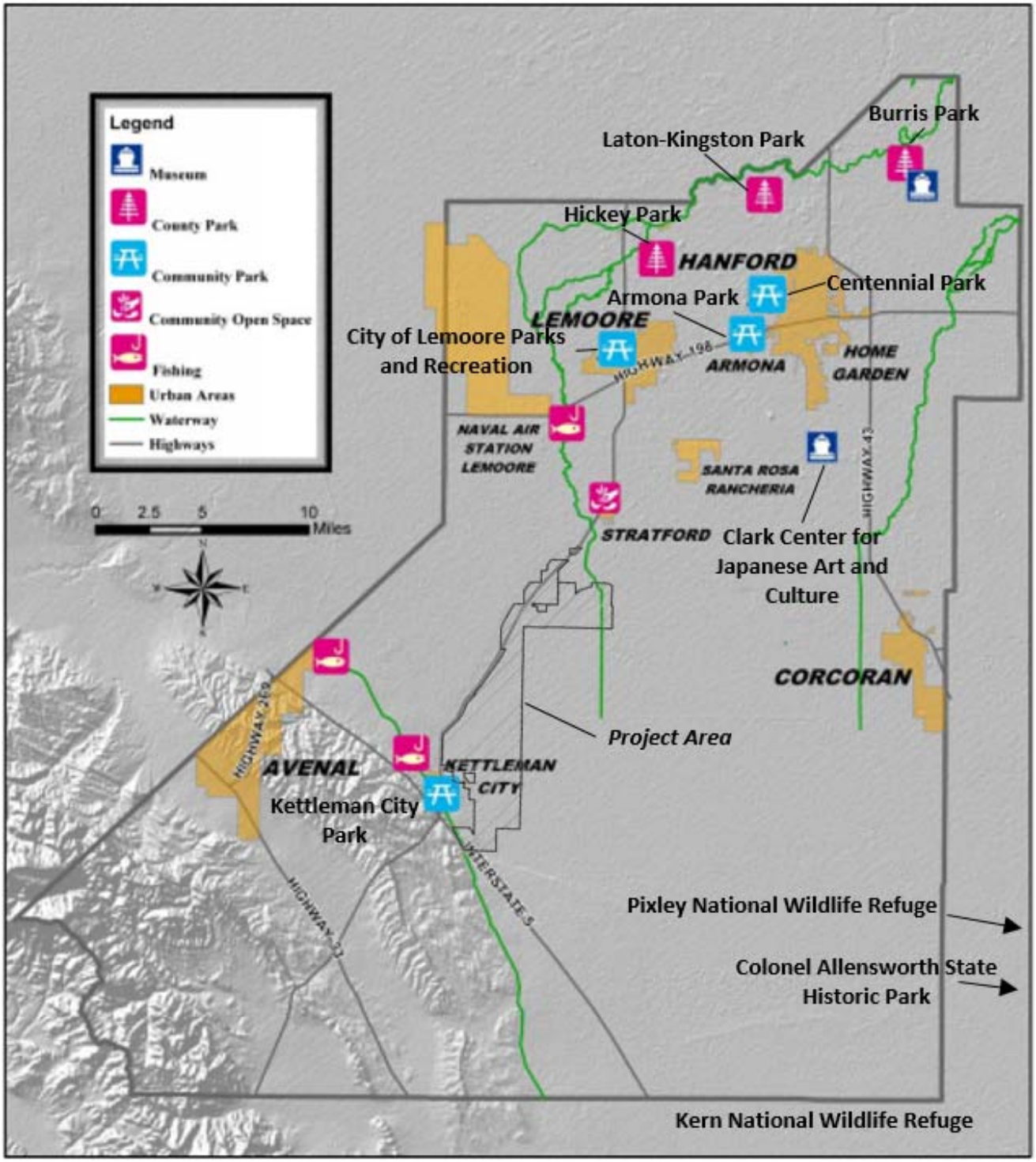
Hickey Park

Hickey Park is located north of Douglas Avenue and is primarily open space with grass and trees. Additional recreational amenities include picnic areas and an 18-hole disc golf course. Hickey Park is located approximately 20 miles north of the Kettleman Reservoir and 14 miles north of the Empire Weir No. 2.

Laton-Kingston Park

Approximately 102 acres in size, Laton-Kingston Park is located along the Kings River in Laton, California and is primarily open space with grass and trees, consisting of 22 acres of developed trees and turf (Kings County, 2010h). Laton-Kingston Park is a popular attraction for its beach, swimming in the Kings River, picnic areas, playground, and public BBQ equipment. This park is located approximately 26 miles north of the Kettleman Reservoir and 18 miles north of the Empire Weir No. 2.

Figure 3.16-1 Regional Parks in the Project Area



Source: Kings County General Plan, Open Space Element, 2009.

Kettleman City Park

Kettleman City currently has one city-owned park, managed by the Kettleman City Community Services District, in the center of a residential area, located along General Petroleum Avenue. Additional recreational facilities are located south of the Kettleman City Elementary School, along the intersection between 6th Street and General Petroleum Avenue. The elementary school provides a soccer playing field, a swimming pool, and tennis and basketball courts for local residents. Fields are maintained by Chemical Waste Management, Inc. Besides these amenities, the community has little else in the way of recreational open space. In 2009, the ratio of parkland to population in Kettleman City was 0.7 acres per 1,000 residents (Kings County, 2009). Undeveloped open hillsides provide ample surrounding open space; however, most of these areas are not very accessible. Kettleman City Park is located less than a mile east of the Kettleman Reservoir.

Armona Park

One existing 6.2-acre park is also located southeast of the center of town and is owned by the Armona Community Services District and maintained by the Armona Union Elementary School District. This community park provides two ball fields, a newly constructed children's play area, picnic areas, open grass area and parking. Additional park space is planned for new community growth north of Armona and is anticipated to serve the growing residential population north of Front Street and east of 14th Avenue. This park is located approximately 10 miles north of the Empire Weir No. 2.

Table 3.16-1: Existing and Planned Parks within Kings County

Park Name	Acreage	Type	Location
Existing Parks and Recreation Areas within County Limits			
Burris Park	57.0	Regional	Unincorporated County Land
Hickey Park	45.6	Regional	Unincorporated County Land
Kingston Park	23.8	Regional	Unincorporated County Land
Armona Park	6.2	Community	Armona
Kettleman City Park	1.1	Community	Kettleman City
Total Existing Acreage	**133.7**		
Planned Parks and Recreation Areas within County Limits[1]			
North Expansion Area Park	**3.5**	Community	Armona
Armona Depot	**1.4**	Community	Armona
Home Garden Shaw Place Park	**2.5**	Community	Home Garden
Kettleman City Park	**0.8**	Community	Kettleman City
Kettleman City Park	**1.0**	Community	Kettleman City
Stratford Laurel Avenue Park	**4.2**	Community	Stratford
Total Planned Acreage	**13.4**	Community	
Total Existing and Planned Acreage	**147.1**		

Source: Kings County General Plan Update Final Environmental Impact Report, 2009
Notes:
1. These parks are being planned and not yet developed.

Additional recreational facilities in the vicinity of the Project area (not county-owned) include the following.

City of Lemoore Parks and Recreation

The City of Lemoore hosts ten parks and recreational facilities, including Lemoore City Park No. 1, Heritage Park, Lions Park, Lemoore Plaza, Lemoore Rotary Youth Plaza, Lemoore Arbor Plaza, 19th Avenue Park, Lemoore Civic Auditorium, Veterans Memorial Building, and the Lemoore Teen Center. Recreational facilities include gazebos, BBQ and picnic areas, playgrounds, a skate park, water park fountain, open air venue, softball fields, and a BMX track (City of Lemoore, 2016). These facilities are located approximately 16 miles north of the Kettleman Reservoir and approximately 10 miles north of Empire Weir No. 2.

Centennial Park

Centennial Park is located at 11731 Hanford Armona Road, and is approximately 10 acres in size. Centennial Park's recreational facilities include a volleyball court, playground, water fountain park, dog run, and disc golf course. The park is located 20 miles north of the Kettleman Reservoir and14 miles north of Empire Weir No. 2.

Clark Center for Japanese Art and Culture

The Clark Center for Japanese Art and Culture, located at 15770 10th Avenue in Hanford, is a museum known for its collection of over 1,250 historic Japanese artifacts and art pieces including paintings, sculptures, prints, ceramics, and bamboo works which span 1,200 years of Japanese artistic history (Kings County, 2010h). It is only one of two museums in the United States that focuses exclusively on historic Japanese art. In addition, the Clark Center is known for its large collection of over 100 sculpted bonsai trees, which is the third largest in California (Kings County, 2010h). The museum is located 10 miles north of Empire Weir No. 2 and 16 miles north of Kettleman Reservoir.

Local Bikeways

A review of available maps indicates that no designated bikeways traverse the Project area. For further discussion of bikeways, see *Ch 3.17 Transportation.*

Fishing Access

Recreational fishing in Kings County occurs primarily along the banks of the Kings River, which is administered by the State Reclamation Board. Three additional fishing locations along the California Aqueduct are also maintained by the County, including one near Kettleman City and another near the Avenal Cutoff. Only a few public boat launching sites exist along the Kings River in Kings County.

Empire Weir No. 2, located a mile southwest of Stratford, collects water for diversion into the Tulare Lake bed, South Fork Canal, and Blakeley Canals (KRCD and KRWA, 2009). The pool formed by Empire Weir No. 2 holds water at nearly all times of the year and supports warm water fisheries and trout populations, and is especially popular for anglers.

3.16.2 Regulatory Framework

This section describes laws and regulations at the federal, state, and local level that may apply to the proposed Project.

Federal Policies and Regulations

Public Law 102-575, Title 34, Central Valley Project Improvement Act (CVPIA)

See *Section 3.5.2, Biological Resources, Regulatory Framework.*

Public Law 105-57, National Wildlife Refuge System Improvement Act of 1997

See *Section 3.5.2, Biological Resources, Regulatory Framework.*

State Policies and Regulations

Public Trust Doctrine

The Public Trust Doctrine espouses the notion that title to lands under navigable waters up to the high water mark is held by the state in trust for the people (California State Lands Commission). The Submerged Lands Act grants states sovereignty over tide and submerged lands, and the Supreme Court established the states' duty to protect (in perpetuity) the public's interest in these areas.[1] The California Supreme Court has interpreted the range of public interest values in these waterways to include general recreation activities such as swimming and boating, as well as preservation of lands in their natural state as open space, as wildlife habitat, and for scientific study.[2,3]

Local Policies and Regulations

Kings County General Plan

The Open Space Element (Kings County, 2010h) and Resource Conservation Element (Kings County, 2010i) of the Kings County General Plan describe the health, economic, and natural resource benefits of recreation and the necessity of providing recreational opportunities for all of the County's residents.

The King County's Open Space Element identifies the County's "open space land" and establishes guiding goals for the preservation and conservation of land within the County that is essentially unimproved and devoted to open space use (e.g. natural resources, outdoor recreation, public health and safety). The Open Space Element includes the following goals relative to parks and recreational facilities:

- *OS Goal B1:* Maintain and protect the scenic beauty of Kings County.
- *OS Goal C1:* Preserve the visual identities of Community Districts by maintaining open space separations between urban areas.
- *OS Goal D1:* Provide for parks, recreation, and open space that will serve the current and future needs of County residents and visitors.
- *OS Policy D1.1.2:* Community plans should facilitate the development and maintenance of community park(s) within Community District areas to expand recreational resources available to residents.
- *OS Policy D1.2:* Encourage the development of private recreational facilities compatible with the rural character of Kings County.
- *OS Goal E1:* Maintain open space areas near Naval Air Station Lemoore and underlying low level military airspace corridors and ranges.
- *OS Goal F1:* Ensure that Community Districts integrate adequate open space as part of their Community Plans.

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[1] *Illinois Central Railroad v. Illinois,* 146 U.S. 387 (1982).
[2] *Marks v. Whitney* (1971) 6 Cal.3d 251; *National Audubon Society v. Superior Court* (1983) 33 Cal.3d 419; *People v. California Fish Co.* (1913) 166 Cal. 576.
[3] Frank, R. M. 1983. "Forever Free: Navigability, Inland Waterways, and the Expanding Public Interest." *University of California, Davis Law Review:*16:579.

The Resource Conservation Element (Kings County, 2010i) includes the following goal relative to parks and recreational facilities:

- *RC Object F1.1:* Protect freshwater recreational fishing along the Kings River and the California Aqueduct by balancing agricultural and development needs with the protection of these resources.

Kettleman City Community Plan

Kettleman City has identified the following objectives and goals in the Kettleman City Community Plan (Kings County, 2010d), part of the Kings County General Plan, relevant to the preservation and conservation of land within the County that is essentially unimproved and devoted to open space use (e.g. natural resources, outdoor recreation, public health and safety). The Community Plan includes the following goals relative to parks and recreational facilities

- *KCCP Objective 3A.2:* Provide and maintain parks, open space and community gathering places in locations that are convenient to community members.
- *KCCP Goal 3B:* Enhance community connectivity to encourage pedestrian outdoor use of open space and increase outdoor physical activity.
- *KCCP Objective 3C.1:* Provide opportunities for increased recreational activities within the community.

3.16.3 Impact Analysis

Methodology for Analysis

Potential impacts on parks and recreation are analyzed based on the potential for the Project to affect the facilities described above in *Section 3.16.1, Environmental Setting* during Project construction or operation. The analysis is based on the Project's preliminary design information, including construction methods and procedures, and Project design and management, when weighed against the baseline environmental conditions of recreational facilities in the Project area.

Thresholds of Significance

For the purposes of this analysis, an impact to recreation would be significant if the Project would:

- 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;
- Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment;

Impacts and Mitigation Measures

Impact REC-1 Substantial Impairment of the Use of Existing Parks or Other Recreational Facilities

Construction

Storage Facility

Construction of the Kettleman Reservoir would require the delivery of necessary construction materials and workers to the Project area, who would use access roads adjacent to the site that are commonly used by visitors to surrounding regional parks. Material delivery trucks and construction workers would access the Kettleman Reservoir using Interstate 5, State Highway 41, Quebec Avenue and Racine Avenue. During construction, increased traffic on these roads could disrupt or inconvenience travel to and from area parks, but it would not lead to an increase in visitation or result in the physical deterioration of existing facilities, since construction activities at the Project area would occur between 7:00 AM and 6:00 PM, Monday

through Friday. Peak visitation hours to the Kern and Pixley National Wildlife Refuges occur on weekends, so Project construction activities would not interfere with weekend visitors. Impacts to traffic and transportation are expected to be less than significant, as discussed in *Chapter 3.17 Transportation*. Additionally, several alternative routes are available for travel to regional parks, which would allow the public to avoid areas where construction would occur. As such, there would be no significant impacts.

Conveyance Facilities

Construction of Project conveyance facilities would include the development of the Kettleman Canal, the Aqueduct Intertie and the South Fork Canal, and improvements to the South Fork Canal and Empire Weir No. 2. Deliveries to the Project area would be made using Interstate 5 or State Highway 41, and would enter the site at 25th Avenue. These roads are sometimes used by visitors to access local and regional parks, particularly Kettleman City Park, which is located less than a mile from the Aqueduct Intertie facilities and southern sections of the Kettleman Canal and Blakeley Canal. Since local and regional parks can be accessed via 25th Avenue, measures would need to be in place during construction to ensure roads to these parks are accessible and that construction would not disrupt the use of these existing parks. *Chapter 3.17 Transportation* further describes the Project's traffic related impacts.

During construction, improvements to Empire Weir No. 2 would temporarily disrupt recreational fishing activities that occur in the pool of water created by the weir. However, most fishing occurs upstream, north of the weir in a pond that supports warm water fisheries and trout populations nearly year-round (as described above in Section 3.16.1 Fishing Access). During construction, visitors intending to fish would have limited access to the weir and would have to use alternative points of access. However, this limited access would be temporary, occurring only during a portion of the construction period. Normal fishing activities and access points would become available following construction.

Water trucks would be utilized during construction to maintain dust control, and ensure excess dust does not travel to neighboring sites, such as nearby parks like the Kettleman City Park, as described in *Chapter 3.4 Air Quality*. Despite increased traffic from deliveries and increased foot traffic from construction workers, the Project's conveyance construction activities would not substantially impair the use of existing parks or facilities. As such, there would be no significant impacts.

Other Facilities

Construction of the Project's other facilities, such as the electrical switchyard and substation, maintenance yard, and pumping plants would not have any direct impacts on local parks and recreation and would not lead to the degradation of local parks. Construction activities could obstruct some roads used to travel to parks in the area, including Interstate 5, State Highway 41, Quebec Avenue, Racine Avenue, and 25th Avenue, but as explained in *Chapter 3.17 Transportation*, impacts to traffic are considered to be less than significant. Furthermore, construction of the Project's non-storage and non-conveyance facilities would not lead to an increase in population that would increase local park use. As such, there would be no significant impacts.

Operations & Maintenance

Storage Facility

As described in *Chapter 3.4 Biological Resources,* the intermittent storage of floodwaters in the Kettleman Reservoir would result in the development of shallow aquatic habitats that would attract native species, waterfowl, and migratory birds to the Project area. The reservoir's design incorporates different educational and recreational design elements including observation decks and informational plaques intended for public use to learn about the history of the area, anthropogenic changes to land use, and information on native species. Educational plaques would provide visitors with a discussion on the former Tulare Lake and Pacific Flyway. Two observation decks, one off Quebec Avenue and another off Wassiam Road, would provide viewing areas for bird watching. The proposed viewing decks would be similar to those at the Kern and

Pixley NWRs, located about 18 miles to the southeast east of the Kettleman Reservoir. The similarity of this Project's recreational component to the nearby wildlife refuges could increase the use of existing parks. In addition, visitors to regional parks may also stop by the Project's wildlife viewing decks on their way to the local NWRs, since they are approximately a 20-minute drive from the Kettleman Reservoir. Although the Project's recreational opportunity benefits have the potential to increase visitation to local regional parks, the increase in visits would likely not be substantial enough to lead to the degradation of the parks.

Additionally, increased recreational tourism would benefit neighboring communities and would align with recreation goals specified in the Kings County General Plan and Kettleman City General Plan, such as *OS Goal D1* "provide for parks, recreation, and open space that will serve the current and future needs of County residents and visitors" (Kings County, 2010h). Establishment of educational and recreational facilities also promotes public trust values. As specified in the Public Trust Doctrine, waterways that establish "general recreation activities" or preserve "lands in their natural state as open space, as wildlife habitat, and for scientific study" are preservations of protect public interest values. Collectively, the Project's operational period impacts on recreation are considered to be beneficial.

Conveyance Facilities

Once in operation, conveyance facilities would require little maintenance, consisting primarily of periodic visual inspections of pipelines and canals. These activities would not result in an increased demand for park services, nor would they impair the use of existing recreational facilities.

Proposed facilities that would convey water to the Kettleman Reservoir (including the Empire Weir No. 2, the South Fork Canal, Blakeley Canal and Kettleman Canal) would provide beneficial impacts by supporting the development of native ecosystems and providing recreational opportunities for residents and visitors. The Project's conveyance facilities would result in no impacts to recreational opportunities or facilities.

Other Facilities

Operation of other Project facilities, including the maintenance yard, pumping plants, and electrical switchyard and substation, would require periodic visual inspections, but would not increase demand for park services or create the need for additional park facilities. The Project would have no impacts to recreation from these facilities.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact REC-2 Include Recreational Facilities or Require Construction or Expansion of Planned Recreational Facilities

Construction

Storage Facility

Construction of the Kettleman Reservoir would not require the expansion of existing recreational facilities, though it would lead to the construction of new recreational facilities. The Kettleman Reservoir would intermittently convert parts of the (now dry) Tulare Lake bed to a shallow open water habitat when flooded. This conversion to an aquatic habitat would attract native waterfowl and migratory bird populations. To acknowledge the conversion of the area back to its natural state, the Project would include recreational and educational elements for public use. Recreational components of the Project to be constructed would include wooden observation platforms, educational signage regarding the Pacific Flyway, aquatic wildlife,

and historic Tulare Lake bed, and road improvements and turnouts along State Highway 41 and Quebec Road to provide public access to wildlife viewing areas. The Project's proposed wildlife observation components would provide recreational benefits similar to those at the nearby Kern and Pixley NWRs.

Construction of recreational elements for the storage facility, such as observation platforms and educational signage, would align with policies in the Kings County General Plan and local community plans, such as *OS Goal D1:* "Provide for parks, recreation, and open space that will serve the current and future needs of county residents and visitors" (Kings County, 2010h). Additional local plans address locations for the proposed facilities, aesthetics, and ongoing funding mechanisms to support the long-term maintenance of new neighborhood parks. Implementing suggestions from these local plans would further mitigate potential community concerns regarding potential impacts resulting from these facilities. Overall, construction of the Project's storage components would have no negative impacts on recreational facilities.

Conveyance Facilities

Construction of the Project's new conveyance facilities and improvements made to the South Fork Canal and Empire Weir No. 2 would not require the development of recreational facilities or the expansion of planned recreational facilities. Conveyance facilities would facilitate flooding of the Kettleman Reservoir, and therefore, intermittently simulating the aquatic environment that once existed there. However, construction of the conveyance facilities itself would not result in an increased use of recreational facilities that would require construction or expansion of recreational facilities.

Improvements made to the Empire Weir No. 2 during construction would hinder fishing activities that occur in the pool of water created by the weir. However, most fishing occurs upstream in the pool north of the weir. During construction, visitors intending to fish would have limited access to the weir and would have to use alternative points of access. However, this inconvenience would be temporary, occurring only during a portion of the Project's construction period. Normal fishing activities and availability of access points would resume following the end of construction activities. Therefore, the Project's impacts from construction of conveyance facilities are considered less than significant.

Other Facilities

Construction of the electrical switchyard and substation, maintenance yard, and pumping plants would not require the development of recreational facilities or expansion of planned recreational facilities. The Project would therefore have no impact from construction of these facilities.

Operations & Maintenance

Storage Facilities

During the Project's operational period, floodwaters from the Kings River would be diverted southward into the South Fork of the Kings River where they would eventually be diverted and stored in the Kettleman Reservoir. This would result in intermittent flooding of the area, creating a shallow open water habitat attracting migratory birds, waterfowl, and other wetland species along the Pacific Flyway. The Project would include recreational and educational elements, including educational signage and observation decks. Access to these viewing decks would be available off Quebec Avenue and Wassiam Roads. These educational elements would inform users of the history of the Tulare Lake bed and characteristics of the Project, providing a connection between the facility and the new recreational users.

Various physical buffers (such as location, fencing, landscaping, and enclosed structures) would screen views of the Project's industrial features from visiting recreational users. By incorporating wildlife viewing areas for public use, the Project would expand water-related recreation opportunities for area residents and outdoor-oriented tourists. The Kern and Pixley NWRs, located roughly 10 miles to the south and to the east of the proposed Project, respectively, attract thousands of visitors each year who engage in bird-watching, wildlife photography, and self-guided tours. The Project would provide similar recreation opportunities and

would be easily accessible to the public, particularly on the west side of the Kettleman Reservoir, which parallels Interstate 5 near Kettleman City. The potential increase in recreational traffic to the area would only occur during years the reservoirs are flooded, approximately three out of every ten years.

The duality of this Project as both a water conveyance and storage facility and a recreational area aligns with many policies and objectives in the local General Plans, including the Kings County General Plan Open Space Element's *OS Goal D1* "Provide for parks, recreation, and open space that will serve the current and future needs of county residents and visitors" (Kings County, 2010h). In these aspects, the development of a new recreational area within the county would benefit the community and operation of the Project would not cause impacts to or require the expansion of recreational facilities in the area.

Conveyance Facilities

Operation of the Project's conveyance facilities would not lead to a population increase which would increase the demand for recreational facilities. The Project's operations would therefore not have any impact on the area's recreational facilities.

Other Facilities

Once in operation, the electrical substation, maintenance yard, and pumping plants would not require the development of recreational facilities or expansion of planned recreational facilities. These Project facilities would have no impact on the area's recreational facilities.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Cumulative Impacts

The geographic scope of cumulative impacts on recreational resources encompasses the Project area. Several projects are under construction or are in the planning phases in the vicinity of the proposed Project's facilities, which makes them relevant to an analysis of the Project's cumulative impacts. The relevant other projects include:

- Quay Valley Community Development - a new 7,175-acre community to be developed in south Kings County.
- Kettleman Hills Facility Expansion - expanding the existing B-18 Landfill and construct a new B-20 Landfill for hazardous waste and designated waste disposal.
- Kettleman City Surface Water Treatment Plant and Commercial Water Storage Tanks (Treatment Plant) – construction of a new surface water treatment plant to treat surface water for potable supply.
- Southwest Groundwater Banking Project – development of a project to divert and store floodwater from the Kings River and local stormwater.
- JID Distributed Recharge Bypass and Lassen Projects – improvement to and construction of recharge facilities to divert and store floodwater from the Kings River.
- Terranova On-Farm Flood Capture and McMullin Recharge Site – improvements to and construction of facilities to divert floodwater from the Kings River for recharge on existing farm lands.

The proposed Project would expand local recreational opportunities by incorporating wildlife viewing areas for public use into the design of the Kettleman Reservoir. Similar to the proposed Project, Quay Valley would also provide a new source of recreation for the public through the development of approximately 130 acres of planned passive and active recreational areas within the community (Kings County, 2016e). CEQA documentation for the other related projects, including the expansion of the Kettleman Hills Facility, Construction of the Kettleman City Water Treatment Plant, and the Southwest Groundwater Banking Project, have found no impacts related to local recreation as these projects would neither alter existing recreational facilities nor increase demand on existing recreational facilities. Project implementation would therefore result in an overall beneficial impact on recreational resources.

3.17 Transportation

This section evaluates potential impacts related to transportation and traffic that could result from implementation of the Project. The analysis is based on a review of traffic facilities in the Project vicinity and local transportation plans.

3.17.1 Environmental Setting

The following sections describe the environmental setting for transportation and traffic within the Project area.

Regional Setting and Project Vicinity

The proposed Project would be located to the east of Interstate 5 and State Highway 41, near Kettleman City, in Kings County, California, north of the Kings-Kern County line. The Project area falls within the historic Tulare Lake bed, on lands currently used for dry grazing and cultivated agriculture. The Project area is generally bounded by State Highway 41 and Kettleman City on the west, Laurel Avenue and the City of Stratford on the north, the Gates-Jones Canal on the east, and Utica Avenue to the south, and has two local roads, Quebec Avenue and Racine Avenue, running east to west through the Project area. **s**hows the Project area, as well as names of roads that may be affected by the Project.

Regional Transportation Network

Kings County is served by several major highways, including Interstate 5 and the State Highways 33, 41, 43, 198, 269, and 137. State Highway 33 is a two-lane, north-south route that runs mostly parallel to Interstate 5 between Interstate 5 and Maricopa. State Highway 41 and State Highway 43 are both two-lane highways with a north-south alignment through the county. State Highway 41 runs along Blakeley Canal, adjacent to where a large portion of the Project would be located. State Highway 43 runs to the east of State Highway 41, branching off State Highway 99 in Fresno, north of Kings County, and heads southeast towards Bakersfield. State Highway 198 runs east-west between Interstate 5 and State Highway 99 through Lemoore, in the northern area of the county outside of the Project area. State Highway 269 is entirely within the city of Avenal, running north out of the county and merging with State Highway 145 by Westside. State Highway 137 runs into the city of Corcoran from northeast portion of the county. Figure 3.17-2 is from the Kings County General Plan Circulation Element showing the regional transportation setting.

Designated Truck Routes

All highways mentioned in the regional transportation network described above are part of the California Truck Network. All county roads, unless otherwise signed, are designated truck routes. Heavy-duty trucks are the major transportation for goods movement along the following highways in Kings County (Kings County, 2010a):

- Interstate 5 – 30 percent heavy vehicles
- State Highway 33 – 8 percent heavy vehicles
- State Highway 41 – 18 percent heavy vehicles
- State Highway 43 – 16 percent heavy vehicles
- State Highway 137 – 18 percent heavy vehicles
- State Highway 198 – 16 percent heavy vehicles
- State Highway 269 – 19 percent heavy vehicles

Figure 3.17-1: Proposed Project Location

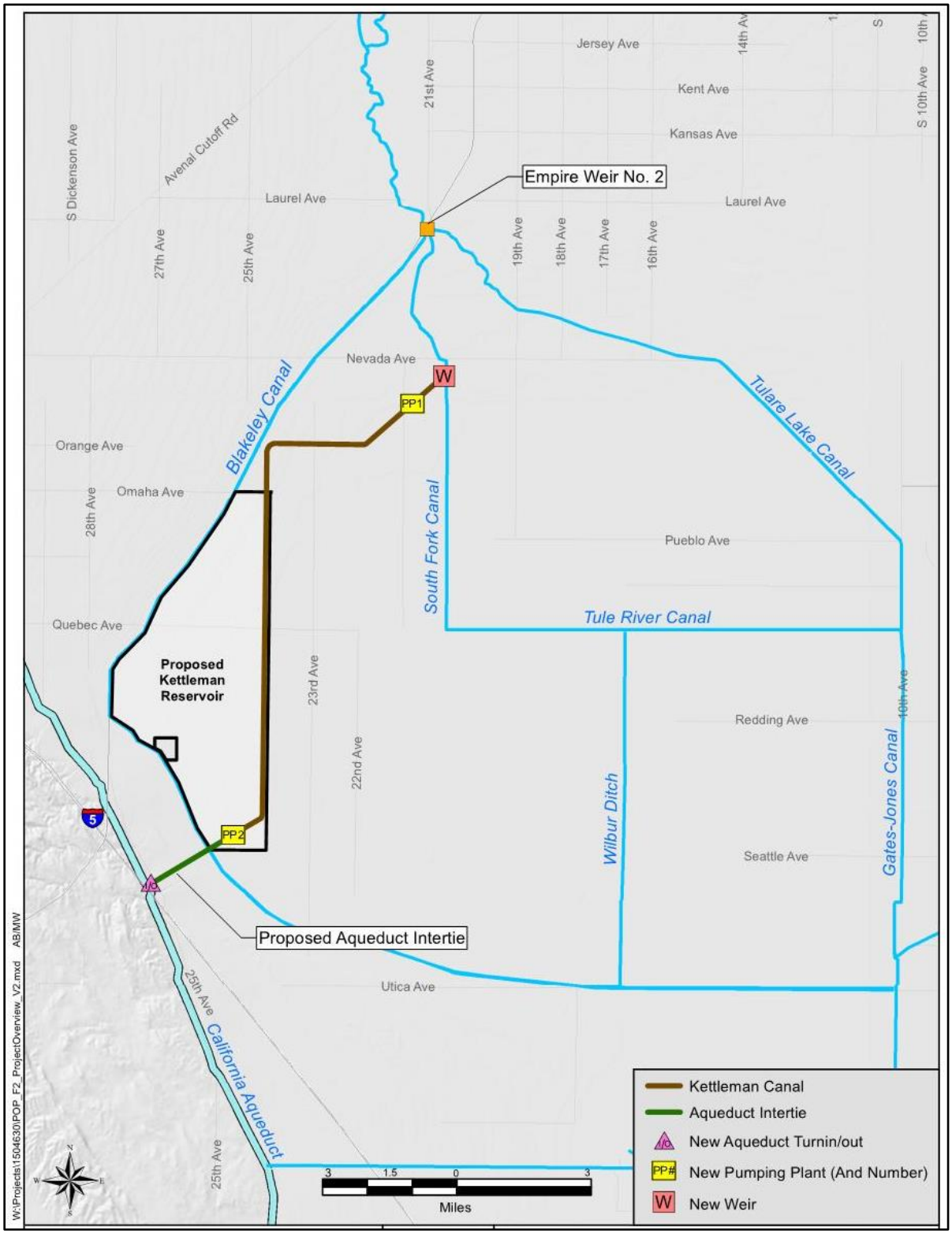
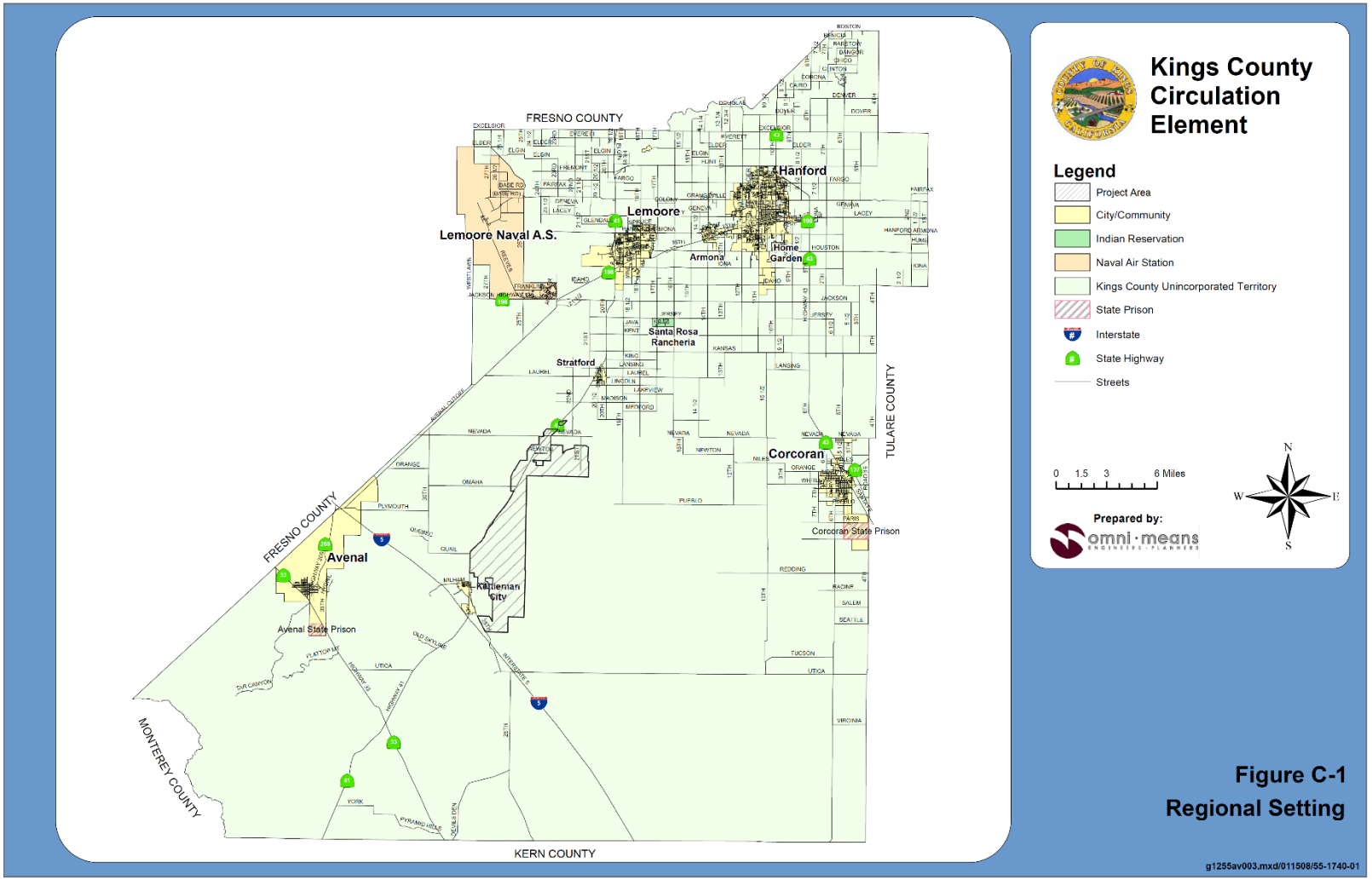


Figure 3.17-2: Regional Transportation Setting in Kings County



Source: Kings County General Plan Circulation Element (2010).

Transit Service

Amtrak's San Joaquin train route has stations within Kings County in the communities of Hanford and Corcoran, and makes several daily trips both northbound and southbound between San Francisco and Bakersfield. Amtrak California Thruway bus connections are also available daily with stops in Visalia, Goshen, Hanford, Lemoore, and Kettleman City. Greyhound buses travel through Kings County on varying schedules and stop at the following stations: Lemoore, Hanford, Visalia, Goshen, Farmersville, Exeter, and Tulare.

Kings Area Rural Transit (KART) provides public transportation around the Kings County area, offering transportation between the following cities: Armona, Avenal, Corcoran, Grangeville, Hardwick, Hanford, Kettleman City, Laton, Lemoore, and Stratford. KART provides public transit service during the weekdays, with limited service on Saturdays. In addition to eight routes running through downtown Hanford on Monday through Saturday, the following six KART routes run within Kings County:

- Hanford-Lemoore route: runs half-hourly on weekdays with less frequent service on Saturdays; five buses also make trips to Naval Air Station Lemoore (NAS) on weekdays
- Hanford-Avenal route: runs three times weekdays and two times on Saturdays, traveling through Kettleman City
- Hanford-Corcoran route: offers two weekday trips between the transit center in Hanford and the state prison in Corcoran
- Hanford-Visalia route: makes three weekday loops between the two cities, with an altered shorter last route of the day
- Hanford-Fresno route: runs once northbound in the morning and once southbound in the afternoon on weekdays
- Hanford-Laton route: runs twice daily on weekdays

KART also offers Agricultural Industries Transportation Services (AITS) and KART Vanpool programs with customized routes for agricultural farmworkers or general workforce commuters in the area. Similarly, Hanford also has a park and ride facility that can be used by carpoolers and vanpoolers.

Bikeways/Pedestrian Circulation

Due to the rural, agricultural nature of the Project area, there are limited dedicated bikeways and pedestrian facilities within Kings County. The vast majority of bicycle paths and pedestrian trails are located in the cities of Avenal, Corcoran, Hanford, and Lemoore. No designated bicycle facilities exist within the Project area.

Parking

On-street and off-street parking is available depending on the location within the County. Parking lots are available in certain areas of the cities.

Railroads

Aside from the Amtrak passenger rail described in the "Transit" section above, rail is also a mode of transport for agricultural, industrial, and manufacturing goods through Kings County. There are two rail lines that provide freight rail service within the county. The Burlington Northern & Santa Fe (BN&SF) Railway line runs south to north from Bakersfield to Roseville, connecting with major markets in Northern and Southern California. The San Joaquin Valley Railroad (SJVRR) runs east-west from Visalia to Huron,

crossing over the BN&SF rail but not connecting with it. The SJVRR right-of-way has been identified for preservation for possible future development.

The California High Speed Rail Authority (Authority) is currently implementing a high-speed rail system throughout the state. The rail plan does not include any stops within Kings County, but the rail line would pass through the northeastern corner of the county while traveling between Fresno and Bakersfield. All existing and planned railroads are located outside the Project area.

Existing Traffic Volumes

Level of service (LOS) is a measure of the performance of transportation facilities. LOS A and B represent free flow or reasonably free flow operations, and LOS E and F represent high levels of congestion and unstable traffic flow. **Table 3.17-1** below provides descriptions of each LOS category.

Table 3.17-1: LOS Definitions/Characteristics

LOS	Description
A	Represents free flow. Individual users are virtually unaffected by the presence of others in the traffic stream.
B	Stable flow, but the presence of others in the traffic stream begins to be noticeable.
C	Stable flow, but marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by interaction with others in the traffic stream.
D	Represents high density, but stable flow.
E	Represents operating conditions at or near the capacity level.
F	Represents forced traffic flow or a breakdown in traffic flow.

The Kings County General Plan designates LOS "E" as the minimum threshold for urban areas and LOS "D" for rural areas (Kings County, 2010a). **Table 3.17-2** below shows year 2006 average annual daily traffic (AADT) and LOS levels for roadways that may be affected by the Project. Existing traffic conditions are relatively consistent throughout the County and are all LOS C or above.

Table 3.17-2: Kings County Annual Average Daily Traffic Volumes and Levels of Service

Roadway Segment	Limits	2006		
		No. of Lanes	AADT	LOS
Interstate 5	Kern Co. Line – Utica Avenue	4	31,500	B
Interstate 5	Utica Avenue – State Highway 41	4	32,500	B
Interstate 5	State Highway 41 – Fresno Co. Line	4	34,500	B
State Highway 33	Kern Co. Line – State Highway 41	2	2,500	B
State Highway 33	State Highway 41 – 7th Avenue	2	2,400	B
State Highway 33	7th Avenue – State Highway 269	2	2,400	B
State Highway 33	State Highway 269 – Fresno Co. Line	2	2,300	B
State Highway 41	Kern Co. Line – State Highway 33	2	7,500	C
State Highway 41	State Highway 33 – Interstate 5	2	6,700	C
State Highway 41	Interstate 5 – Bernard Drive	4	9,500	B
State Highway 41	Bernard Drive – Quail Avenue	2	7,100	C
State Highway 41	Quail Avenue – Nevada Avenue	2	8,300	C
State Highway 41	Nevada Avenue – Jackson Avenue	2	8,500	C
State Highway 41	Jackson Avenue – State Highway 198	2	9,700	C
State Highway 41	State Highway 198 – Bush Street	4	14,200	B
State Highway 41	Bush Street – Houston Avenue	4	18,000	B
State Highway 41	Houston Ave. – Hanford –Armona Rd.	4	18,000	B
State Highway 41	Hanford-Armona Road – Grangeville Boulevard	4	20,000	B
State Highway 41	Grangeville Blvd. – Fresno Co. Line	4	18,000	B

Source: General Plan. Chapter 5: Circulation Element, 2010

Project Setting

As shown in **Table 3.17-3**, the highest peak hour traffic volume along State Highway 41 in the immediate vicinity of the Project (between Interstate 5 and Jersey Avenue) is 1,150 vehicles, and the LOS for this stretch of State Highway 41 (from Interstate 5 to Jersey Avenue) ranges from A to C. The percentage of daily truck traffic on State Highway 41 from the Aqueduct to Jersey Avenue is 16 percent in the immediate Project vicinity. Along State Highway 41, the highest peak hour traffic volumes range from 850 to 1,150 vehicles between Interstate 5 and Jersey Avenue. Along this stretch, State Highway 41 operates at LOS C from Interstate 5 to Bernard Avenue, approximately ½ mile to the north-northeast, and LOS A from there to Jersey Avenue with trucks constituting up to 16 percent of total traffic.

Table 3.17-3: Kings County Annual Average Daily Traffic Volumes and Levels of Service

Roadway Segment	Location	Annual Average Daily Traffic (2008)	Percent of Truck Traffic	Peak-Hour Highway Capacity	Peak Hour Traffic	LOS
State Highway 41	Interstate 5 – Bernard Drive	5,500	18%	3,720	1,150	C
State Highway 41	Bernard Drive – Aqueduct	6,600	16%	1,860	850	A
State Highway 41	Aqueduct – Milham Avenue	6,600	16%	1,790	850	A
State Highway 41	Milham Avenue – Nevada Avenue	7,800	16%	1,630	800	A
State Highway 41	Nevada Avenue – Jersey Avenue	7,800	16%	1,840	1,050	A

Source: 2014 Kings County Regional Transportation Plan

Roadways in the area have accident rates that typically range from 0.15 to 1.72 accidents per million vehicle-miles traveled on freeways and multilane facilities, respectively (Caltrans, 1997). The range of accident rates for the roadways in the project vicinity is less than the range of statewide averages for similar roadways (the statewide averages are 0.71 for freeways and 2.27 for multilane facilities) (Caltrans, 1997). In the vicinity of the Project area, planned long- and short-range improvements to the regional transportation system (state highways and regional roadways) include constructing passing lanes between Utica Avenue and Interstate 5.

The proposed Project will impact local transportation through the introduction of additional truck traffic during construction. (Project operations are expected to only contribute minimally to local traffic as it would be limited to trips relating to project inspection and maintenance.) Kings County has weight and load limits or capacity levels for county-maintained roadways. According to Caltrans, the weight and load limitations for state highways apply to county roadways if the county does not specify its own limitations. For this reason, all the local and regional roadways to be used during the construction and operation of the Project are subject to a load limit of 80,000 pounds per truck. This load limitation is specified in the California Vehicle Code Section 35780; the California Street and Highways Code Sections 117 and 660–711; and Title 21 CCR Sections 1411.1 to 1411.6. Vehicles used during project construction that are over-sized, over-weight, over-width, or over-length will require a transportation permit from Kings County and Caltrans. The transporters (i.e., trucking companies) are responsible for obtaining the necessary transportation permits. The Kings County permits are issued by the Public Works Department. The Caltrans permits are typically issued within two to three hours of receipt of the applications.

3.17.2 Regulatory Framework

This section describes laws and regulations at the federal, state, and local level relating to traffic and transportation that may apply to the proposed Project.

Federal Policies and Regulations

Federal Highway Administration Manual on Uniform Traffic Control Devices

The Federal Highway Administration's (FHWA) Manual on Uniform Traffic Control Devices (MUTCD) is a compilation of national standards for all traffic control devices, including road markings, highway signs, and traffic signals. This document, which has been administered by FHWA since 1971, is updated periodically to accommodate the nation's evolving transportation needs and addresses new safety technologies, traffic control tools and traffic management techniques (FHWA, 2014). The most current version of the MUTCD is dated 2009 and was published in the Federal Register on June 13, 2012 (FHWA, 2014).

State Policies and Regulations

California Department of Transportation

Caltrans is responsible for planning, design, construction, and maintenance of all state highways. Caltrans jurisdictional interest extends to improvements to roadways at the interchange ramps serving area freeways, including the interstate highway system. Requests for encroachment permits within the state rights-of-way would be subject to review by Caltrans staff.

Caltrans Transportation Management Plan Guidelines (2015) outline strategies and guidelines that are needed to minimize traffic congestion during road work activities that are planned along existing Caltrans facilities. The guidelines established in this document identify processes, roles, and responsibilities for all planned construction, maintenance, and permit activities (Caltrans, 2015). Incorporation of these strategies in project construction documents and implementation of the strategies are expected to help reduce congestion and manage traffic impacts near work areas.

Local Policies and Regulations

Kings County General Plan Circulation Element

The Circulation Element of the Kings County General Plan (Kings County, 2010a) contains the following relevant policies and implementation measures:

C OBJECTIVE A1.3: Maintain an adequate Level of Service operation for County roadways and ensure proper maintenance occurs along critical routes for emergency response vehicles.

> *C Policy A1.3.1:* Maintain and manage County roadway systems to maintain a minimum Level of Service Standard "D" or better on all major roadways and arterial intersections.
>
> *C Policy A1.3.2:* Require proposed developments that have the potential to generate 100 peak hour trips or more to conduct a traffic impact study that follows the most recent methodology outlined in Caltrans Guide to the Preparation of Traffic Impact Studies.

3.17.3 Impact Analysis

Methodology for Analysis

This section evaluates whether construction and O&M of the facilities associated with the proposed Project could result in significant impacts related to local transportation and traffic. The analysis is based on a review of various plans, policies, and reports, as well as evaluations of aerial imagery and visits to the Project area.

Thresholds of Significance

A traffic impact would be considered significant if the proposed Project would:

- Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of a circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit.
- Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roadways or highways.
- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
- Result in inadequate emergency access.
- Conflict with adopted policies regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to activities associated with the proposed Project are identified below along with a supporting rationale as to why further consideration is unnecessary and a no-impact determination is appropriate.

- *Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks* – Activities related to construction and O&M of the Project would not interfere with air traffic; they would neither require an alteration of air traffic patterns nor result in an increase in air traffic levels. There are a few existing private airstrips near the Project area, but Project construction and O&M would not affect air traffic by either increasing traffic levels, requiring a change to air traffic patterns or alter the airports.

Impacts and Mitigation Measures

This section discusses potential transportation-related impacts that could result from the construction and O&M of the proposed Project. Mitigation measures are identified where appropriate.

Impact TRA-1 Increases In Traffic and Conflicts with Traffic-Related Policies

Implementation of the Project would increase traffic in the Project area, but would not substantially affect traffic operations and increase levels of service past existing levels of service or Kings County standards. Table 3.17-4 shows the anticipated Annual Average Daily Traffic and LOS for roadway segments in the Project vicinity as projected in 2035 by Kings County (Kings County, 2014)

Table 3.17-4: Projected Annual Average Daily Traffic Volumes and Levels of Service

Roadway Segment	Limits	2006		2035	
		AADT	LOS	AADT	LOS
Interstate 5	Kern Co. Line – Utica Avenue	31,500	B	49,420	C
Interstate 5	Utica Avenue – State Highway 41	32,500	B	52,990	C
Interstate 5	State Highway 41 – Fresno Co. Line	34,500	B	48,490	C
State Highway 41	Interstate 5 – Bernard Drive	9,500	B	13,940	D
State Highway 41	Bernard Drive – Quail Avenue	7,100	C	13,260	C
State Highway 41	Quail Avenue – Nevada Avenue	8,300	C	10,840	C
State Highway 41	Nevada Avenue – Jackson Avenue	8,500	C	13,370	C

Source: General Plan. Chapter 5: Circulation Element, 2010

Construction

Project construction activities would involve, among other activities, site grading, excavation, and building/improving proposed Project facilities. Those activities would temporarily affect traffic flow on segments of the Project area's roadway network by increasing traffic volumes on roads that provide access to the Project area. Up to approximately 13.9 million cubic yards of soils would be moved to construct the reservoir embankments, but it is anticipated that all soil materials would be managed on-site, with reservoir excavation and levee construction being a "balanced" cut and fill operation. As such, no significant imports or exports of soil to/from the Project area is anticipated. However, construction activity would generate vehicle trips for deliveries of equipment and materials, and workers would commute via car from their homes or temporary residences to the Project site. This could result in increased levels of traffic on local roadways.

Equipment and construction material deliveries would access the Project area via Interstate 5, State Highway 41 and other local roads. Deliveries to Kettleman Reservoir would enter the site at Quebec and Racine Avenues, while deliveries for other Project facilities would enter the site either at 25th Avenue or near Nevada Avenue. Project-related truck traffic that would occur during the peak commute hours (7:00 AM to 9:00 AM, and 4:00 PM to 6:00 PM) could result in decreased LOS and longer delays at local intersections.

Road closure is anticipated along 25th Avenue during construction of the Aqueduct Intertie pipe alignment. Parts of Omaha Avenue, 23rd Avenue, and 21st Avenue may also be closed during construction of the

proposed Kettleman Canal and reservoir levees. Quebec and Racine Avenues cross through the proposed Kettleman Reservoir site and may be closed partly during construction as levees are constructed adjacent to the roadways. If access can be provided along the roadway shoulders and adjacent property, only partial road closures with appropriate traffic control would be required. Partial or complete closures of roadways could cause a degradation of LOS below acceptable standards, cause roadway congestion, and potentially create roadway hazards.

Truck traffic would be coordinated to avoid peak commute hours and to maintain the designated minimum threshold LOS "E" for urban areas and LOS "D" for rural areas in the County. With this coordination, Project-related construction traffic would not decrease the performance or safety of existing facilities in the area. Since existing traffic volumes on these roadways are generally low, and impacts would be short-term in any particular location within the Project area, the traffic generated by the Project is unlikely to reduce LOS below acceptable levels and impair traffic circulation.

Impacts would be considered potentially significant. Implementation of Mitigation Measure TRA-1: Implement a Construction Management Plan to Minimize Interference with Traffic and Emergency Response Hazards, would reduce impacts to a level that is less than significant.

Operations & Maintenance

Two existing county roads, Quebec Avenue and Racine Avenue, run east to west through the proposed reservoir site. These two roads, and the canals adjacent to them, would be preserved and bridges or siphon crossings would be constructed to accommodate road crossings over/under the Kettleman Canal. The existing canals would be siphoned below the Kettleman Canal through pipelines. As such, existing roads in the Project area would be preserved and remain in use after Project implementation. Operational effects would be limited to a very small number of infrequent vehicle trips for inspection and maintenance of the facilities. For this reason, the Project's operational period impact on traffic and circulation would be considered less than significant.

In summary, although the proposed Project would increase traffic levels during construction, these impacts would be minimal and temporary, and neither Project construction nor operation would degrade LOS levels below County standards.

Significance Determination Before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure TRA-1: Implement a Traffic Management Plan to Minimize Interference with Traffic and Emergency Response Hazards (Alternatives 1, 2 and 3)

A Traffic Management Plan (TMP) will be prepared and implemented in consultation with the County. Semitropic will be responsible for ensuring that the plan is adequately developed and implemented. Semitropic will provide the TMP to the Kings County Department of Public Works and Caltrans. The TMP will include recommended traffic-control and traffic-reduction measures as identified in the Transportation Management Plan Guidelines issued by the Division of Traffic Operations Office of System Management Operations (Caltrans 2009). Semitropic will require all traffic-control or traffic-reduction measures described in the TMP to be implemented. In addition, to the extent feasible, construction-related traffic and any temporary road closures shall be scheduled during non-peak traffic periods.

The measures included in the TMP shall be consistent with any applicable guidelines outlined in the Standard Specifications for Public Works Construction, the U.S. Department of Transportation's

Manual on Uniform Traffic Control Devices, and the Work Area Traffic Control Handbook. The plan will include the following items:

- Definition of location and timing of any temporary lane or roadway closures;
- Identification and provision for circumstances requiring the use of temporary traffic control measures, such as flag persons, warning signs, lights, barricades, and cones to provide safe work areas in the vicinity of the Project area or along the haul routes, including for narrow roadway segments, and to warn, control, protect, and expedite vehicular, bicycle, and pedestrian traffic and access by emergency responders;
- Implementation of comprehensive traffic control measures, including scheduling of major truck trips and deliveries to avoid peak-hour traffic, placement of detour signs (if required), lane closure procedures (if required), flaggers (if required), placement of cones for drivers, and designated construction access routes and access points;
- Notification to adjacent property owners, transit agencies and public safety personnel regarding when major deliveries, detours, and lane closures will occur;
- Measures to address the potential for construction-related traffic to impede emergency response vehicles and a specific training and information program for construction workers to ensure awareness of emergency procedures for project-related accidents;
- Identification of haul routes for movement of construction vehicles that will minimize impacts on vehicular and pedestrian traffic and circulation and safety, and provision for monitoring surface streets used for haul routes so that any damage and debris attributable to the haul trucks can be identified and corrected by the Partner Agencies in coordination with the construction contractor;
- Consideration of other projects in the vicinity that could also affect the same roadways as the project;
- Development of a process for responding to and tracking complaints pertaining to construction activity, including identification of an onsite complaint manager; and
- Documentation of road pavement conditions for all routes that would be used by construction vehicles both before and after project construction. Roads damaged by construction vehicles will be repaired to the level at which they existed before project construction.

Significance Determination After Mitigation

Less than significant.

Impact TRA-2 Increases in Hazards due to Design Feature

As described in the section above, the Project's effect on traffic during its operational phase would be minimal, but the road network at the Project area and its vicinity would temporarily absorb a greater number of Project-related vehicle traffic during the construction period. However, the Project would not include any design features (such as sharp curves or dangerous intersections) that would increase traffic and circulation hazards at the site or its vicinity. As such, the Project's construction and subsequent operations would not result in any increases in hazards.

Significance Determination Before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact TRA-3 Impacts to Emergency Access

All Facilities

Project construction and O&M activities would not affect emergency access to and from the Project area and its vicinity. As discussed in the Impact TRA-1 section above, traffic is not expected to significantly increase due to the Project, neither during the construction or operations periods. Although road closures during construction may occur, the Project area is located away from main roads and alternative transportation patterns exist. While the Project's construction would not interfere with emergency access to other sites or neighborhoods in the vicinity, it may potentially result in delays, as such, the Project's impact on emergency access could be considered significant. However, development of a traffic management plan, in coordinate with regional emergency responders, would ensure that all parties are aware of potential road closures and/or delays, and implementation of such a plan during construction would reduce potential impacts to a less than significant level.

Significance Determination Before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure TRA-1: Traffic Management Plan

See description for TRA-1: Traffic Management Plan.

Significance Determination After Mitigation

Less than significant.

Impact TRA-4 Conflicts with Alternative Transportation

Due to the rural, agricultural nature of the Project area, modes of alternative transportation in the area are limited to public transportation. Though bicyclists and pedestrians can access the area, there are no officially designated facilities for their use, such as bicycle lanes and sidewalks.

Construction and Operations & Maintenance

As discussed in the Project setting, all Kings County roads (unless otherwise noted) are designated truck routes, so truck movement along roadways during the construction phase would be in accordance with Kings County roadways' intended use. The movement of Project-related vehicle trips during construction would be temporary and would be subject to a County-approved Traffic Management Plan (**Mitigation Measure TRA-1**) which would ensure that the Project would not interfere with the normal operation of public transportation services. The Project's effect on public transit facilities would be less than significant.

Although construction and O&M of the proposed Project would result in additional on-site workers, the increase in the number of worker trips that would use public transit is not anticipated to occur or would be negligible. The primary reason that Project workers would not use public transportation is the lack of easy access to the site via that mode of transportation. In addition, parking in the proposed Project area is free and readily available. Consequently, it is not anticipated that additional demand on local transit services would occur as a result of Project implementation. The Project's impact would be less than significant.

Significance Determination Before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Cumulative Impacts

The geographic scope of cumulative impacts related to transportation and traffic includes the Project construction area footprint and surrounding roadways. Several projects are under construction or are in the planning phases in the vicinity of the proposed Project's facilities, which makes them relevant to an analysis of the Project's cumulative impacts. The relevant other projects include:

- Quay Valley Community Development - a new 7,175-acre community to be developed in south Kings County.
- Kettleman Hills Facility Expansion - expanding the existing B-18 Landfill and construct a new B-20 Landfill for hazardous waste and designated waste disposal.
- Kettleman City Surface Water Treatment Plant and Commercial Water Storage Tanks (Treatment Plant) – construction of a new surface water treatment plant to treat surface water for potable supply.
- Southwest Groundwater Banking Project – development of a project to divert and store floodwater from the Kings River and local stormwater.
- JID Distributed Recharge Bypass and Lassen Projects – improvement to and construction of recharge facilities to divert and store floodwater from the Kings River.
- Terranova On-Farm Flood Capture and McMullin Recharge Site – improvements to and construction of facilities to divert floodwater from the Kings River for recharge on existing farm lands.

Simultaneous construction of all of these projects would collectively adversely affect the same roadways or other transportation infrastructure.

Given the construction timing and locations of the projects listed above, the overlapping of construction activity among the various projects is expected to be minimal. The majority of vehicle trips attributable to the proposed Project would occur during Project construction, and would consist of Project materials deliveries and workers commuting to the Project area. The number of Project-related vehicle trips would be minimal overall, given the relatively small number of workers, the extended period of construction, the limited importation of materials to the Project area, the lack of soil importation or exportation, and because vehicle trips would be coordinated to avoid peak commute hours. With the conclusion of construction activities and onset of the Project's operational period, Project-related vehicle trips are expected to be even more limited and infrequent, given that the Project facilities are expected to be largely automated and would only operate, on average, three out of ten years, for periods lasting from 15 to 140 days. Aside from periodic inspection and maintenance, Project operations would not generate vehicle traffic. Therefore, the Project's effects on traffic and circulation would not be cumulatively considerable.

3.18 Utilities

This section presents the physical and regulatory setting for utilities at the Project site. The impact analysis considers the potential for the Project to exceed the existing capacity of wastewater, water, storm drainage, solid waste, and energy (electrical and natural gas) services.

3.18.1 Environmental Setting

The proposed Project is located in unincorporated Kings County, outside of the jurisdictional areas of the nearby cities. The following sections describe the environmental setting for utilities within the Project area. For water supply, multiple water and irrigation districts provide services in the Project area. Wastewater services in the Project area is served by individual septic systems. For storm water runoff management, the County provides necessary services in the Project area. For landfill capacity, the region is served by several landfills, including a composting facility. Electrical and gas service in the Project area is provided by PG&E. For disruption of utilities, the Project area is limited to the project vicinity, where utilities could require relocation and services could be disrupted.

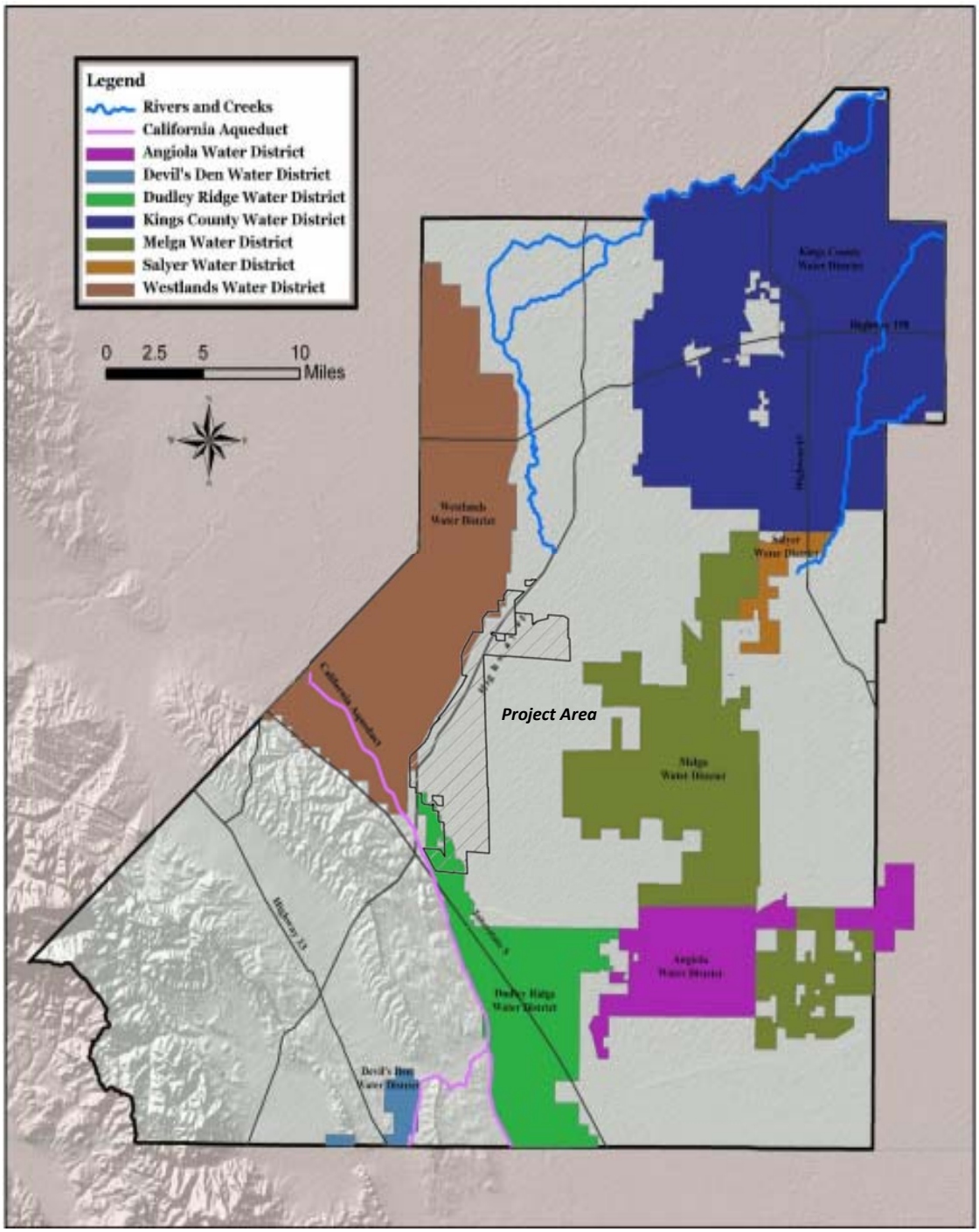
Water Supply

Water supplies in the Project area originate from snow and watershed runoff in the Sierra Nevada Mountain Range to the east and from local groundwater. Local rivers, including the Kings, Kern, Kaweah and Tulare Rivers, supply much of the surface water used for irrigation and serve to assist in groundwater recharge efforts that support groundwater pumping for agriculture, domestic and industrial uses (Kings Basin IRWMP, 2012). In the Project area, the Kings River is the major source of surface waters.

Water supplies in the Project area are served by a number of water districts, irrigation districts, reclamation districts and community services districts in addition to private wells. Local potable water in Kings County is served by the Cities of Avenal, Corcoran, Hanford and Lemoore, in addition to the Armona, Home Garden and Kettleman City Community Services Districts (CSD). The closes census-designated place to the Project area is Kettleman City. Potable water to Kettleman City is provided by Kettleman City CSD using two groundwater wells with wellhead treatment for benzene. This water treatment facility provides support services to 2,632 customers (Kings County, 2010d).

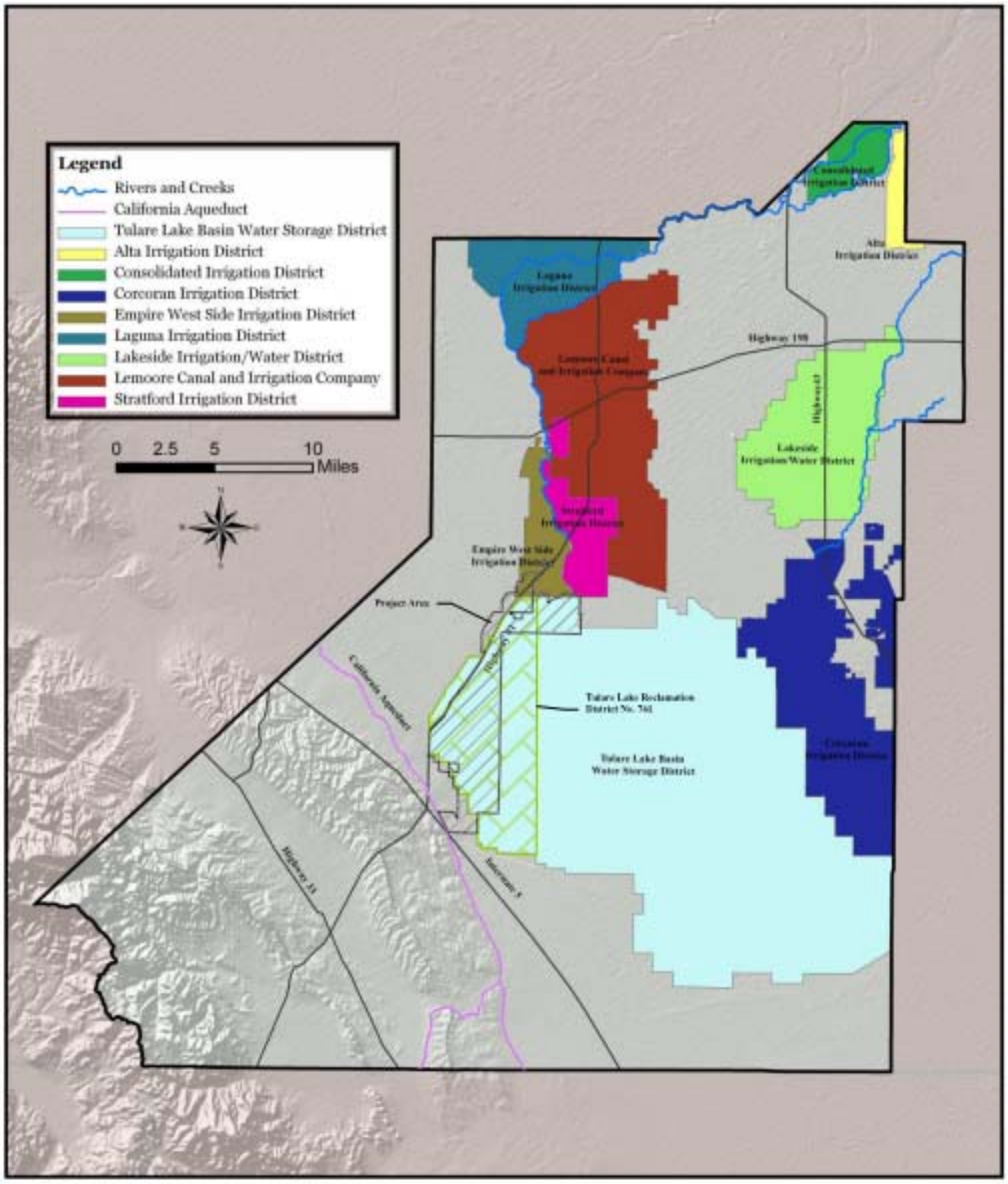
Other water supplies in Kings County are served by the Angiola Water District, Atwell Island Water District, Devil's Den Water District, Dudley Ridge Water District, Green Valley Water District, Kings County Water District, Melga Water District, Salyer Water District and Westlands Water District (**Figure 3.18-1)**; of these, Angiola Water District, Dudley Ridge Water District, Melga Water District and Westlands Water District are in or adjacent to the Project area. Local agricultural supplies are provided by Tulare Lake Basin Water Storage District, Tulare Lake Reclamation District No. 761, Alta Irrigation District, Consolidated Irrigation District, Corcoran Irrigation District, Empire-West Side Irrigation District, Laguna Irrigation District, Lakeside Irrigation/Water District, Lemoore Canal and Irrigation Company, and Stratford Irrigation District (**Figure 3.18- 2**). Of these, only Tulare Lake Basin Water Storage District is in the Project area. In general, potable water supplies are treated at the source by individual users (Kings County, 2010d).

Figure 3.18-1: Water Supplies in Kings County



Source: Kings County General Plan, Resource Conservation Element, 2010.

Figure 3.18- 2: Irrigation and Water Storage Districts



Source: Kings County General Plan, Resource Conservation Element, 2010.

Tulare Lake Basin Water Storage District (TLWSD) is approximately 190,000 acres in size, of which approximately 170,000 acres are irrigated, with boundaries that generally follow the rim of the Tulare Lake Bed. Sources of water supply for TLWSD are primarily SWP water and Kings River surface water, with water diverted at Empire Weir No. 2 pool at the terminus of the South Fork of the Kings River into one of two lateral canals (Lateral A or Lateral B). TLWSD only manages the surface water to its boundaries where it is measured and discharged to internal irrigation systems. Groundwater supplies are privately owned and managed (TLWSD District, 2013).

Wastewater/Sewer

Wastewater collection, treatment and disposal systems are regulated by the CVRWQCB. Local government and special districts own and operate collection systems (sewers) and wastewater treatment plants, though none of these facilities are located in the Project area. Residents in rural areas that are not served by sewers (such as in the Project vicinity) use existing individually-managed septic systems. Septic systems are managed by the Kings County Building Department per County building ordinances relating to septic requirements.

Storm water

The topography within Kings County is relative flat and does not contain natural drainage channels. The Project area is located within the Tulare Lake bed and has historically been the terminus of storm water runoff in the area. The Project area does contain irrigation canals; however, these canals are not used for the conveyance or disposal of storm water runoff with two exceptions (Kings County, 2012a).

Due to the topography, the primary method of storm water collection and disposal is to use retention basins excavated below ground level or to use remnants of sloughs that had once served as natural drainages. Drainage from developed areas is commonly directed to street curbs and gutters. The drainage is conveyed along the surface to inlets that direct the water to storm drain pipelines, and ultimately to retention basins (Kings County, 2012a). The Kings County storm water system is primarily associated with runoff from County roads. The system consists of roadside ditches serving to collect and contain runoff. There is a limited amount of storm water collection pipelines and detention basins within the County; these pipelines systems are located primarily in the community of Armona and in several County service areas (Kings County, 2012a).

Solid Waste

Solid waste, recyclables, and yard trimmings within and near the Project area are managed by six facilities within Kings County – two landfill facilities and four recycling facilities:

- Chemical Waste Management, Inc.
- Avenal Regional Landfill
- Kings Waste and Recycling Authority (KWRA) Materials Recovery Facility (MRF)
- Kochergen Farms Composting
- Tulare Lake Composting
- Recycle Depot C&D

The KWRA MRF is a large-scale recovery facility located at 7803 Hanford-Armona Road, in Hanford (to the northeast of the Project area). The MRF has a maximum permitted capacity of 800 tons/day and focuses on recycling and reuse of materials to divert waste from entering the landfills. KWRA serves all of Kings County's unincorporated areas in addition to the Cities of Corcoran, Hanford and Lemoore. Municipal waste generated within these areas are first directed to the KWRA facility, and then transferred to the Chemical Waste Management Kettleman Hills Facility (CalRecycle, 2016).

The Tulare Lake Composting facility creates compost but accepts agricultural wastes, green materials, manure, sludge (biosolids) and wood waste. This facility has a permitted maximum capacity of 912,000 CY and is located at N of Utica and 23rd Avenue in Kettleman City, adjacent to the proposed Kettleman Reservoir site (CalRecycle, 2016).

Energy

Californians 2016 total system electric generation was 290,567 gigawatt-hours (GWH) of electricity, supplied by several sources (CEC, 2017). In 2016, the California electricity mix included natural gas (36.5 percent), coal (4.1 percent), large hydroelectric plants (10.2 percent), and nuclear (9.2 percent). Renewable energy resources, such as wind, solar, geothermal, biomass, and small hydroelectric facilities, generated approximately 25.5 percent of California's supplies (CEC, 2017). California's generation of electricity with renewable sources is continuing to grow, partly due to the State's cap and trade system for carbon credits and due to public demand.

California's energy use per person has remained stable for more than 30 years while the national average has steadily grown (CEC, 2009b). However, CEC estimates that California's energy consumption will grow by 1.2 percent per year from 2010 to 2018, with peak demand growing an average of 1.3 percent annually over the same period (CEC, 2009b). Further, additional energy efficiency measures are needed to meet the AB 32 GHG reduction goal of reducing statewide GHG emissions to 1990 levels by 2020 (see *Section 3.8 Greenhouse Gas Emissions*, for a discussion of AB 32).

In 2002, California established its Renewable Portfolio Standard program with the goal of increasing the annual percentage of renewable energy in the state's electricity mix by the equivalent of at least 1 percent of sales, with an aggregate total of 20 percent by 2017. The California Public Utilities Commission (CPUC) subsequently accelerated that goal to 2010 for retail sellers of electricity (Public Utilities Code Section 399.15(b)(1)). Governor Schwarzenegger signed Executive Order S-14-08 in 2008, increasing the target to 33 percent renewable energy by 2020. In 2016, the CPUC reported that, in 2015, the State's three investor-owned utilities collectively served 27.6 percent of their 2015 retail electricity sales with renewable resources (CPUC, 2017). PG&E, the provider of electricity and natural gas service in the Project area, uses a comprehensive energy strategy that relies on expansion of customer energy efficiency and demand-side management programs to meet its customers' future power needs in ways that are consistent with the state's Energy Action Plan, described below (PG&E, 2008). The strategy also includes securing additional renewable power resources before seeking to meet customer energy needs through efficient traditional generation sources.

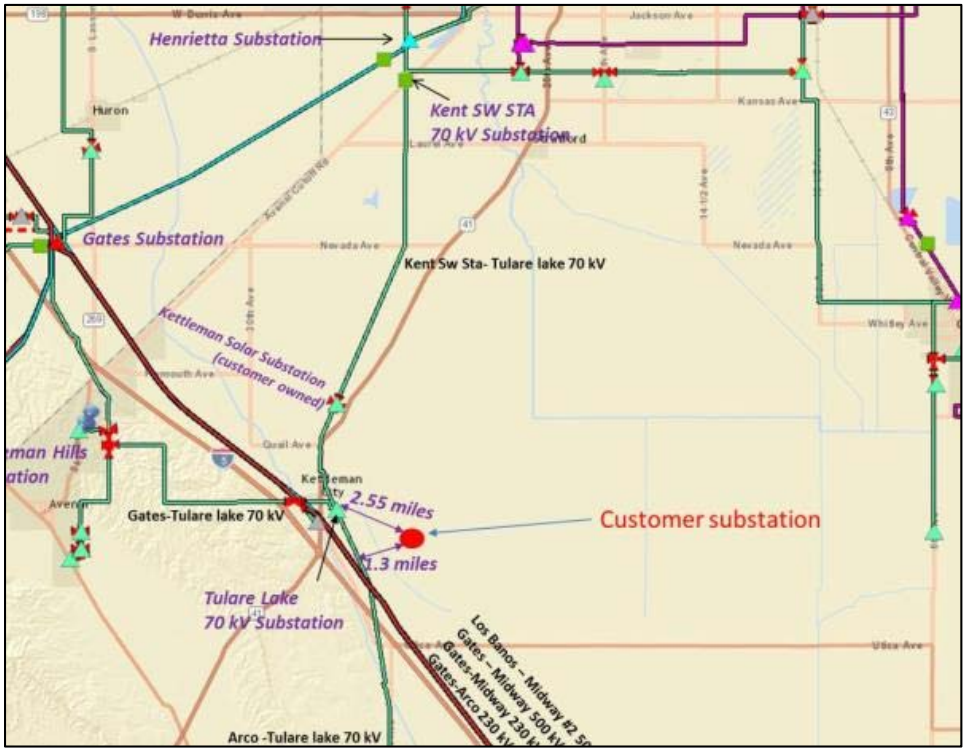
In 2014, PG&E's retail customers purchased 74,547 GWH of electricity. Of that amount, 22,868 GWH were generated by PG&E's own natural gas, hydroelectric, and nuclear facilities as well as small amounts of fuel oil, diesel, and solar energy. PG&E purchased the remainder of the electricity under contracts or from the open market. In total, the 2015 PG&E power mix included natural gas (25 percent), large hydroelectric plants (6 percent), nuclear (23 percent), renewable resources (30 percent), and other/unspecified (17 percent). Renewable resources used include geothermal (5 percent), biomass and waste (4 percent), small hydroelectric (1 percent), wind (8 percent), and solar (11 percent). In 2015, 29.5 percent of PG&E's delivered electricity mix came from Renewable Portfolio Standard-eligible renewable

resources. PG&E continues to pursue avenues for increasing the procurement of eligible renewable energy resources.

Western Area Power Administration (WAPA), one of four power marketing administrations within the U.S. Department of Energy (USDOE), delivers cost-based hydroelectric power and related services within a 15-state region of the central and western U.S, including the project site (WAPA, 2010). The WAPA transmission system carries electricity from 57 power plants operated by the Bureau of Reclamation, USACE and the International Boundary and Water Commission. Together, these plants have an installed capacity of 10,489 MW.

Electrical power served by PG&E in the Project area is generated by power plants located near Lemoore, Hanford and Avenal, and at hydroelectric power generations facilities on the North Fork of the Kings River. There is one electrical generation facility in the vicinity of the Project area; this facility is PG&E's EE K Solar 1 facility located in Kettleman City (CEC, 2016b). Additionally, PG&E owns and operates two substations in Kettleman City, the Kent SW Substation and the Tulare Lake Substation, and operates a 70-kV electrical transmission line from Kettleman City to Henrietta that parallels State Highway 41 and 25th Avenue (URS Corporation, 2001). PG&E also owns and operates two gas transmission pipelines that would be crossed by the Aqueduct Intertie. There is also a natural gas pipeline adjacent to the SWP.

Figure 3.18-3: PG&E Electrical Facilities in Project Area



Source: *Preliminary Engineering Study Plan, Retail Large Load Interconnection – New Load, Semitropic Water Storage District Tulare Lake Storage and Floodwater Protection Project* (PG&E, 2017)

3.18.2 Regulatory Framework

Federal Policies and Regulations

National Energy Policy

The National Energy Policy was established by the NEPDG in 2001 to help the private sector and, as appropriate, State and local governments promote dependable, affordable, and environmentally sound production and distribution of energy for the future (NEPDG, 2001). Modernizing energy conservation and energy infrastructure, increasing energy supplies, increasing energy security, and protecting the environment are all goals of the policy.

National Energy Conservation Policy Act

The National Energy Conservation Policy Act serves as the underlying authority for federal energy management goals and requirements. Signed into law in 1978, it is regularly updated and amended by subsequent laws and regulations. This act is the foundation of most federal energy requirements.

State Policies and Regulations

The Tulare Lake Storage and Floodwater Protection Project is within the jurisdiction of the CVRWQCB, which governs many of the regulations associated with water supply, wastewater, and storm drainage. CVRWQCBs administer regulations related to discharges under the Federal Water Pollution Control Act of 1972 as amended (the CWA) and the Porter-Cologne Water Quality Control Act. Additional discussion of these regulations is provided in *Section 3.10, Hydrology and Water Quality*.

California Energy Commission

The CEC regulates the provision of natural gas and electricity within the state. The CEC is the State's primary energy policy and planning agency, and holds five primary responsibilities, including forecasting future energy needs and keeping historical energy data, licensing thermal power plants 50 megawatts or larger, promoting energy efficiency through appliance and building standards, developing energy technologies and supporting renewable energy, and planning for and directing the State's response to energy emergencies.

California Integrated Waste Management Act

The California Integrated Waste Management Act of 1989 (Assembly Bill 939) established an integrated waste management framework that consists of the following order of importance: source reduction, recycling, composting, and land disposal of solid waste. Each county is required to prepare and submit an Integrated Waste Management Plan for expected solid waste generation within the county to the California Integrated Waste Management Board (CIWMB). The Act also requires each city to prepare a Source Reduction and Recycling Element for achieving a solid waste diversion goal of 25 percent by January 1, 1995, and 50 percent by January 1, 2000.

California Public Utilities Commission

The CPUC regulates Investor-Owned Utilities, including those that offer electric, natural gas, steam, and petroleum service to consumers. CPUC regulates both electric and natural gas rates and services provided by these utilities, including in-state transportation over the utilities' transmission and distribution pipeline systems, storage, procurement, metering and billing. Natural gas regulations are found in General Orders

58, 94, 96, and 112, while electrical distribution regulations are found in General Orders 95, 128, 131, 165, and 166.

CalRecycle (formerly California Integrated Waste Management Board)

CalRecycle governs solid waste regulations on the state level, delegating local permitting, enforcement, and inspection responsibilities to Local Enforcement Agencies (LEA). Regulations authored by CalRecycle (Title 14) were integrated with related regulations adopted by the SWRCB pertaining to landfills (Title 23, Chapter 15) to form CCR Title 27.

California Energy Action Plan

California's Energy Action Plan II is the state's principal energy planning and policy document (CPUC and CEC, 2005). The plan describes a coordinated implementation plan for state energy policies and refines and strengthens California's original Energy Action Plan I published in 2003. California Energy Action Plan II identifies specific action areas to ensure that California's energy is adequate, affordable, technologically advanced, and environmentally sound. It adopts a loading order of preferred energy resources to meet the state's needs and reduce reliance on natural gas and other fossil fuels, also important for achieving GHG emission reductions from the electricity sector.

Energy efficiency and demand response are considered the first ways to meet the energy needs of California's growing population. Renewable energy and distributed generation are considered the best ways on the supply side. To the extent that energy efficiency, demand response, renewable resources, and distributed generation are unable to satisfy increasing energy and capacity needs, CEC supports clean and efficient fossil fuel-fired generation to meet California's energy needs. The 2008 Energy Action Plan Update provides a status update to the 2005 Energy Action Plan II and continues the goals of the original California Energy Action Plan (CPUC and CEC, 2008).

Combined Heat and Power Systems

Several state policies have been enacted to encourage the use of combined heat and power systems, a form of distributed generation, as a way of meeting the state's climate action goals, while increasing reliability. Two that apply to systems the size of the PGS at the MWWTP include:

- AB 1613 (Waste Heat and Carbon Emissions Reduction Act) encourages the development of new combined heat and power systems in California with generating capacities of up to 20 MW. This bill requires CEC to establish policies and procedures for the purchase of electricity from eligible combined heat and power systems.
- The Climate Action Plan (also discussed in Section 3.8, Greenhouse Gas Emissions), sets a target of 4,000 MW of combined heat and power systems that would displace 30,000 GWH of demand from other power generation sources.

California Bioenergy Action Plan

The California Bioenergy Action Plan (Bioenergy Interagency Working Group 2006) proposed targets for biodiesel fuel use in California of nearly 1 billion gasoline gallon equivalents in 2010, 1.6 billion in 2020, and 2 billion in 2050. The plan also called for the state to produce a minimum of 20 percent of its biofuels within California by 2010, 40 percent by 2020, and 75 percent by 2050. These goals were formalized by the Governor's Executive Order S-06-06.

State Alternatives Fuel Plan

The State Alternatives Fuel Plan (CARB and CEC, 2007) presents strategies and steps that California must take to increase the use of alternative fuels without adversely affecting air quality, water quality, or causing negative health effects. The plan recommends alternative fuel targets of 9 percent in 2012, 11 percent in 2017, and 26 percent by 2022. The plan also presents a 2050 Vision that extends the plan outcomes and presents a transportation future that greatly reduces the energy needed for transportation, provides energy through a diverse set of transportation fuels, eliminates overdependency on oil, and achieves an 80 percent reduction in GHG emissions. With these goals, more than 4 billion gasoline gallon equivalents (20 percent) would be displaced by alternative fuels in 2020. CEC estimates that by 2050, alternative fuels could provide more than half of the energy needed to power California's transportation system.

Building Energy Efficiency Standards

The Energy Efficiency Standards for Residential and Nonresidential Buildings (CCR Title 24 Part 6) were established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. CEC adopted an update in 2008, and the new standards went into effect on January 1, 2010. The new standards require, on average, a 15 percent increase in energy savings compared with the 2005 Building Efficiency Standards.

Local Policies and Regulations

Kings County Board of Supervisors

The Kings County Board of Supervisors produced the Kings County Countywide Integrated Waste Management Plan (EBA Wastechnologies, 1995) which outlines countywide waste management programs to reduce the amount of waste sent to landfills by 25% by 1995 and by 50% by 2000. The Kings County Department of Environmental Health Services (KCEHS) is the LEA for solid waste regulations and has local permitting, enforcement, and inspection responsibilities. The Kings County Waste and Recycling Authority (KCWRA, also known as the Kings Waste and Recycling Authority or KCWA) is a joint power authority between the Cities of Hanford, Lemoore, Corcoran and the unincorporated parts of Kings County formed to deal with waste disposal and State mandate for recycling.

Kings County Countywide Integrated Waste Management Plan

The Kings County *Countywide Integrated Waste Management Plan* (EBA Wastechnologies, 1995) is a primary tool for designing waste reduction programs that are countywide in scope and addresses the county's landfill needs in a comprehensive way. Waste reduction and disposal facilities that require Solid Waste Facility Permits must conform with the policies contained in this Plan. The Plan incorporates planning documents known as Source Reduction and Recycling Elements (SRREs) and Household Hazardous Waste Elements (HHWEs), and contains the following objectives and policies regarding waste reduction that are applicable to the Tulare Lake Storage and Floodwater Protection Project:

- *Objective A.1* – The County and the Cities will achieve a 25 percent diversion of wastes being disposed of at County landfills by 1995.
- *Objective A.2* – The County and the Cities will achieve a 50 percent diversion of wastes being disposed of at County landfills by 2000.
    - *Policy A.2* – The County and the Cities will continue to encourage and support the use of waste minimization practices for business, government agencies and the public by distributing information on the availability of waste minimization options.

  - *Policy A.13* – The County and the Cities and/or KCWMA will promote recycling of construction and demolition debris

- *Objective B.1* – The KCWMA will construct a Materials Recovery Facility (MRF) by 1995 to separate recyclable materials. The MRF should reduce total county landfill disposal needs by 50% in the year 2000.
- *Objective B.2* – The KCWMA will construct a new landfill at the Mustang Hill Site to provide disposal capacity for its jurisdictions in the long-term (40 years).
  - *Policy B.1* – The KCWMA will promote awareness of waste disposal and diversion options in the business community through advisory committees or the Local Task Force (LTF).
  - *Policy B.2* – The KCWMA will finance the new landfill at the Mustang Hill Site and may contract for private operation of the facility.
- *Objective F.1* – The County and the Cities will achieve a 25 percent diversion of wastes being disposed of in county landfills by 1995.
- *Objective F.1* – The County and the Cities will achieve a 50 percent diversion of wastes being disposed of in county landfills by 2000.

Kings County Code of Ordinances

Chapter 13 of the Kings County Code of Ordinances covers Solid Waste Collection and Disposal. These ordinances require the separation of wastes and recycling of such whenever possible.

3.18.3 Impact Analysis

Methodology for Analysis

Potential impacts on utilities are analyzed based on the potential for the Tulare Lake Storage and Floodwater Protection Project to affect the facilities described above in *Section 3.17.1, Environmental Setting* during construction or operation.

Thresholds of Significance

For the purposes of this analysis, an impact to utilities would be significant if the Project would:

- Exceed wastewater treatment requirements of the applicable RWQCB;
- Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Have insufficient water supplies available to serve the project from existing entitlements and resources, thus requiring new or expanded entitlements;
- Result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments;
- Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs;
- Not comply with federal, state, and local statutes and regulations related to solid waste; or
- Result in disruption of utilities.
- Result in a substantial increase in overall or per capita energy consumption.

- Conflict with applicable energy efficiency policies or standards.

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to actions associated with the Project are identified below along with a supporting rationale as to why further consideration is unnecessary and a no impact determination is appropriate.

- *Result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments* – The Project would not depend on an existing provider for wastewater services and would use a portable disposal system (e.g. portapotty) to meet any wastewater needs. The Project thus would not generate need for the use of existing or construction of new wastewater treatment capacity.

Impacts and Mitigation Measures

Impact UTL-1 Exceed Wastewater Treatment Requirements of the Central Valley Regional Water Quality Control Board

Construction

All Facilities

Construction of the Project would have minimal effect on local wastewater treatment systems. Construction wash water would be contained and disposed of in accordance with the Project's SWPPP and managed using construction best management practices. As such, the potential for exceedance of wastewater treatment requirements is less than significant.

Operations & Maintenance

All Facilities

Operation of the Project would be conducted remotely with periodic staff visits for inspection and maintenance. As such, no wastewater treatment facilities would be constructed as part of the Project and operational impacts related to wastewater treatment would not be significant.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact UTL-2 Require or Result in the Construction of New Water or Wastewater Treatment Facilities or Expansion of Existing Facilities

Construction

All Facilities

Construction of the Project would have minimal effect on local water supplies. Additional water demands during construction of the Project would be only a small, temporary increment as compared to existing water usage in the County. Similarly, construction of the Project would have minimal, if any, effect on local wastewater treatment facilities as temporary wastewater collection facilities would be used during construction. As previously noted, construction wash water would be contained and disposed of at an off-site location in accordance with the Project's SWPPP. As such, Project construction is not anticipated to

require or result in the construction or expansion of new water or wastewater treatment facilities, and construction impacts would be less than significant.

Operations & Maintenance

All Facilities

Operation of the Project would be conducted remotely with periodic site visits for inspection and maintenance. No water or wastewater system connections would be constructed as part of the proposed Project, and therefore, no new water or wastewater treatment facilities would be required nor would existing facilities need to be expanded. As such, operational impacts related to water and/or wastewater treatment facilities would not be significant.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact UTL-3 Require Construction of New Storm Water Drainage Facilities or Expansion of Existing Facilities

Construction

All Facilities

Construction of the Project would create minimal additional storm water runoff as the Project, once constructed, would have minimal impervious services relative to the overall Project size. As previously noted, a Project-specific SWPPP would be developed and implemented during Project construction, and construction best management practices and controls would be implemented to prevent surface waters and runoff from flowing through the work area and transporting soil or pollutants off site. Implementation of these standard measures at the Project construction sites would reduce the potential for excess storm water drainage or the need for new off-site storm water drainage facilities.

Operations & Maintenance

All Facilities

The proposed Project may result in the development of new roads for accessing Project facilities; however, these roads would be constructed of crushed gravel. Additionally, these roads would be designed per County building codes and ordinances to ensure the clearance of storm water runoff in a safe manner and to minimize the potential for erosion. It is anticipated that the new roads would drain to grassy swales or other vegetative areas adjacent to the roadway, and that new storm water collection facilities would not be required.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact UTL-4 Have Insufficient Water Supplies from Existing Entitlements and Resources to Serve the Project

Construction

All Facilities

Construction of the Project would require water for dust management and other similar construction uses. This water demand would be a small, temporary increment in demand as compared to existing water usage, and water would be brought on site in water trucks. As such, the Project should not create an insufficient supply from existing entitlements or resources.

Operations & Maintenance

All Facilities

Operation of the Project would divert flood flows from the Kings River for direct beneficial use and storage to supplement other existing supplies. Diversions are expected to occur pursuant to existing Kings River rights and licenses and/or a new appropriation. A water rights application was filed by Semitropic in May 2017 with the State Water Resources Control Board, Division of Water Rights for the Project. The proposed Project, however, is designed to provide a supplemental water supply for developed agricultural lands in Kern County and Kings County, and would not create a new demand for water supply on an annual basis. Water would only be obtained, on average, three out of ten years, when floodwaters are available on the Kings River. As such, the proposed Project would not require any additional entitlements, beyond those that are included and evaluated throughout this document.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact UTL-5 Be Served by A Landfill with Sufficient Permitted Capacity to Accommodate the Project's Solid Waste Disposal Needs

Construction

All Facilities

Construction of the Project would generate limited amounts of solid waste during construction. Soil removal would be handled in accordance with a Soil Management Plan, which would address any existing soil contamination and would reduce the volume of soil to be off-hauled from the Project area. A Construction and Demolition Waste Disposal Plan would also be required, specifying how the contractor would remove, handle, transport, recycle, and dispose of all material in a safe, appropriate, and lawful manner. Construction of the Project components (storage, conveyance and other facilities) would require excavation of approximately 13.9 million cy of material, of which approximately 13.4 million cy would be used for the construction of berms/levees, earthen pads etc. for all Project components. Based upon an evaluation of the earthwork impacts, it is estimated that approximately 480,000 cy of excess material would be left over, which could be utilized on embankments/levees, pump station earthen pads, etc. (see Appendix L for earthwork calculations). In this regard, it is not anticipated that landfill capacity would be needed for disposal of excess soils nor would the Project generate significant volumes of waste and therefore this impact is considered to be to less than significant.

Operations & Maintenance

All Facilities

Operation of the Project would not result in the generation of significant amounts of waste. Any wastes generated as a result of Project maintenance would be conveyed to one of the permitted local landfills. As the volume of waste is expected to insignificant relative to wastes generated by nearby urban areas, this impact is not expected to be significant.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact UTL-6 Compliance with Federal, State, And Local Statutes and Regulations Related to Solid Waste

Construction, Operations & Maintenance

All Facilities

None of the components of the proposed Project are expected to require a solid waste permit, but are still expected to maintain minimum operating standards as established in CCR, Title 14, Section 18100-18105.11. The Project would therefore have a less than significant impact on solid waste statues and regulations.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact UTL-7 Temporary Disruption of Utilities or Services Due to Construction-Related Activities

Construction, Operations & Maintenance

All Facilities

Construction of Project components, including the electrical switchyard and substation and Aqueduct Intertie facilities, and improvements to the South Fork Canal and Empire Weir No. 2 could potentially conflict with existing utilities or services located on or immediately adjacent to the Project area, particularly underground utility and/or overhead lines and irrigation water deliveries. Temporary disruption of utility services (i.e., electricity, water, gas, sewers, and storm water conveyance) is possible and must be mitigated to ensure that existing facilities near the Project area are not impacted. **Mitigation Measure UTL-1** would reduce this potential disruption impact to less than significant.

Significance Determination before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure UTL-1: Coordinate Relocation and Interruptions of Service with Utility and Service Providers During Construction

The construction contractor would be required to verify the nature and location of underground utilities before the start of any construction that would require excavation. The contractor would be required to notify and coordinate with public and private utility providers at least 48 hours before the

commencement of work adjacent to any utility. The contractor would be required to notify the service provider in advance of service interruptions to allow the service provider sufficient time to notify customers. The contractor would be required to coordinate timing of interruptions with the service providers to minimize the frequency and duration of interruptions.

Significance Determination after Mitigation

Less than significant.

Impact UTL-8 Result in a Substantial Increase in Overall or Per Capita Energy Consumption or Conflict with Applicable Energy Efficiency Policies or Standards

Construction, Operations & Maintenance

All Facilities

Energy intensity, measured as kilowatt-hours per acre-foot (kWh/AF), is a measure of the amount of energy required to perform water management activities, such as pumping, groundwater extraction, conveyance, and treatment (CEC, 2005). Project construction will use limited amounts of energy as compared to overall energy consumption in the Project area. Once constructed, the proposed Project would involve the capture of floodwater and conveyance to Semitropic and possibly other places of use and storage. Therefore, the potential impact is based upon the amount of energy required to capture flood flows from the Kings River via the South Fork Canal and conveyance to the California Aqueduct. Water conveyed from the California Aqueduct into storage would be delivered via gravity and would require very minimal power to lift it into storage when compared to the power demand for delivery to the Aqueduct.

Semitropic is proposing to interconnect to PG&E's existing High Voltage transmission system located within the Project area for electrical supply. Based upon the proposed conveyance capacity of the Project being considered (up to 2,100 cfs), the estimated energy demand could be as much as 48 MW. Given the energy demand of the proposed Project, new PG&E facilities would likely be required to provide service to the Project inasmuch as the existing PG&E facilities do not have the capacity (without modifications) to meet the Project energy demand. In this regard, the proposed Project could include new electrical facilities (constructed, owned and operated by PG&E and/or Semitropic) to provide power to Project facilities, including an interconnection to the existing PG&E 230 kV HV Transmission line, a 230 kV to 115 kV switchyard, a new 115 kV to 12 kV electrical substation, and/or up to 15 miles of 12 kV distribution powerline.

Certain Project operations will require pumping of water for conveyance. At the point of diversion from the South Fork Canal, water would flow via gravity and be lifted via the proposed Kettleman Pumping Plant #1 into the proposed Kettleman canal for conveyance to Kettleman Pumping Plant #2. At this pumping plant, the water would be re-lifted through the Aqueduct Intertie and ultimately delivered to the California Aqueduct. Additional pumping may also be required for canal-side pumping plants to move water from the South Fork Canal into the Kettleman Reservoir. In this regard, electrical power would be required for Project operations to power Kettleman Pumping Plant #1, Kettleman Pumping Plant #2, and the interior/canal pumping plants. Based on a power demand assessment, it is estimated that the Kettleman Pumping Plant #1 would require 6,250 kilowatts (kW) to run and the Kettleman Pumping Plant #2 would require 41,665 kW. Interior/canal pumping plants would require 208 kW, for a total power requirement of 48,113 kW. Assuming that, when Project operations occur, all pumps are running 24-hours per day for up to 140 days during the operational year, total power consumption would be approximately 161,700 megawatt-hours (MWh). As noted in *Chapter 2 Project Description*, the proposed Project would produce between 81,000 AFY and 120,000 AFY average annual. This would result in energy intensities of 1,996 kWh/AF and 1,347 kWh/AF, respectively. However, it is important to note that the proposed Project would

only occur approximately three in every 10 years, and therefore this energy consumption would not be regular nor sustained over time, and as such, the proposed Project's energy use is potentially significant.

With respect to energy intensity, typical energy use associated with groundwater supply and conveyance ranges from 225 to 585 kWh/AF as a national average (CEC, 2005). Based on this estimate, the proposed Project's energy consumption would be greater than the national average. However, in the context of energy intensity and benefits to the state, the primary benefit of flood water capture and storage is the ability to offset the high-energy intensity of SWP deliveries in the summery and fall. Groundwater banking and conjunctive use projects promote such strategies by recharging captured floodwaters during wet periods for later use during dry periods, either in the summer/fall months or during drought periods when supplies are low (CEC, 2005).

Implementation of the Project would intermittently increase demands on local energy providers, but the demands would be met by the construction of a new PG&E facility and the electricity would be required intermittently. To minimize the energy intensity of the proposed Project and the impact on local power supply providers while also supporting policies of the California Energy Action Plan II, the proposed Project would incorporate energy efficient equipment, such as system pumps and motors, in accordance with **Mitigation Measure UTL-2.** Such energy efficiency measures would reduce the overall power requirements associated with the proposed Project, and would reduce this potential impact to less than significant.

Significance Determination before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure UTL-2: Develop and Implement an Energy Efficiency Program

Semitropic shall install energy efficient equipment, including pumps and motors, for operations of the proposed Project. Additionally, to help offset Project energy consumption, Semitropic will periodically make available information about more energy efficient pumps and motors to groundwater users within its boundaries and encourage identification and replacement of inefficient models as appropriate.

Significance Determination after Mitigation

Less than significant.

Cumulative Impacts

The study area for cumulative utility and energy impacts consists of the service areas of the utilities that provide services to the Project Area. There are six relevant projects within the vicinity of the proposed Project that may contribute to cumulative impacts:

- Quay Valley Community Development - a new 7,175-acre community to be developed in south Kings County.
- Kettleman Hills Facility Expansion - expanding the existing B-18 Landfill and construct a new B-20 Landfill for hazardous waste and designated waste disposal.
- Kettleman City Surface Water Treatment Plant and Commercial Water Storage Tanks (Treatment Plant) – construction of a new surface water treatment plant to treat surface water for potable supply.
- Southwest Groundwater Banking Project – development of a project to divert and store floodwater from the Kings River and local stormwater.

- JID Distributed Recharge Bypass and Lassen Projects – improvement to and construction of recharge facilities to divert and store floodwater from the Kings River.
- Terranova On-Farm Flood Capture and McMullin Recharge Site – improvements to and construction of facilities to divert floodwater from the Kings River for recharge on existing farm lands.

Because the service areas for the various utility providers vary widely and, in some cases, cover large geographic areas (e.g., the PG&E service areas), it is quite likely that increased demand for energy due to future cumulative development in the service areas could be substantial and require an increase in supply and transmission infrastructure capacity to meet that demand and maintain adequate levels of service, notwithstanding future savings resulting from increased energy efficiencies. The construction of that infrastructure could result in adverse impacts on the environment. Although it would be speculative to attempt to determine the exact extent, location, and magnitude of potential impacts, given the cumulative demands and the size of the service areas, as well as potential infrastructure needs, it is quite likely that the cumulative energy impacts could be significant. Although the proposed Project's energy needs would be relatively minor, it could nonetheless contribute to potentially significant cumulative energy impacts.

With regard to consumption or generation related to other utilities (i.e., water, wastewater, and storm water), because the proposed Project would result in very minor increases in demand or generation (i.e., potable water, wastewater and storm water) or have a potentially beneficial effect on supplies (i.e., capture of floodwater to promote basin management), and because sufficient capacity exists to serve existing and future cumulative development, the proposed Project would not contribute to any significant cumulative impacts on these utilities.

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Chapter 4 Other CEQA Considerations

4.1 Introduction

CEQA contains statutory requirements that require Semitropic to consider the proposed Project's growth-inducing impacts (CEQA Guidelines, 15126.2(d)), cumulative impacts (CEQA Guidelines, 15130), significant irreversible environmental changes (CEQA Guidelines, 15126.2(c)), and significant environmental effects that cannot be avoided if the project is implemented (CEQA Guidelines, 15126.2(b)).

4.2 Significant and Unavoidable Impacts of the Project

As described in *Chapter 3 Environmental Analysis*, there would be no significant and unavoidable impacts associated with construction, operation, and maintenance of the proposed Project. As such, a Statement of Overriding Considerations for significant unavoidable, adverse impacts would not be needed. The District would still be required to adopt Findings as part of their approval of the EIR, as there would be a number of potential impacts resulting from the proposed Project. The mitigation measures described in Chapter 3, however, would reduce any potentially significant impacts to less than significant.

The No Project Alternative does have the potential to result in significant impacts associated with the current lack of a reliable water supply. There is a potential for continued flooding in the Tulare Lake bed, and an increase in groundwater pumping as a result of a lack of reliable water supply that could result in depletion of the groundwater basin in Kern County. In addition, it is likely that a lack of water supply could lead to the conversion of agricultural land to non-agricultural uses in Kern County. This would be a significant unavoidable impact.

4.3 Significant Irreversible Changes

Implementation of the proposed Project would require irreversible commitment of natural resources including construction materials; labor; and energy required for construction, operation, and maintenance. Commitment of non-renewable natural resources used in construction would include gravel, petroleum products, steel, and others. Commitment of energy resources for construction would include fuel oil, natural gas, and gasoline for heavy machinery.

Operation of the proposed Project would result in further commitment of energy resources. However, the consumption of energy for construction and operation would not be inefficient, wasteful or unnecessary. The proposed Project would support the capture of floodwaters currently leaving the Kings River system, provide flood risk reductions in the Project area and to nearby agricultural lands and disadvantaged communities, and improve local and regional water supply reliability. Because the Kettleman Reservoir can continue to be used for agriculture during the seven years out of ten when it is not used to store floodwaters, there would be very little irreversible loss of agricultural land. (Once constructed, only 1.6 percent of the overall Project area would no longer be grazable, that is, either in fenced areas or a levee).

4.4 Growth-Inducing Impacts

Projects are considered to have growth-inducing implications when economic, housing, or population growth occur either directly or indirectly. Local land use plans (e.g., general plans) provide for development patterns and growth policies that allow for the planned and orderly expansion of urban development (i.e., residential, commercial and industrial uses) supported by adequate urban public services (e.g., water supply, wastewater treatment, solid waste service disposal capacity, police and fire services). A project that would induce unplanned growth (i.e., conflict with local land use plans) could indirectly cause adverse environmental impacts not previously envisioned. Thus, to assess whether a project has the potential to

induce growth and result in adverse secondary effects beyond what is anticipated by the local jurisdiction, it is important to assess the degree to which the growth associated with a project would or would not be consistent with applicable land use plan.

Construction of the proposed Project would not directly induce population growth as no new residential or commercial development projects would be served by the Project (see *Chapter 3.14 Population and Housing*). The proposed Project would improve the management of floodwaters from the South Fork of the Kings River. Overall, the Project's new facilities would not accommodate growth in the service area, but instead aim to increase water supply reliability and ensure adequate water services for existing agricultural demands in Kern and Kings Counties. All Project facilities would be operated using District employees; therefore, few, if any, employees would relocate to the Project area and there would be no additional housing demand. The proposed Project is thus not expected to have any growth-inducing impacts.

The proposed Project would also not *indirectly* induce growth (by removing or reducing the barriers to growth) because the stored floodwaters would not be used to augment potable supplies in the Project region. The proposed Project was developed in response to restricted SWP deliveries in recent years and other drought-related effects and the need to achieve the groundwater sustainability goal of the 2014 Sustainable Groundwater Management Act. Stored water from the Project would alleviate shortages from restricted SWP deliveries that are presently resulting from drought-related effects, by providing water for irrigation purposes to existing growers. In lieu of losing floodwaters from the Kings River system, the Project would capture, re-regulate and manage these flows as supplies, thereby increasing water supply reliability and groundwater storage in existing banking programs south of the Delta. Thus, the Project would not indirectly accommodate additional development in the region, and impacts of growth inducement would be less than significant.

4.5 Environmentally Preferable/Superior Alternative

CEQA requires that an EIR identify an environmentally superior alternative (Guidelines, Section 15126.2). The No Project Alternative would not result in any of the physical impacts identified for the proposed Project in *Chapter 3, Environmental Analysis*, most of which are short-term construction impacts. However, the No Project Alternative could have long-term adverse effects on local flooding and regional groundwater resources. Without the proposed Project, agricultural lands in and nearby the Project area would continue to be inundated during flood events, impacting agricultural operations, and nearby disadvantaged local communities may be flooded which flooding and associated impacts may be worse than in the past due to recent increases in subsidence. Additionally, without the proposed Project, floodwaters would continue to be lost and local agriculture, faced with declining SWP deliveries, would continue to rely on groundwater as an alternative irrigation supply, potentially contributing to the long-term decline in groundwater levels and storage in the region. Thus, while the No Project Alternative avoids construction impacts, given the long-term potential effects on agriculture and on groundwater and surface water resources, it is not considered to be environmentally superior to the proposed Project. Additionally, the No Project Alternative would not meet any of the Project objectives.

Under CEQA, the evaluation of alternatives focuses on identifying alternatives that could minimize environmental impacts. Specifically, CEQA requires evaluation of alternatives that "feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project" (CEQA Guidelines, Section 15126.6(a)). In developing alternatives, the District originally identified 17 potential storage and floodwater protection alternatives with varying configurations, conveyance, and storage options (GEI, 2017). Alternative project locations were not identified as they did not provide required access to source waters (e.g. Kings River floodwaters), were not proximate to existing conveyance facilities (including the California Aqueduct), and/or contained landscape features that made construction of the project too expensive or difficult. Of the 17 project configurations originally considered,

three configurations were considered to be both technically and economically feasible: the "No Storage Alternative", where up to 2,100 cfs of floodwaters would be conveyed directly to the California Aqueduct; the "1,200 cfs Project Alternative" where up to 1,200 cfs of floodwaters would be conveyed from the Kings River to the Project, and up to 15,000 AF of floodwater storage would be provided; and the "2,100 cfs Project Alternative" where up to 2,100 cfs of floodwaters would be conveyed from the Kings River to the Project, and up to 30,000 AF of floodwater storage would be provided.

Comparison of the project alternatives shows that all project alternatives (except the No Project Alternative) result in environmental impacts, but that all impacts can be mitigated to a less-than-significant level. Additionally, none of the alternatives considered result in growth-inducing impacts when combined with identified other relevant projects.

Of the project alternatives resulting in facility construction, the No Storage Project Alternative results in the least impact to the environment, but that project alternative also provides the least amount of benefits to the environment and limits operational flexibility. The 1,200 cfs Project Alternative has less impact on the environment than the proposed Project (the 2,100 cfs Project Alternative), though more impacts than the No Storage Project Alternative, but still provides considerable environmental benefits and operational flexibility. However, the incremental increase in environmental impacts resulting from construction of the proposed (2,100 cfs) Project is small relative to the larger increase in benefits from the proposed Project in comparison to the 1,200 cfs Project Alternative. These increased benefits include greater ability to capture floodwaters (which tend to become available in large quantities over relatively short periods and which will lower the unit cost of water) and increased opportunities to avoid or mitigate flood damages in comparison to the 1,200 cfs Project Alternative. The proposed 2,100 cfs Project meets all the Project objectives, maximizes benefits, and does not result in any significant, unavoidable impacts that would otherwise be avoided by implementing one of the other alternatives. As considered herein, the 2,100 cfs Project Alternative provides the greatest benefits while reducing environmental impacts and is therefore considered to be the environmentally-superior alternative.

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Chapter 5 Alternatives Analysis

The following discussion evaluates alternatives to the proposed Project and examines the potential environmental impacts associated with each alternative. Through comparison of these alternatives to the proposed Project, the relative environmental advantages and disadvantages of each are identified.

5.1 CEQA Requirements for Alternatives Analysis

CEQA Guidelines Section 15126.6 requires EIRs to evaluate a range of reasonable alternatives to a project, or to the location of a project that would feasibly attain most of the basic project objectives and avoid or substantially lessen significant project impacts, and evaluate the comparative merits of the alternatives. The following criteria for selecting alternatives are set forth in the Guidelines:

- An EIR must consider a reasonable range of potentially feasible alternatives that will foster informed decision-making and public participation. The lead agency is responsible for selecting a range of project alternatives for examination and must publicly disclose its reasoning for selecting those alternatives. The range of alternatives addressed in an EIR should be governed by a rule of reason. Not every conceivable alternative must be addressed, nor do infeasible alternatives need to be considered (CEQA Guidelines, Section 15126.6(a)). When addressing feasibility, factors that may be taken into account may include site suitability, economic viability, availability of infrastructure, other plans or regulatory limitations, jurisdictional boundaries, and the proponent's ability to reasonably acquire, control, or otherwise have access to an alternative site.
- Evaluation is to focus on those alternatives capable of either avoiding or substantially lessening any significant environmental effects of the project, even if the alternative would impede, to some degree, the attainment of the project objectives, or would be more costly.
- The EIR should identify alternatives that were considered by the lead agency but were rejected as infeasible and the reasons for the lead agency's determination (Section 15126.6(c)).
- A "No Project" alternative must be evaluated and the EIR must also identify an environmentally superior alternative (Section 15126.6(e)).

In general, there are two types of alternatives that may be reviewed in an EIR: (1) alternatives *to* the project that are other projects entirely, or other approaches to achieving the project objectives rather than the project or modified project; and (2) alternative configurations of the project that include modified project components, such as alternative project sites or processes and/or modified facilities, layout, size, and scale. The discussion should not consider those alternatives whose implementation is remote or speculative, and the analysis need not be presented in the same level of detail as the assessment of the proposed project.

In accordance with CEQA Guidelines, several factors should be considered in determining the range of alternatives to be analyzed in an EIR and the level of analytical detail that should be provided for each alternative. These factors include:

1. The potential for the proposed project to result in significant impacts;
2. The ability of alternatives to reduce or avoid the significant impacts associated with the proposed project;
3. The ability of the alternatives to meet the objectives of the proposed project; and

4. The feasibility[1] of the alternatives.

5.2 Project Objectives

As described in *Chapter 2 Project Description*, the following objectives have been established for the proposed Project and are used to aid decision makers in reviewing the Project and associated environmental impacts:

- Improve local and regional water supply reliability
- Achieve statewide operational flexibility for meeting critical Delta ecosystem needs
- Expand groundwater conjunctive use opportunities
- Reduce flood risk
- Improve environmental and recreational areas

5.3 Key Impacts of the Proposed Project

Chapter 3 Environmental Analysis of this EIR identifies potential impacts associated with the proposed Project for each environmental issue area in Appendix F and Appendix G of the CEQA Guidelines, including long-term and short-term impacts. A range of potential alternative configurations of the Project were considered such that the considered alternatives would meet the Project's objectives and maximize the Project's benefits at the most reasonable cost while minimizing Project impacts. Mitigation measures are identified to render any impacts less than significant if possible. Possibly significant impacts from Project construction and/or operation were identified during the impact analyses; however, mitigation measures were identified that, when implemented, would reduce all impacts to less than significant. A summary of the significance of the impacts for each environmental resource analyzed in Chapter 3 is presented below in **Table 5.**. The table does not include impacts or criteria that were deemed not applicable to construction or operation of the proposed Project.

Based on analysis conducted as part of the environmental review, it was determined that the most extensive impacts from the proposed Project were related to cultural and biological resources. The general proposed Project location is known to be sensitive for archaeological resources because of the presence of the Tulare Lake shoreline and the known quantity of cultural resources within the Project site and surrounding area. Additionally, numerous previously-recorded cultural resources around the Project site have been identified as containing human remains, thus increasing the overall sensitivity of the location. However, Project activities will mostly, if not exclusively, occur in areas that have been farmed in the past, and soil excavation activities will generally not occur where cultural resources have been found – mostly near the Blakeley Canal. As such, the potential for significantly impacting cultural resources can be substantially lessened through the implementation of mitigation measures. The potential for biological resource impacts is high due to the size of the proposed Project, as well as the number and extent of habitat associated with special status species in the area. However, all biological resource impacts are mitigatable.

[1] The issue of feasibility arises at two different junctures: (1) in the assessment of alternatives in the EIR and (2) during the agency's later consideration of whether to approve the project. Differing factors come into play at each stage or phase. For the EIR inclusion phase, the standard is whether the alternative is *potentially* feasible, and for the final decision on the project approval phase, as required by CEQA, the decision-making body evaluates whether the alternatives are *actually* feasible and may at this phase reject as infeasible alternatives that were identified in the EIR as potentially feasible. (*California Native Plant Society v. City of Santa Cruz* (2009) 177 Cal.App.4th 957, 981, citing *Mira Mar Mobile Community v. City of Oceanside* (2004) 119 Cal.App.4th 477, 489.)

5.4 Project Alternatives

This EIR evaluates three Project Alternatives, which are compared to the No Project Alternative. Identification of the No Project Alternative and Project Alternatives for this EIR was informed by the purpose and need of the Project, as described in *Chapter 2 Project Description.*

5.4.1 Alternatives Rejected from Further Consideration

Alternatives may be eliminated from detailed consideration in an EIR if they fail to meet most of the project objectives, are infeasible, or do not avoid or substantially reduce any significant environmental effects (CEQA Guidelines, Section 15126.6(c)]). Alternatives that are remote or speculative, or the effects of which cannot be reasonably predicted, also do not need to be considered (CEQA Guidelines, Section 15126(f)(2)). As described in the report entitled *Preliminary Design Report, Alternatives Analysis, Tulare Lake Storage and Floodwater Protection Project, Kings County, California* (GEI, 2017f – see Appendix K.), 17 potential storage and floodwater protection alternatives with varying configurations, conveyance, and storage options were considered and analyzed before selecting the proposed Project. Alternatives were analyzed in a three-step process in which Step 1 scored alternatives based on technical feasibility, conveyance to/from the Project and the Aqueduct, amount of storage, number of pump stations, conceptual construction costs, maximizing the use of existing easements to minimize disturbance to private landowners, and other key considerations. Alternatives that were not eliminated in Step 1 were further evaluated in Step 2, which scored alternatives based on total length of conveyance, quantity of earth excavated for conveyance facilities, ability to use gravity service to the storage reservoir, if the conveyance required a Los Angeles (LA) County right-of-way (for construction of conveyance through adjacent LA County-owned property), number of pump stations, and cost. Alternatives that scored the highest in Step 2 were then analyzed under Step 3, where conceptual designs were further refined. Under Step 3, alternatives were analyzed based upon optimization of conveyance alignment and pump station locations, storage need based upon water capacity for delivery to the Aqueduct and cost. The alternatives listed below were eliminated from further consideration because they did not meet Project objectives, were considered less feasible compared to other designs, or would result in higher environmental impacts (e.g. largest volumes of soil to be handled for project construction; higher energy use requirements, impacts on sensitive habitat).

Storage Alternatives

Three Storage Reservoirs Alternative

This project alternative would use three storage reservoirs, tentatively named the Kettleman, North of Utica, and Liberty Reservoirs to temporarily store Kings River floodwaters. These excess flows would be conveyed to the three storage facilities using the Blakeley Canal. No new conveyance facilities would be constructed under this scenario. In total, all three storage reservoirs would consume 27,981 acres of land and would be able to store two- to four-feet of water for a total storage capacity of 108,000 acre-feet, as shown below, in **Table 5.1.**

Table 5.1: Storage Facilities Information

Basin	Gross Area (ac)	Average Water Depth (ft.)	Net Vol (ac-ft.)
Kettleman	10,235	2.0	14,856
Utica	4,965	3.5	25,534
Liberty	12,691	4.0	67,654
Total	**27,891**	**3.2**	**108,044**

This alternative was eliminated from further consideration as the marginal increase in water storage capacity was offset by a much larger increase in cost associated with constructing three reservoirs. Additionally, a greater area of land would be unavailable for dry grazing during periods of operation as compared to the one reservoir design. Eliminating two of the reservoirs from consideration also reduced the potential to affect possible cultural and/or biological resources?. Due to the less desirable land use impacts and higher cost per acre-foot of water produced by the project, this alternative was eliminated from consideration.

Alternative Project Facilities Location

In siting the proposed Project, a set of specific site characteristics were compiled for identifying and screening potential project locations. These characteristics included the ability to obtain floodwaters from a proximate source, a cost-effective means for conveying those floodwaters to the project site and/or to the District's groundwater bank, and landowner(s) willingness to grant easements or work in partnership with the District. The location of the proposed Project was selected due to its unique combination of traits, including proximity to the California Aqueduct (as a means of conveying water to the District's banking facilities), sufficient topographical relief (to minimize associated costs for reservoir construction), proximity to existing conveyance structures (e.g. ability to use existing diversion structures and canals to minimize construction costs and environmental impacts), and proximity to a floodwater supply (South Fork of the Kings River). Together, the characteristics of the proposed Project location allow for the development of a technically feasible, cost-effective project that minimizes environmental impacts whereas other locations initially screened did not have the required combination of site characteristics for a successful project or would result in increased environmental impacts. For these reasons, alternative project locations were eliminated from further consideration.

Conveyance Alternatives

The alternatives listed below were identified as potential alternatives for collecting and transferring water to the proposed Kettleman Reservoir, and/or directly to the California Aqueduct, using either the existing Blakeley Canal, South Fork Canal, or both. The conveyance alignments were evaluated based upon the following:

- Maximizing conveyance flexibility to and from the Aqueduct.
- Minimize distance of the conveyance facilities to minimize impacts to cultural and biological resources.
- Minimize costs associated with construction.
- Minimize pumping requirements and make use of conveyance via gravity deliveries, where applicable.
- Maximize the use of existing easements to minimize disturbance to private landowners.
- Considerations regarding existing conveyance capacity and capacity rights.
- Constructability of improvements to existing conveyance facilities given the frequent use.

The conveyance alternatives explored pairing with either a storage option or a no storage/flow through only option. Conveyance alternatives were eliminated primarily due to:

- Unknown feasibility of obtaining landowners' approval toto make significant modifications to increase the conveyance capacity of the conveyance facility. (This applied primarily to the Blakeley Canal.)

- Potential impacts to cultural resources that would result from increasing conveyance capacity.
- Constructability issues related to increasing conveyance capacity due to the frequent use of the existing conveyance facilities, which did not provide for a window to complete the proposed improvements.

Based on these issues, the following conveyance alternatives were rejected from further consideration:

Blakeley Canal Only

Under this Alternative, only the Blakeley Canal would be used to convey water to the Project site. Water would be diverted from the Empire Weir No. 2 into the Blakeley Canal. The northern and southern reaches of the Blakeley Canal would be improved to accommodate flows up to 2,100 cfs, while the eastern reach of the Blakeley Canal, east of 23rd Avenue, would be expanded to accommodate up to 600 cfs of flow. This Alternative was eliminated due to the magnitude of improvements required in order to accommodate increased flows, constructability issues relating to increasing the conveyance capacity due to the frequent use of the conveyance facilities, potential impacts to cultural resources, and cost. Additionally, the increased volume of water diverted through the Blakeley Canal would require operational changes, requiring approval from landowners, who might not have agreed to those changes if they could not feasibly accommodate the revised operations.

Blakeley Canal and Kettleman Conveyance

Under this Alternative, the Blakeley Canal would be used in conjunction with a new canal (the Kettleman Conveyance) to move floodwaters diverted at Empire Weir No. 2 to the Project site. The North and East reaches of the Blakeley Canal would be used, and through construction of a new channel, would eliminate the need to improve the South Blakeley Canal to route to the Aqueduct intertie. This Alternative was eliminated due to the extensive modifications that would be required to accommodate up to 2,100 cfs in the Blakeley Canal, constructability issues relating to increasing the conveyance capacity due to the frequent use of the conveyance facilities, the potential for impacts to cultural resources identified along the Blakeley Canal, related construction costs, and the extensive coordination with adjacent landowners that would be required to make this alternative feasible.

Kings River South Fork Canal and New Open Channel Conveyance

This Alterative would use the South Fork Canal as the main conveyance facility and would divert water using a new weir structure into a new open channel conveyance from the South Fork Canal. The new channel would convey water to a new pump station that would lift the water up from the open channel to travel through the Kettleman Reservoir and ultimately to the California Aqueduct via a series of individual storage cells, pipelines, and small pump stations. However, the need to route conveyance around LA County property complicated this alternative design and increased the overall Project cost. That, along with technical infeasibility due to site topography and the inability to convey water by gravity ultimately lead to the elimination of this Alternative.

Kings River South Fork Canal, New Main Conveyance Open Channel, and Curved Channel through Reservoir

Under this Alternative, 2,100 cfs of water from the South Fork Canal would be diverted through a new weir structure into a new main conveyance open channel. The channel would convey water to a new large conveyance pump station which, in turn, would lift the water up to a second open channel. The water would then be conveyed via this second channel to another conveyance pump station located south of Racine Avenue. The pump station would pump water up to the California Aqueduct via large diameter pipelines. Under this Alternative, water would be routed closer to Blakeley Canal to take advantage of existing topography and minimize cut/fill. However, this routing increased the length of the total conveyance system by about two miles (to a total length of approximately 15.5 miles) and incurred complications to the design of interior storage cells due to the curved routing of the channel through the reservoir, making this

alternative one of the most expensive. Due to this alternative's cost and potential increase in environmental Impacts (e.g. potential increase in air pollutant and GHG emissions) resulting from the expanded length of the overall conveyance system, this Alternative was eliminated from further consideration.

5.5 Alternatives Selected for Analysis

The following alternatives have been determined to represent a reasonable range of alternatives that have the potential to feasibly attain most of the basic objectives of the proposed Project but which may avoid or substantially lessen the significant impacts of the proposed Project. The "Environmentally Superior" Alternative, as required by CEQA is described in *Section 5.7, Environmentally-Superior Alternative*. The following alternatives are analyzed in detail below.

5.5.1 No Project Alternative

CEQA Guidelines Section 15126.6(e)(3)(B) requires a comparison of the environmental effects of maintaining the Project area in its existing state against the environmental effects that would occur if the Project were to proceed. Under the No Project Alternative, the proposed Project would not be implemented, and the conveyance and storage facilities described in *Chapter 2 Project Description* would not be constructed or improved. None of the short-term construction impacts or long-term operational impacts described in *Chapter 3, Environmental Analysis* of this EIR would occur. The No Project Alternative would eliminate the potential for short-term construction period impacts associated with aesthetics, agriculture, air quality, biological and cultural resources, geology, greenhouse gas emissions, hazardous materials, hydrology, mineral resources, noise, and disruption of utilities. Operational impacts associated with the cultural resource sensitivity within the Project site and vicinity would not occur. However, all of the construction and operational impacts of the proposed Project, save potential impacts to tribal and/or archaeological should they be uncovered during construction, can be reduced to a level of less than significant with the implementation of mitigation measures, so the No Project Alternative is not a substantively environmentally superior to the proposed Project.

CEQA Guidelines Section 15126.6(e)(3)(B) also requires discussion of the practical effects of not proceeding with the Project. Although the No Project Alternative would eliminate the potential for construction period impacts and would avoid some operational impacts, the No Project Alternative is not considered environmentally superior because, without construction of the Project's storage or conveyance facilities, Project objectives would not be realized. Flood risk in the Kings River region and associated loss of production on prime agricultural lands and damage to local disadvantaged communities would continue to be high, particularly in light of well-documented subsidence in the area, and excess flows would be lost through flooding rather than strategically captured and stored for future use. The Project's potential to improve regional water supply reliability, increase related operational flexibility in the region, reduce dependence on surface water imports from SWP and Delta, and reduce reliance on limited native groundwater supplies would also not be realized. The Project's restoration of intermittent freshwater habitat in the historic Tulare Lake area and associated benefits, including to waterfowl along the Pacific Flyway, and the scenic and recreational benefits of the Project near Interstate 5 and Highway 41 would not occur without the Project.

5.5.2 Alternative 1 – 1,200 cfs Project

Alternative 1 is identical to the proposed Project; however, it has been designed to operate on a smaller scale, conveying 1,200 cfs to the California Aqueduct (instead of 2,100 cfs with the proposed Project) and storing up to 15,000 AF of floodwater (compared to up to 30,000 AF of storage under the proposed Project). In general, this Alternative contains all the components of the proposed Project, but with the following differences:

- The Kettleman Reservoir would have the same footprint, but with levees that would be, on average, six feet in height.
- The proposed Kettleman Weir and diversion structure and the Kettleman Canal would be sized to accommodate maximum flows of 1,200 cfs.
- The Aqueduct Intertie would require only two, 144-inch diameter parallel pipelines.
- The Kettleman Pumping Plants #1 and #2 would have fewer pumps and would generally be downsized to accommodate maximum flows of 1,200 cfs.
- The turn-in/turnout at the Aqueduct would be sized to accommodate maximum flows of 1,200 cfs.
- The proposed turn-in/turnout facilities on the Kettleman Canal, within the Kettleman Reservoir would be sized to accommodate lesser flows.
- Electrical facilities (i.e. PG&E switchyard and substations) would be sized for a lesser power demand, which would translate to a smaller electrical facility.

Limiting the levee heights to six feet would eliminate the need to obtain permits from and operate under the oversight of the California DSOD, thereby allowing the Project to avoid added costs associated with DSOD regulations and the review processes, and the smaller project facilities would result in a smaller construction footprint. All Project operations would generally remain the same; water would be conveyed from the Kings River to the California Aqueduct via the existing South Fork Canal and new Kettleman Canal, and to the Kettleman Reservoir using the Blakeley Canal, and the Aqueduct Intertie facilities would generally be the same; however, the smaller project capacity would reduce power demands as compared to the proposed Project.

This project alternative has generally the same construction-related impacts as the proposed Project, though the extent of those impacts may be less as facilities would be generally smaller in size. The operational impacts associated with this alternative are also less, singly as a result of decreased energy demands and associated air pollutant and GHG emissions.

Similar to the proposed Project, there are no significant and unavoidable impacts associated with this alternative except for the potential for significant impacts to occur to tribal and/or archaeological resources should they be uncovered during construction. Potential impacts associated with agriculture; air quality; aesthetics; biological and cultural resources; noise; oil, gas and mineral resources; population and housing; public services; recreation; transportation; and utilities would be essentially the same as for the proposed Project, though impacts may be somewhat less in the case of some impacts (such as air, GHG emissions and land use) due to the reduced scope and size of this alternative. This project alternative would meet similar local and regional objectives, including reducing local flooding and improving local and regional water supply reliability; however this alternative yields less water supply than the proposed Project and therefore provides reduced benefits to the region and the state in terms of expanding groundwater conjunctive use opportunities and improving south of the Delta storage. Also, this project alternative does have a reduced level of benefit relative to reductions in potential flooding in the project area, and it may also provide a lesser level of benefits to migratory water fowl as there will be less water captured and placed

in storage in Kettleman Reservoir for a shorter period of time. Because flood flows come in large volumes over relatively short periods, this alternative is less desirable and less able to meet the Project objectives of re-routing otherwise potentially harmful flood flows to storage and beneficial uses in comparison to the proposed Project.

5.5.3 Alternative 2 - No Storage Project

Alternative 2, the "No-Storage Project" Alternative is essentially the same as the proposed Project, but without the construction of the proposed Kettleman Reservoir and without use of the Blakeley Canal for conveyance. Under this alternative, floodwaters from the Kings River would be conveyed directly to the California Aqueduct via Empire Weir No. 2, the South Fork and Kettleman Canals, and Aqueduct Intertie. Similar to the proposed Project, this alternative would have the ability to convey up to 2,100 cfs to the California Aqueduct; however, due to the absence of the reservoir, no floodwater would be stored offstream and project production would be limited to the capacity of the California Aqueduct to convey water to the District's service area and places of use at the time of the diversion. Additionally, under this alternative, the project would not be able to re-regulate Delta flows from and back to the California Aqueduct due to the lack of storage (though the ability to divert water to the District's service area and other places of use would remain). All other common Project facilities, such as the two external pumping plants, maintenance yard and electrical substation, would still be constructed and operated.

This project alternative has generally the same impacts as the proposed Project, though the extent of those impacts are less simply from the elimination of the reservoir component. Fewer acres of the proposed Project site are impacted by this alternative, and a much smaller volume of soil is moved during construction. Additionally, the lack of the reservoir component in this alternative limits the potential for the project to interfere with the movement of wildlife species or impede use of native wildlife nursery sites.

Similar to the proposed Project, there are no significant and unavoidable impacts associated with this alternative. Potential impacts associated with hazardous materials, land use and planning, noise, public services, and utilities would be essentially the same as the proposed Project. Potential impacts associated with agriculture; air quality; aesthetics; biological and cultural resources; oil, gas and mineral resources; population and housing; recreation; and transportation would be essentially the same as for the proposed project, but to a lesser degree. For instance, this Alternative results in a much smaller volume of soil excavated for project facilities than the proposed Project, which would require fewer mitigation measures for air quality and transportation compared to the proposed Project.

This alternative would not meet project objectives as successfully as the proposed Project as the lack of on-site water storage would limit the volume of Kings River floodwater that could be diverted would eliminate the ability to temporarily store surplus Delta flows from the California Aqueduct, thereby potentially reducing the level of benefits associated with improving local and regional water supply reliability, increasing flexibility to meet Delta ecosystem needs, expanding groundwater conjunctive uses, and reducing flood risk. Without the Kettleman Reservoir, this alternative would not enhance wildlife habitat and recreational opportunities in the historic Tulare Lake bed because no water would be stored on site to support waterfowl, migratory birds, or water-related opportunities.

This alternative does have a reduced level of benefit relative to reductions in potential flooding in the project area, and it also does not provide any benefits to migratory water fowl nor for Delta flow re-regulation as this alternative does not include the Kettleman Reservoir.

5.6 Comparison of Alternatives

The alternatives determined to be potentially reasonable and feasible were analyzed to determine if significant impacts can be substantially reduced or avoided. **Table 5.2** provides a comparison of the

environmental impacts of the alternatives as compared to the proposed Project, as well as the impacts that would result from implementation of the No Project Alternative. The No Project Alternative must be analyzed pursuant to Section 15126.6(e) of the CEQA Guidelines to allow decision makers to compare the impacts of approving the proposed Project with the impacts of not approving the proposed Project. The three Project alternatives differ in regard to the storage and conveyance facilities, so the comparison of impacts focuses on the differences in the impacts of those Project-level facilities and the benefits associated with each alternative.

Table 5. compares the environmental effects of the project alternatives to the proposed Project and reflects the level of significance after mitigation. The level of impact is color-coded, with areas of no impact or less than significant impacts in shades of green, impacts that can be mitigated to less than significant in yellow, potentially significant impacts in orange, and significant and unavoidable impacts highlighted in red. As shown in the table, all potentially significant impacts of the proposed Project and Project alternatives can be reduced to a level of less than significant with the implementation of mitigation measures. Additionally, the proposed Project does not include any significant and unavoidable impacts.

5.7 Environmentally-Superior Alternative

CEQA requires that an EIR identify the environmentally-superior alternative of a project other than the No-Project Alternative (CEQA Guidelines, Section 15126.6 (e)(2)). In identifying the environmentally-superior alternative, the extent of environmental impacts was considered in conjunction with the benefits provided by the project. Per CEQA, the costs associated with the project is not considered in the context of identifying the environmentally-superior alternative; rather, it is the responsibility of the Lead Agency to select the appropriate alternatives and issue, if required, a statement identifying the overriding considerations that led to that decision.

As stated at the beginning of this chapter, the purpose of this alternatives analysis is to consider a reasonable range of alternatives that could feasibly attain most of the basic Project objectives and avoid or substantially lessen significant Project impacts. Implementation of the No Project Alternative would not result in any adverse environmental impacts, but it also would not meet any of the Project objectives nor provide any of the benefits associated with the other project alternatives. In turn, the proposed Project and the project alternatives would not avoid impacts nor produce any significant, unavoidable impacts, and all three projects would provide some levels of benefits with the Proposed Project providing the most benefits.

The 2,100 cfs Project is considered the environmentally-superior alternative because it meets all the Project objectives and does not result in any significant, unavoidable impacts that would otherwise be avoided by implementing one of the other alternatives. While the No Storage Project Alternative produces fewer environmental impacts than the 1,200 cfs Project Alternative, it does not provide the same level of benefits nor provide the operational flexibility required to achieve those benefits. As such, this alternative is less desirable than the proposed Project because, among other disadvantages, it will re-route less potentially damaging flood flows, produce less water for recreation and waterfowl benefits, and will miss opportunities to capture flood flows that the proposed Project was designed to capture (that is, high flows which, based on the historic record, generally become available for diversion in large quantities over only a few months of the year during very wet hydrologic events). As considered herein, the 2,100 cfs Project Alternative provides the greatest benefits while reducing environmental impacts.

Table 5.2: Impact Comparison of Alternatives to the Proposed Project

Impact Statement	Impacts After Mitigation			
	Proposed Project: 2,100 cfs Project	Alternative 1: 1,200 cfs Project	Alternative 2. No Storage Project	No Project Alternative
Aesthetics				
AES-1: Damage scenic resources, including trees, rock outcroppings, and historic buildings within a scenic highway	LTS	LTS	LTS	NI
AES-2: Substantially degrade existing visual character or quality of site surroundings or have a substantial adverse effect on a scenic vista	LSM	LSM	LTS	NI
AES-3: Create a new source of substantial light or glare	LSM	LSM	LSM	NI
Agriculture and Forestry Resources				
AG-1: Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use	LSM	LSM	LSM	NI
AG-2: Conflict with existing zoning for agricultural use or a Williamson Act contract	LTS	LTS	LTS	NI
AG-3: Other changes to existing environment that would convert Farmland to non-agricultural use or forest land to non-forest use	LTS	LTS	LTS	NI
Air Quality				
AIR-1: Violate an air quality standard or contribute to an existing air quality violation or increase criteria pollutants	LSM	LSM	LSM	NI
AIR-2: Expose sensitive receptors to a substantial pollutant concentration	LTS	LTS	LTS	NI
AIR-3: Create odors affecting numerous people	LTS	LTS	LTS	NI
AIR-4: Conflict with applicable air quality plan	LTS	LTS	LTS	NI
Biological Resources				
BIO-1: Adverse effect on a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations	LSM	LSM	LSM	NI
BIO-2: Adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations	LSM	LSM	LSM	NI
BIO-3: Adverse impact on federally protected wetlands	LSM	LSM	LSM	NI
BIO-4: Interfere with the movement of fish or wildlife species, or impede use of native wildlife nursery sites	LSM	LSM	LSM	NI
BIO-5: Conflict with local policies or ordinances	LTS	LTS	LTS	NI
Cultural Resources				
CR-1: Impact historical and unique archaeological resources	LSM	LSM	LSM	NI

Impact Statement	Impacts After Mitigation			
	Proposed Project: 2,100 cfs Project	Alternative 1: 1,200 cfs Project	Alternative 2. No Storage Project	No Project Alternative
CR-2: Impact historical resources	LSM	LSM	LSM	NI
CR-3: Significant impact on paleontological resources	LSM	LSM	LSM	NI
CR-4: Impact human remains	LSM	LSM	LSM	NI
CR-5 Impact tribal cultural resources	LSM	LSM	LSM	NI
Geology and Soils				
GEO-1: Expose people or structures to substantial adverse effects from strong seismic groundshaking	LSM	LSM	LSM	NI
GEO-2: Risk to property and life from expansive soils	LSM	LSM	LSM	NI
GEO-3: Facility damage and exposure of people to hazards from liquefaction and lateral spreading	LSM	LSM	LSM	NI
GEO-4: Result in substantial soil erosion or loss of topsoil	LTS	LTS	LTS	NI
GEO-5: Salinization of soils	LSM	LSM	LTS	NI
Greenhouse Gas Emissions				
GHG-1: Generate greenhouse gas emissions	LTS	LTS	LTS	NI
GHG-2: Conflict with an applicable plan aimed to reduce greenhouse gas emissions	LTS	LTS	LTS	NI
Hazards and Hazardous Materials				
HAZ-1: Transport, use, or dispose of hazardous materials	LSM	LSM	LSM	NI
HAZ-2: Disturbance of onsite hazardous materials that could potentially create a safety hazard to the public or environment	LSM	LSM	LSM	NI
HAZ-3: Located on a listed hazardous material site (pursuant to Government Code Section 65962.5)	LTS	LTS	LTS	LTS
HAZ-4: Create a safety hazard for people working near the vicinity of a private airstrip	LTS	LTS	LTS	NI
HAZ-5: Impair or interfere with an adopted emergency evacuation and response plan	LSM	LSM	LSM	NI
HAZ-6: Expose people or structures to wildfire risks	LSM	LSM	LSM	NI
HAZ-7: Create a new or increased human health hazards associated with vector-borne diseases	LSM	LSM	LSM	NI
Hydrology and Water Quality				
HYD-1: Exceed any water quality standards or waste discharge requirements	LSM	LSM	LSM	NI
HYD-2: Substantially deplete groundwater supplies or interfere with groundwater recharge	LTS	LTS	LTS	NI

Impact Statement	Impacts After Mitigation			
	Proposed Project: 2,100 cfs Project	Alternative 1: 1,200 cfs Project	Alternative 2. No Storage Project	No Project Alternative
HYD-3: Alter existing drainage pattern and cause substantial erosion or siltation	LSM	LSM	LSM	NI
HYD-4: Alter existing drainage pattern and increase surface runoff (resulting in flooding) and/or expose people or structures to risks from flooding (including flooding as a result of dam/levee failure)	LTS	LTS	LTS	NI
HYD-5: Alter flows in stream or river that results in changes to flow patterns in downstream river and/or Delta	LTS	LTS	LTS	NI
HYD-6: 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 otherwise degrade water quality	LSM	LSM	LSM	NI
HYD-7: Place structures within a 100-year flood hazard area that would impede or redirect flood flows	LTS	LTS	LTS	NI
Land Use and Planning				
LUR-1: Conflict with an applicable land use plan adopted for the purpose of avoiding/mitigating an environmental effect	LTS	LTS	LTS	NI
LUR-2: Conflict with a HCP and NCCP	LTS	LTS	LTS	NI
Noise				
NOI-1: Temporary, construction-related noise increases in excess of noise ordinance	LSM	LSM	LSM	NI
NOI-2: Temporary, construction-related vibration increases	LSM	LSM	LSM	NI
NOI-3: Increases in ambient noise levels due to operational noise and vibration	LSM	LSM	LSM	NI
NOI-4: Noise exposure from private airstrips	LSM	LSM	LSM	NI
Oil, Gas and Mineral Resources				
OIL-1: Result in loss of availability of a known mineral resource	LTS	LTS	LTS	NI
OIL-2: Result in loss of availability of mineral resource recovery site	LTS	LTS	LTS	NI
OIL-3: Substantially affect existing mineral resource recovery operations	LTS	LTS	LTS	NI
Population and Housing				
POP-1: Induce population growth	LTS	LTS	LTS	NI
Public Services				
PUB-1: Impact government facilities or increase the need for new or physically altered governmental facilities	LSM	LSM	LSM	NI
Recreation				

Impact Statement	Impacts After Mitigation			
	Proposed Project: 2,100 cfs Project	Alternative 1: 1,200 cfs Project	Alternative 2. No Storage Project	No Project Alternative
REC-1: Increase use of existing parks or other recreational facilities	LTS	LTS	LTS	NI
REC-2: Include recreational facilities or require expansion of existing recreational facilities	LTS	LTS	LTS	NI
Transportation/Traffic				
TRA-1: Increase in traffic and conflicts with traffic-related policies	LSM	LSM	LSM	NI
TRA-2: Increase hazards due to a design feature	LTS	LTS	LTS	NI
TRA-3: Impacts to emergency access	LSM	LSM	LSM	NI
TRA-4: Conflict with alternative transportations and adopted policies regarding public transit	LTS	LTS	LTS	NI
Utilities and Service Systems				
UTIL-1: Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board	LTS	LTS	LTS	NI
UTIL-2: Require construction of new or expansion of existing water or wastewater facilities	LTS	LTS	LTS	NI
UTIL-3: Require construction of new storm water drainage facilities or expansion of existing facilities	LTS	LTS	LTS	NI
UTIL-4: Have insufficient water supplies available to serve the Project from existing entitlements and resources	LTS	LTS	LTS	NI
UTIL-5: Be served by a landfill with sufficient permitted capacity to accommodate the Project's solid waste disposal need	LSM	LSM	LSM	NI
UTIL-6: Comply with federal, state, and local statues and regulations related to solid waste	LTS	LTS	LTS	NI
UTIL-7: Result in disruption of utilities	LSM	LSM	LSM	NI
UTIL-8: Result in a substantial increase in overall or per capita energy consumption or conflict with applicable energy efficiency policies or standards	LSM	LSM	LSM	NI

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Chapter 6 Document Preparation

This document was prepared by Semitropic Water Storage District, Woodard & Curran, GEI Consultants Inc., and Rincon Consultants, Inc. Staffs from Semitropic Water Storage District and companies that were involved include the following:

Semitropic Water Storage District

- Jason Gianuinto, General Manager
- Isela Medina, Project Lead

Woodard & Curran

- Alyson Watson, Principal-in-Charge
- Lyndel Melton, Project Manager
- Leslie Dumas, Deputy Project Manager
- Robin Cort, CEQA Lead
- Susan Yogi, CEQA/Planner
- Josh Uecker, Planner
- Rudy Calderon, Planner
- Sally Johnson, Planner
- Lauren Salberg, Planner
- Joey Yan, Planner

GEI Consultants Inc.

- Larry Rodriguez, Project Manager
- Mark Rozman, Chief Design Engineer
- Satya Gala, Senior Engineer
- Richard Sanchez, Engineering Lead
- Erica Bishop, Senior Planner
- Teddy Huang, Executive Engineer
- Michael Dargahi, Senior Engineer
- Stephanie Hearn, Senior Water Quality Specialist
- Graciela Cruz, Staff Engineer

Rincon Consultants, Inc.

- Colby J. Boggs, Principal-in-Charge
- Jeremy Kinney, Project Manager
- Christopher Duran, Registered Professional Archaeologist
- Hannah Haas, Archaeologist
- Ashlee Bailey, Archaeologist
- Kevin Hunt, Cultural Resources Program Manager
- Heather Rodriguez, Senior Biologist

- Justin Jack, Senior Biologist
- Meg Perry, Senior Biologist
- Sophial Murrell, Associate Biologist

Young Wooldridge, LLP

- Steven M. Torigiani

Hanson Environmental

- Dr. Charles H. Hanson, Senior Fishery Biologist

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Prepared by:

RMC water and environment

WOODARD &CURRAN

2175 N. California Blvd
Suite 315
Walnut Creek, CA 94596
925.627.4100









